

زبان تخصصی

مهندسی برق

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مؤسسه آموزش عالی آزاد پارسه

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moving, because the motor is activated only when the foot is in the air. This ensures that it is not wasting energy by fighting against the runner's weight.

15 - The motor is activated ...

- 1) when the foot is in the air
- 2) to adjust the selected level
- 3) when the cord's tension is calculated
- 4) when the data is sent to an embedded 20-megahertz microprocessor in the shoe's arch

► Exercise 11 (CE 86)

It isn't just the technology that has changed. Digitization has altered the way we think about photography and photographs. Digital pictures have become malleable throwaways that we relentlessly save. My mother kept an old shoe box holding pictures from long ago. It was full of faded, sepia-toned, quite formal poses of solemn-faced people in stiff collars and long dresses. I don't know who the people were, and by the time I found the shoe box, sadly, there was no longer any way to find out. There were no captions - no tags or metadata, as we would say. Yet in some way, those curled and faded pieces of cardboard were more real than the thousands of vibrant displays of my own informal digital pictures that appear on my computer monitor today.

The trouble with digital photography begins with the mind-set that it's free, prompting us to take a multitude of thoughtless pictures. Then, because it's also free to save all the pictures, we fill up our disk drives with them, and the few good pictures that should be left to posterity are lost in a glut of trivia. Moreover, there are too many pictures to add captions or descriptions. Instead of a shoe box, I'm leaving a vast refuse pile where posterity will be reluctant to tread.

16 - According to the author, the posterity will react to the multitude of digital pictures left for them with...

- | | | | |
|-------------------|---------------|-------------|------------|
| 1) relentlessness | 2) reluctance | 3) gluttony | 4) refusal |
|-------------------|---------------|-------------|------------|

مقدمه

هدف از این مجموعه، ارتقاء مهارت داوطلبان ورود به مقطع کارشناسی ارشد در پاسخ‌گویی به سؤالات درس زبان تخصصی است. این درس بصورت یک مجموعه با ۳۰ سؤال به‌طور جداگانه به داوطلبان رشته مهندسی برق ارائه می‌شود.

داوطلب باید در مدت ۳۰ دقیقه به این سؤالات پاسخ دهد. به عبارت دیگر نمی‌توان این وقت را برای پاسخ‌دهی سایر دروس تخصصی داد. این امر اهمیت این درس را در آزمون کارشناسی نشان می‌دهد. از سوی دیگر ضریب بالای این درس و تعداد سؤالات زیاد آن اهمیت زبان تخصصی را دوچندان می‌کند.

برخلاف سایر کتب موجود که سعی در حل تست‌ها از روی ترجمه متون دارند، در این مجموعه سعی شده است که به کمک ارائه تکنیک‌های متداول خواندن و درک متن که در کتاب‌های TOEFL و IELTS آمده است به سؤالات آزمون کارشناسی ارشد پاسخ داده شود. این روش‌ها بصورت ۱۰ درس که هر کدام به یک موضوع خاص می‌پردازند ارائه شده است. در ابتدای هر درس سعی شده است که به کمک مثال‌هایی عمومی، موضوع مورد بحث تشریح شود. در انتهای این درس سؤالات مربوط به آزمون‌های پیش که مرتبط با درس مورد نظر هستند آورده شده است. با توجه به هماهنگی بودن آزمون‌های مربوط به رشته‌های برق، کامپیوتر و IT و نیز مرتبط بودن این رشته‌ها، سؤالات انتهایی دروس از این آزمون‌ها انتخاب شده‌اند که به ترتیب با علائم EE, CE, IT مشخص شده‌اند.

اگر چه این کتاب مبتنی بر ترجمه متون نیست اما به یادگیری کلمه (Vocabulary) تأکید دارد. برای همین منظور در قسمت دوم کتاب، ۱۰ درس که هر یک شامل ۲۰ لغت است با مثال‌های فنی آمده است. در بخش سوم به حل تشریحی تست‌های سال‌های ۸۵ تا ۸۸ آزمون‌های سراسری براساس دروس ارائه شده پرداخته‌ایم. همچنین برای آشنایی داوطلبان با نمونه آزمون‌های دانشگاه آزاد یک نمونه از این آزمون‌ها نیز در کتاب گنجانده شده است.

در انتها امیدوارم که این کتاب که حاصل تدریس چند ساله نگارنده در دانشگاه و نیز مؤسسات آمادگی کنکور ارشد است بتواند سهمی هر چند اندک در ارتقاء دانش فرزندان ایران داشته باشد. از همه خوانندگان بابت خطاهایی که پس از چندین بار ویرایش بر ما پوشیده مانده است عذرخواهی می‌کنیم و امیدواریم که ما را از رهنمودهایشان بی‌بهره نسازند.

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عضو هیأت علمی دانشگاه سمنان

دانشکده مهندسی برق و کامپیوتر

تابستان ۱۳۸۸

with their knees permanently bent in an awkward, constipated-looking manner. Their ability to climb stairs is the result of careful choreography and laborious mapping of the environment. The ZMP algorithm results in a motion that looks unnatural because it has no bearing upon how humans actually walk. While taking a step, it requires that the supporting foot is flat on the ground so that balances can be achieved by exerting forces through the ankle joint. A balance-of-forces calculation at the ankle joint determines the position of the shin, and the process is repeated at the knee to determine the position of the thigh and so on. The problem is that the complexity of the calculation grows in proportion with the cube of the number of joints in the robot, which quickly becomes computationally unwieldy. This will make life increasingly difficult for engineers in future as they attempt to add more complex behaviors to their robots' repertoires; this is why a new algorithm devised by Dr. Grizzle, called "hybrid zero dynamics" (HZD), is so clever. It simplifies the problem, producing reliable predictions for walking motions which can be applied across a range of robot designs. Dr. Grizzle designed his algorithm to work with robots that do not have feet or ankles, but simply have two rigid legs, like stilts. Together with Eric Westervelt, a doctoral student, he devised two simple equations. One describes the motion of any complex walking system as a form of inverted pendulum; the other describes how this inverted pendulum will move. The simplicity of these equations, and their ability to make very accurate predictions, ensure that the robot stays balance.

Remarkably, Dr. Grizzle does not have a robot of his own on which to test his algorithm. Instead, it was tested on a two-legged robot called Rabbit at the Laboratoire Automatique de Grenoble in France. Rabbit, it turns out, can walk and run, despite not having any feet. It can recover from being shoved, and can even carry a load equivalent to 30% of its own weight without much reprogramming.

14 - According to the passage, Dr. Grizzle and Eric Westervelt, his Ph.D. student, tested the algorithm on ...

- | | |
|----------|----------------------------------|
| 1) QRIO | 2) Rabbit |
| 3) Asimo | 4) their own robot called Rabbit |

► Exercise 10 (CE 85)

Are your running shoes too hard for running on asphalt? Too soft for a dirt track? No matter, because, according to Adidas-Salomon AG, in Herzogenaurach, Germany, the Adidas I running shoe will continually adjust the firmness of its heel to make sure it always feels right: softer on concrete, firmer on grass, for example.

The preferred firmness of a cushion in the heel is selected when you push either of two buttons on the side of the shoe, one carrying a plus sign, the other a minus. These in turn activate a motor that tightens or relaxes a steel cord to give the heel its variable firmness. Five light-emitting diodes on each shoe indicate the firmness levels. The hollow plastic cushion in the heel contains a Hall Effect sensor, which reads the strength of an electromagnetic field created by a magnet near the bottom of the heel. As the runner's foot strikes the ground and the plastic cushion is compressed, the sensor measures the change in field strength. It sends this data to an embedded 20-megahertz microprocessor in the shoe's arch, which calculates to within 100 micrometers just how much the cushion has been compressed, and adjusts the cord tension to maintain a constant level of firmness no matter what you're running on. This cycle of sensing, measuring, and adjusting happens 10000 times a second. You won't notice the cord's tension changing until you start

به نام خدا

هرگونه چاپ و تکثیر از محتویات این اثر بدون اجازه کتبی ناشر ممنوع است.
متخلفان به موجب بند ۵ از ماده ۲ قانون حمایت از مؤلفان و مصنفان و هنرمندان
تحت پیگرد قانونی قرار می گیرند.

کلیه حقوق مادی و معنوی این اثر متعلق به مؤسسه آموزش عالی آزاد پارسه است.

accounting data maintenance. Moreover, equalization on different charging schemes is also needed. This is because different billing schemes may be used for different types of services (e.g., charging can be based on data, time, or information). It is challenging to formulate one single billing method that covers all the billing schemes involved. Furthermore, 4G networks support multimedia communications, which consists of different media components with possibly different charging units. This adds difficulty to the task of designing a good charging scheme for all customers. Besides, the media components may have different QOS requirements. It is very complicated to decide a good tariff for all the possible components. In order to build a structural billing system for 4G networks, several frameworks have already been studied. The requirements on these frameworks include scalability flexibility, stability, accuracy, and usability.

In addition to terminal mobility, personal mobility is a concern in mobility management. Personal mobility concentrates on the movement of users instead of users' terminals, and involves the provision of personal communications and personalized operating environments. When there is a video message addressed to the mobile user, no matter where the user is located or what kind of terminal is being used, the message will be sent to the user correctly. A personalized operating environment, on the other hand, is a service that enables adaptable service presentations (in order to fit the capabilities of the terminals in use regardless of network types). Currently, there are several frameworks on personal mobility found in the literature. Mobile-agent-based infrastructure is one widely studied solution. In this infrastructure, each user is usually assigned a unique identifier and served by some personal mobile agents (or specialized computer programs running on some servers). These agents act as intermediaries between the user and the Internet. A user also belongs to a home network that has servers with the updated user profile (including the current location of the user's agents, user's preferences, and currently used device descriptions). When the user moves from his/her home network to a visiting network, his/her agents will migrate to the new network. When somebody makes a call request to a user, say Mary, the caller's agent first locates Mary's agent by making a location request to her home network. By looking up Mary's profile, her home network sends back the location of Mary's agent to the caller's agent. Once the caller's agent identifies Mary's location, the caller's agent can directly communicate with her agent. Different agents may be used for different services. A mobile agent-based infrastructure uses four assistants (user assistant, HTTP assistant, mail assistant, and FTP assistant) to personalize user operating environments. However, there are other personal mobility frameworks that do not rely on mobile agents.

13 - What activity is most closely related to personal mobility?

- | | |
|------------------------|------------------------|
| 1) Carrier of persons | 2) Location management |
| 3) Mobility management | 4) Terminal mobility |

► Exercise 9 (CE 85)

In recent years robots have gone through a rapid evolution: like their human creators, they have gone from crawling on the ground to walking upright on two legs. Indeed, the latest humanoid robots, such as Honda's Asimo and Sony's QRIO, can climb stairs, dance, run and jump. Even the most advanced robots, however, still cannot move the grace, agility and flexibility of a human .

The problem with current robots is the "zero-moment point" (ZMP) algorithm that controls them, says Jessy Grizzle of the University of Michigan in Ann Arbor. Although ZMP can produce some impressive results, its design requires a low center of gravity and flat feet, making it unable to emulate the speed and agility of a human gait or to cope with uneven surfaces. Both QRIO and Asimo walk in a crouched position,

are networked together, each simultaneously collects data from its immediate surroundings and passes its own and other motes' data through the network .

Though wireless sensor networks have been widely heralded for tracking everything from traffic to crops to people, their potential is still largely unrealized. While industry types figure out how sensor networks can boost their bottom line, and privacy advocates debate their social costs, researchers like Mainwaring are actually moving the technology out into the real world. Those efforts have transformed this tiny island and its petrels into a test bed for the future of sensing technology.

- 9 - What is the name of the Island discussed?
1) Leach 2) Great Duck 3) Bar Harbor 4) Mainwaring
- 10 - According to the passage, what do the film-canister-sized cylinders refer to?
1) Motes 2) Petrels
3) Data machines 4) Nothing special
- 11 - What are petrels?
1) Motes 2) Seabirds 3) Bird-watchers 4) Ornithologists

► *Exercise 7 (EE 85)*

For fault-finding you must have at least a multi meter, either analogue or digital. An oscilloscope is not absolutely essential but you will find yourself very restricted without one. It's like trying to repair a car while wearing a blindfold. For audio equipment, a signal source is needed. Clearly a function generator is useful but simpler and cheaper alternatives work well in most cases. You only need a fixed frequency source, say 400 or 1000Hz sine or square wave. For cassette recorders a tape with a constant 400Hz wave recorded on both channels is adequate for most fault-finding. However, for checking playback levels and frequency response and aligning the tape head, proper test tapes, which are expensive, are required. For serious work, a collection of test leads and audio connectors is essential. Most modern audio equipments use phono-sockets so it's worthwhile investing in cables which terminate in phono-plugs. For other types of sockets, adaptors are available.

12. What are phono-sockets associated with?
- 1) Adaptors
2) Tests leading to audio connectors
3) Cables which lead to phono-plugs
4) All of the above

► *Exercise 8 (EE 86)*

In today's mobile market, an operator usually charges customers with a simple billing and accounting scheme. A flat rate based on subscribed services, call durations, and transferred data volume is usually enough in many situations. However, with the increase of service varieties in 4G systems, more comprehensive billing and accounting systems are needed. Customers may no longer belong to only one operator, but instead subscribe to many services from a number of service providers at the same time. It may be very inconvenient for a customer to deal with multiple service providers. Instead, a brokering service can be provided. Customers do not have to waste time handling all the financial transactions involved. To achieve this, operators need to design new business architecture, accounting processes, and

Introduction

This book is designed to improve your reading comprehension skills by presenting standards techniques in 10 lessons. Although this book was written in a general form, it particularly focuses on *Master of Science entrance exam*. Therefore it can be used by both undergraduate students for their technical English course and the ones aim to pass this exam.

Unlike other books which try to answer reading questions by translating passages into Farsi, this manuscript is based on well-established techniques selected from standard TOEFL and IELTS books.

Each lesson focuses on a certain skill followed by various examples. Most of these examples were chosen from previous electrical, computer or IT exams, indicated by EE, CE and IT respectively. As you move through this book and your reading skills develop, the lessons and passages will increase both in complexity and in length. Although we do not translate passages, we emphasize on vocabulary. At the end of each lesson you learn 20 vocabulary explained by technical examples.

This book uses little icons to point out useful information of various types. They are as follows:



► The Tip icon points you to information that is interesting and can save you time.



► If you don't notice these little icons, you might regret it. Warnings alert you to problems that are error prone and you should avoid them.



► Remember icons remind you of an important idea or fact that you should keep in mind. They might even point you to another chapter for more in-depth information about a topic.

Dr Saeed Mozaffari

7 _ What is an IP address according to the above passage?

- | | |
|----------------------------|---------------------------|
| 1) It's a unique number | 2) It's a unique protocol |
| 3) It's a permanent number | 4) All of the above |

► *(Exercise 5 (CE 84))*

While film used in cinema contains pigments that can create an infinitely large number of color variations, TV sets combine discrete amounts of red, green, and blue light to create a much more limited color range. To produce more colors, TV sets would have to combine purer, or more saturated, red, green, and blue by using narrowband light filters that select colors more precisely but diminish brightness at the same time.

Genoa Color Technologies Ltd. has developed the software and hardware necessary to close this gap and make TV images more cinema-like without the unwanted dimming side effect. The trick is to add extra primaries, the basic colors that, combined, form all others. By adding yellow and cyan (a light blue) to the standard red, green, and blue, a display that could normally generate about 16.7 billion colors would now be able to show more than one trillion.

Genoa has developed a color conversion algorithm that runs in a special microchip to be added to a television's imaging circuit. The algorithm gets a color value - from a DVD, for example, that the television would originally exhibit as a combination of three primaries - and finds how to best represent it as a combination of five primaries.

8 _ What is meant by the "primaries" as stated in the passage?

- | | |
|--------------------------------------|---|
| 1) The basic colors | 2) Yellow and cyan colors |
| 3) The trick to generate more colors | 4) The standard red, green, and blue colors |

► *(Exercise 6 (EE 84))*

Each cylinder holds a bit circuitry capable of simple computation and communication, plus a few environmental sensors, a battery, and an antenna. Taken alone, it's nothing special. But scatter around a dozen or a hundred or a thousand of these film-canister-sized cylinders - called motes - and switch them on, and something amazing happens: within seconds, they will organize themselves into a powerful yet stealthy data-gathering machine. Their quarry: a small and secretive seabird known as Leach's storm petrel, whose comings and goings bird-watchers have long puzzled over but have never fully understood .

It seems an unlikely spot for such a setup, out here on the shore of nowhere, but in certain circles, the goings-on at Great Duck are being closely watched. Mainwaring is a computer scientist at the Intel Research Laboratory in Berkeley, Calif., and together with a longtime friend, John Anderson, an ornithologist at the College of the Atlantic, Bar Harbor, has spent the last three years conducting one of the most sophisticated tests of wireless sensor networks yet devised.

The petrel-watching apparatus consists of a distributed system of motes, each having the dual functions of data collection and communication. For the former role, the mote contains application-specific sensors and signal-processing hardware; for the latter, the mote has a low-power radio transceiver. When the motes

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5 - At which layer of atmosphere ionization results from ultra violet light?

- 1) Low layers of the atmosphere
- 2) Only the E layer of the atmosphere
- 3) High layers of atmosphere including the E and F layers
- 4) Medium layers of the atmosphere including the D layer

6 - F Layer remains over night because....

- | | |
|-----------------------------------|---|
| 1) source of radiation is removed | 2) longer recombination process takes place |
| 3) air density is so much high | 4) 2 and 3 |

► Exercise 4 (CE 86)

As the Internet rapidly becomes the way to communicate, cyberspace is getting crowded. Millions of computers and networks effortlessly exchange vast amounts of information using the Internet Protocol. Yet IP has a shortcoming. Each networked device needs to have a unique number to distinguish it from every other device on the Internet. Otherwise, your e-mail, Web pages, instant messages, and the like might be delivered to someone else's computer on the other side of the world. Unfortunately, the Internet is running out of these numbers.

Each unique number is known as an IP address, and in the IP scheme that runs today's Internet - known as the IPv4, for Internet Protocol version 4 - each address is stored in 4 bytes and is a 32-bit binary number. This means there are 232, or just over 4 billion, unique numbers available. Unfortunately, there are already more than 6 billion people on Earth, and although not everyone has an Internet-connected computer, the rest of us are making up for them with our servers, personal computers, PDAs, mobile phones and so on. And even in poorer regions of the world, Internet use is exploding. The day will come when the world simply runs out of IPv4 addresses. And that's only one of the ways in which IPv4 is falling behind the times. IPv4 calls for very little in the way of security standards, which is one of the reasons security on the Internet is tough to enforce. IPv4 has very little support for real-time applications - telephony, videoconferencing, online games, live sports-watching, and so on - that do not tolerate transmission lags of even a few hundred milliseconds. Although such services are available today, reliability is not guaranteed, so dropped or stuttering connections are common.

Fortunately, there's an alternative: Internet Protocol version 6 (IPv6), which boosts the number of addresses up to 2128. This number is so large that there are no words to describe it, but by one estimate there would be more than 2000 addresses for every square meter on Earth. Besides providing more addresses, IPv6 offers greater security (for example, mandatory use of IPsec), and it has features that improve real-time applications. However, migrating the Internet to IPv6 is proving to be painfully slow. Originally, that was because it took a long time for computer scientists and engineers to hammer out the details. During that initial delay, a stopgap, called Network Address Translation (NAT), did such a good job of relieving the need for more IP addresses that it has become a permanent part of the IPv4 landscape. And it lets the administrators of the world's biggest networks continue to put off the dreary task of changing over to IPv6.

Lesson 1

General Considerations

Before starting the techniques, we should know more about this exam. Let us explore the following questions:

► Why technical English is important in MSc. entrance exam?

There are some factors which make a course more important than the others in entrance exam. They are as follows:

☒ Coefficient:

Some courses like *Circuit Theory* or *major* course have high coefficient (for example 4 or 5). *Technical English* coefficient is 3 similar to *minor* courses. Therefore it has a vital role in this exam.

☒ Number of questions:

Number of question is another criterion. Courses with more questions are more uniform and you can get better scores in them. With 25 to 30 questions, technical English has the most questions in our exam. Other courses have 20 to 15 questions.

☒ Different level of knowledge among students:

Students usually have the same ability in fundamental courses like *Circuit Theory*. But our experience showed that their skill in technical English is very diverse.



It is exactly where you can overtake the others.

civilian robotic surgery market: Computer Motion, in Goleta, Calif., and Intuitive Surgical, in Sunnyvale, California.

In 2001, Jacques Marescaux, a surgeon at the University of Strasbourg, in France, worked with Computer Motion to modify its system and perform the first remote surgery on a human patient, a gallbladder removal procedure called laparoscopic cholecystectomy. Using a dedicated high-speed connection, Marescaux controlled the robot from New York City while the patient lay in an operating room in Strasbourg.

In 2003, a lengthy patent litigation ended with the merger of Computer Motion and Intuitive Surgical. Under the name of Intuitive Surgical, the merged company is now the only one to commercialize a robotic surgical system approved by the US Food and Drug Administration. The FDA-approved procedures include general laparoscopic surgery, chest surgery, certain cardiac procedures, and urological and gynecological procedures.

3 - On which human organ was the first remote surgery performed?

1) Chest

2) Gallbladder

3) Heart

4) Kidney

4 - When the first remote surgery was performed on a human patient? (author)

1) 1990

2) 2000

3) 2001

4) 2003

► Exercise 3 (EE 86)

The ionization in the ionosphere is generated when radiation from the sun strikes the gas molecules in the upper atmosphere. The radiation is of sufficient intensity that it gives the electron in some molecules sufficient energy to leave the molecular structure. This leaves a free electron and the gas molecule, having one electron too few becomes a positive ion. At very high altitudes the atmosphere is very thin, and as a result the levels of ionization are very low. As the atmosphere become denser, so the level of ionization starts to rise. However the ionization process uses up the energy of the radiation, and after a certain distance the energy of the radiation is such that it does not ionize as many gas molecules as before and the level of ionization begins to fall. It is also found that for the higher layers including the F and E layers most of the ionization results from ultra violet light. The D layer being at a lower altitude results mainly from X rays that are able to penetrate further into the atmosphere.

It is also found that the free electrons and positive ions slowly recombine. In other words the radiation is causing them to ionize, and then they slowly recombine afterwards. In chemistry this state of affairs is called a dynamic equilibrium. It means that if the source of radiation is removed, then the levels of ionization will fall. As a result the D layer disappears after nightfall, and the E layer is greatly reduced in intensity. In view of the high levels of ionization in the F layer and the fact that the air density is so much less, it takes longer for the recombination process to take place and consequently it remains over night, although its level is reduced.

☒ Separate time to answer:

This is the most important factor which makes technical English so important. Technical English is given in a separate notebook at the begging of the exam.



You can not allocate its time to any other courses.

► Which language skills are tested on this exam?

We have six different skills in each language which are listed below. However, in this exam only the first three will be asked. Table 1 shows number of questions in each section.

- ☒ Reading comprehension
- ☒ Vocabulary
- ☒ Grammar and structure
- ☒ Speaking
- ☒ Listening
- ☒ Writing

Table.1

Year	Reading	Vocabulary	Grammar
before 87	25	0	0
After 87	15	10	5

► How long is the technical English session?

(The total time for technical English session is 25-30 minutes. In the other words, you have one minute for each test. This is the most challenging part. A good student is expected do read effectively and manages his time.



Nonstandard methods such as *translation* are absolutely useless.

► How do designers prepare technical English tests?

(For grammar and vocabulary sessions there are several standard reference books such as grammar in use, grammar essential, essential words for TOEFL, and 504 words.

However for reading comprehension part there is not such good text books. You may think of two different approaches for reading tests design:

phase with the reference wave. The amount by which it is out of phase depends precisely on where it strikes the object.

The two out-of-phase light waves create an interference pattern on the film. And this interference pattern contains all of the information needed to re-create a high-resolution image of the object when a third light wave strikes the hologram at the same angle as the reference wave that helped to create it. In most holograms, white light, typically from a halogen bulb, rather than laser light, is used to re-create the image. To create the superposition of the two images, Bauhaus University researchers mainly use three pieces of equipment: an autostereoscopic display, which allows viewing of 3-D graphics without the use of special glasses; a white-light hologram; and a digital projector, such as one used to display presentations stored on a computer onto a larger screen.

The autostereoscopic display shows images of 3-D graphics through a plastic sheet of tiny lenses that direct a different image to each eye. The holographic film is directly attached to the front of the display screen. When the digital projector illuminates the hologram, the recreated 3-D images from the hologram and the display appear to the viewer in the same volume of space. The power of the technique comes from the ability to control the direction and intensity of the light from the digital projector, and thus to control which parts of the hologram are re-created and which are not.

1 - What is meant by the reference wave?

- 1) Laser light
- 2) The light wave that falls directly onto the film
- 3) The third light wave that strikes the hologram
- 4) The light wave that illuminates the object to be imaged

2 - What are the principal tools used to create the image discussed in the passage?

- 1) An autostereoscopic display, tiny lenses, and a digital projector
- 2) An autostereoscopic display, a large screen, and a digital projector
- 3) An autostereoscopic display, special glasses, and a digital projector
- 4) An autostereoscopic display, a white-light hologram, and a digital projector

► Exercise 2 (EE 86)

A few months ago Timothy Broderick, a professor of surgery and biomedical engineering at the University of Cincinnati, chose an unusual place for an experiment in surgical robotics. As part of the NASA Extreme Environment Mission Operations, or NEEMO project, he headed out to the Aquarius habitat, located 19 meters underwater off Key Largo, Florida, and in a cramped laboratory he set up an experimental two-armed surgical robot.

Broderick requested the help of another surgeon, Mehran Anvari of McMaster University, in Hamilton, Ont., Canada, who controlled the robot from his office 2000 kilometers to the north. Despite a delay of up to 2 seconds, Anvari was able to successfully simulate complex surgical tasks, such as suturing a vein on a latex anatomical model. The surgical robot used by Broderick and Anvari was a modified version of a system originally developed in the early 1990s by Phil Green, a researcher at SRI International, for the U.S. military. The highly influential SRI project encouraged the start-up of two companies to address the

☑ Writing *both* passages and questions.

☑ Writing *only* questions for original passages.

Test designers select original passages written by native writers from different academic resources. Then they design tests for these passages. These articles usually have difficult structures and they are full of advanced vocabularies. They talk about new technological topics.

► Where these passages would most probably selected from?

(Original passages usually selected from IEEE journals and magazines, academic research web sites and some news agencies.



Unlike basic topics, you probably do not have any background on them.

(What will you learn in this book?

(You will learn various reading comprehension techniques that help you to read more effectively.

(You will learn 200 vocabularies with technical examples.

(You will apply these reading techniques and vocabularies to solve previous exams.

(What should you do for further reading?

(After reading these techniques and using them to solve EE tests, we recommend you to read CE or IT exams.

► Pretest

Before you start your study of reading skills, you may want to get an idea of how much you already know and how much you need to learn. If that's the case, take the pretest that follows.

The pretest consists of 25 multiple-choice questions selected from previous exams. Naturally, 25 questions can't cover every single concept or strategy you will learn by working through this book. So even if you get all the questions on the pretest right, it's almost guaranteed that you will find a few ideas or reading tactics in this book that you didn't already know. On the other hand, if you get many questions wrong on this pretest, don't despair. This book will show you how to read more effectively, step by step. There's an answer sheet you can use for filling in the correct answers on page 5. We will discuss this test in more details later.

► Skimming

When you are skimming, move your eyes quickly over the text or passage and ask yourself "What is this passage about?" Look at the important parts of the passage: the beginning, the end, the titles and the first sentence in each paragraph (if there is more than one), which usually contains the main idea.

► Scanning

When you are scanning move your eyes quickly over the passage until you find the specific pieces of information, a date, a figure, a name that you need. It is not necessary to read the whole passage carefully.



At least you can answer 30 percent of the questions by skimming and scanning.



Because of the frequent use of long passages in recent exams, skimming and scanning techniques play more vital role in today exams.

Read the following passages very quickly. Do not read every word carefully. Then answer their corresponding questions.

► Exercise 1 (EE 85)

The beauty of three-dimensional graphics packages used by engineers and scientists is that viewer can not only see an image in depth from different angles but can also manipulate it with software. The resolution of the image, however, is limited to the resolution of the graphics program, or of the screen on which the graphics are viewed - which is typically megapixels at most. Holograms, on the other hand, can contain terapixels of data and are inherently 3-D. But because these holographic images are fixed in the holographic film, the viewer cannot manipulate the image or interact with it, except to view it from different angles. But now, a research group at the Bauhaus University in Weimar, Germany, has developed a method for combining the interactivity of computer graphics with the data richness of the hologram by superimposing the holographic image and the 3-D graphics image. To understand how the Bauhaus University's method works, consider how a hologram is made and how it re-creates a 3-D image of an object. To make a hologram, laser light is split into two light waves that are initially in phase. One of waves illuminates the object to be imaged, and the light reflected from the object travels to a holographic film. The second light wave, the reference wave, falls directly onto the film. Because the distance that the first light wave travels varies according to where it strikes the object, it will generally arrive at the film out of

Passage 1

Central to an autonomous entity are the rules of behavior governing how it must act or react to the information collected by the detector from the environment and its neighbors. These rules determine into what state the entity should change and also what local knowledge should be released via the effectors to the environment.

In order to adapt itself to a problem without being explicitly told what to do in advance, an autonomous entity must modify the rules of its behavior over time. This ability, responding to local changing conditions, is known as the individual's learning capability. Worth noting is that randomness plays a part in the decision making process of an autonomous entity despite the presence of a rule set. It allows an autonomous entity to explore uncharted territory despite evidence that it should exploit only a certain path. On the other hand, randomness helps the entity resolve conflict in the presence of equal support for suggestions to act in different ways in its own best interests and avoid being stuck by randomly choosing an action in local optima.

The environment acts as the domain in which autonomous entities are free to roam. This is a static view of the environment. The environment of a NIC (Nature-Inspired Computing) system can also act as the "noticeboard" where the autonomous entities post and read local information. In this dynamic view, the environment is constantly changing.

- 1 - If the individual's learning capacity is not high enough, an autonomous entity ...
 - 1) cannot adapt itself to a problem
 - 2) can respond to local changes
 - 3) modifies the rules of its behavior
 - 4) should be told what to do in advance
- 2 - Randomness being a part of decision making process...
 - 1) leads to confusion because of the presence of a rule set
 - 2) cannot work in the presence of a rule set
 - 3) allows the autonomous entity to explore unknown areas but helps it resolve possible conflicts
 - 4) helps the autonomous entity to follow a pre-arranged path

Passage 2

Forward-looking electromechanical applications require more sophistication and flexibility from both the hardware and software points of view. Many features which were considered luxury items in a product just a few years ago have now become standard items. This reality has led to new requirements for system design. The integration of design and control becomes even more relevant in the systems approach. These are important aspects not only for industrial research and development personnel but also for academicians. The specific application often dictates the system design requirements and control system characteristics. The applications considered emphasize the demand for high-performance systems which has introduced an increasingly challenging system design problem. These systems involve multi-energy domains, exhibit significant dynamic changes, and operate in environments where unpredictable disturbances are possible.

The applications discussed in this paper include robot manipulators, high-speed and high-precision magnetic bearing systems, atomic resolution systems, and their control using digital signal processing boards. In general, the design procedure involves the integration of design and control. Analytical and graphical descriptions for modeling physical dynamic systems are necessary for such integration. Graphical descriptions, such as the bond graph representation, can provide techniques for modifying system

Lesson 2

Getting the Essential Information

Imagine an amateur student who is asked to answer a question located in the third paragraph of a passage.

► What does he do?

☑ He slowly reads the passage from the first paragraph until the third paragraph with the same speed.

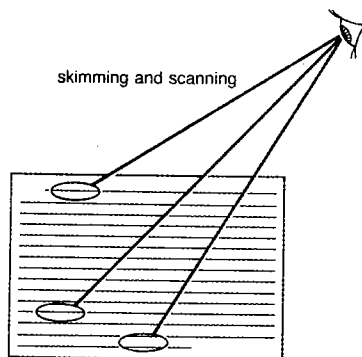
Now, let's do the same experience with a more experienced student.

(What is the difference between these two?)

(Since the second student is more experienced, he reads the first two paragraphs very fast to reach the answer in the third paragraph. Then, he reads this part very carefully even for several times. This method is called scanning.

To answer reading questions more effectively in a limited given time, it is necessary to know reading strategies. Skimming and scanning are two very useful techniques that will help you become a better reader.

When we are *skimming* we go through a passage quickly, jumping over parts of it, in order to get a general idea of what it is about. When we are *scanning*, we look through a text quickly in order to find a specific piece of information . When we are given a text, we may use both these techniques. First, we may skim through the article to get a general idea, or perhaps to see if it is of interest to us. Then, we may scan the article to take note of a particular name or a piece of information we need or want to remember.



characteristics, leading to proper system designs. These fundamental concepts are applicable to single and multi-energy domain systems. These systems include one or more of the following energy domains: electrical, mechanical, magnetic, chemical, and thermo-fluidic. System design of engineering systems requires a clear understanding of the system dynamic behavior and the performance specifications sought. This in turn implies the need for predicting the system behavior with and without a control system.

3 - Which of the following are needed for proper system design of forward-looking electromechanical applications?

- | | |
|---|---|
| 1) Analytical and graphical descriptions | 2) Disintegration of design and control |
| 3) Environments with unpredictable disturbances | 4) Use of analog signal processing boards |

4 - Based on the text, what is most relevant in the systems approach?

- | | |
|---|---------------------------------|
| 1) A clear understanding of system dynamics | 2) Combining design and control |
| 3) Knowledge of performance specifications | 4) Predicting system behavior |

Passage 3

MEMS (Micro-Electro-Mechanical Systems) and Nano devices are extremely small - for example, MEMS and Nanotechnology has made possible electrically-driven motors smaller than the diameter of a human hair - but MEMS and Nanotechnology is not primarily about size. It is also not about making things out of silicon, even though silicon possesses excellent materials properties, which make it an attractive choice for many high-performance mechanical applications; for example, the strength-to-weight ratio for silicon is higher than many other engineering materials which allows very high-bandwidth mechanical devices to be realized. Instead, the deep insight of MEMS and Nano is as a new manufacturing technology, a way of making electromechanical systems using batch fabrication techniques similar to those used for integrated circuits, and uniting these electromechanical elements with electronics.

MEMS and Nanotechnology are extremely diverse technologies that can significantly affect every category of commercial and military product. They are already used for tasks ranging from in-dwelling blood pressure monitoring to active suspension systems for automobiles. Their nature and diversity of useful applications make it potentially a far more pervasive technology than even integrated circuit microchips. Historically, sensors and actuators are the most costly and unreliable part of a macro-scale sensor-actuator-electronics system. However, MEMS and Nanotechnology allows these complex electromechanical systems to be manufactured using batch fabrication techniques increasing the reliability of the sensors and actuators to equal those of integrated circuits at a much lower cost.

MEMS are the integration of mechanical elements, sensors, actuators, and electronics on a common silicon substrate through microfabrication technology. While the electronics are fabricated using integrated circuit (IC) process sequences, the micromechanical components are fabricated using compatible "micromachining" processes that selectively etch away parts of the silicon wafer or add new structural layers to form mechanical and electromechanical devices. MEMS can revolutionize nearly every product category by bringing together silicon-based microelectronics with micromachining technology, making possible the realization of complete systems-on-a-chip. It is an enabling technology allowing the development of smart products, augmenting computational ability of microelectronics with the perception

FTP assistant) to personalize user operating environments. However, there are other personal mobility frameworks that do not rely on mobile agents.

23 - Which choice is closer to the passage?

- 1) Agents in a mobile agent-based infrastructure belong to one network
- 2) In video message transmission, the person's location is an important issue
- 3) In a mobile agent-based infrastructure, agents of users communicate with each other directly all the time
- 4) In a mobile agent-based infrastructure, communication is done by agents

24 - According to the passage, which statement is correct?

- 1) In 4G, all media have the same tariff
- 2) Creating one billing system for all of communication systems is not easy because there are varying services
- 3) A simple billing system suffices for 4G
- 4) An exact billing system is required only for multimedia

25 - What activity is most closely related to personal mobility?

- 1) Carrier of persons
- 2) Location management
- 3) Mobility management
- 4) Terminal mobility

and control capabilities of micro-sensors and micro-actuators and expanding the space of possible designs and applications.

5 - What are the strong points of MEMS and Nanotechnology?

- 1) Low cost and computational ability
- 2) High ability and excellent materials properties
- 3) Small size and computational ability
- 4) Small size, computational ability, and low cost

6 - Where are MEMS manufactured on?

- 1) On a chip
- 2) On suspension systems for automobiles
- 3) On a silicon wafer
- 4) On motors smaller than the diameter of human hair

7 - How are MEMS manufactured?

- | | |
|-----------------------------------|-----------------------------------|
| 1) By integrated circuits | 2) By micromachining technology |
| 3) By microelectronics technology | 4) By microfabrication technology |

Passage 4

Face recognition technology that could revolutionize security systems worldwide has been developed by computer scientists at Sheffield Hallam University. The new specialist software can produce an exact 3D image of a face within 40 milliseconds. Other 3D systems that have been trailed have proved unworkable because of the time it takes to construct a picture and an inaccurate result. The groundbreaking invention, by experts in the University's Materials and Engineering Research Institute (MERI), was tested by Home Secretary Charles Clarke on a recent visit to Sheffield. It could be used for tighter security in airports, banks, and government buildings and ID cards.

The breakthrough comes days after members of parliament (MPs) backed the compromise plans for identity cards, meaning from 2008 people applying for a new passport will also get an identity card, with their biometric details stored on a central register. The new technology works by projecting a pattern of light onto the face, creating a 2D image, from which 3D data is generated. Biometric features are extracted by a "parameterization" process, giving a digital mapping of a face that would form part of a fool-proof security system.

It is said that, this technology could be used wherever there is a need for heightened security. It is well suited to a range of applications including person identification from national databases, access control to public and private locations, matching 3D poses to 2D photographs in criminal cases, and 3D facial biometric data for smart cards such as ID and bank cards. We have developed a viable, working system at the cutting edge of 3D technology.

8 - The previous software for 3D face recognition was unworkable because it was ...

- | | |
|------------------------|------------------------|
| 1) fast | 2) slow |
| 3) slow and inaccurate | 4) fast but inaccurate |

9 - In the new technology discussed in the passage, 3D data is generated from

- | | |
|-----------------------|--------------------|
| 1) 2D image | 2) light patterns |
| 3) biometric features | 4) digital mapping |

22 - On which human organ was the first remote surgery performed?

1) Chest

2) Gallbladder

3) Heart

4) Kidney

Passage 8

In today's mobile market, an operator usually charges customers with a simple billing and accounting scheme. A flat rate based on subscribed services, call durations, and transferred data volume is usually enough in many situations. However, with the increase of service varieties in 4G systems, more comprehensive billing and accounting systems are needed. Customers may no longer belong to only one operator, but instead subscribe to many services from a number of service providers at the same time. It may be very inconvenient for a customer to deal with multiple service providers. Instead, a brokering service can be provided. Customers do not have to waste time handling all the financial transactions involved. To achieve this, operators need to design new business architecture, accounting processes, and accounting data maintenance. Moreover, equalization on different charging schemes is also needed. This is because different billing schemes may be used for different types of services (e.g., charging can be based on data, time, or information). It is challenging to formulate one single billing method that covers all the billing schemes involved. Furthermore, 4G networks support multimedia communications, which consists of different media components with possibly different charging units. This adds difficulty to the task of designing a good charging scheme for all customers. Besides, the media components may have different QOS requirements. It is very complicated to decide a good tariff for all the possible components. In order to build a structural billing system for 4G networks, several frameworks have already been studied. The requirements on these frameworks include scalability flexibility, stability, accuracy, and usability.

In addition to terminal mobility, personal mobility is a concern in mobility management. Personal mobility concentrates on the movement of users instead of users' terminals, and involves the provision of personal communications and personalized operating environments. When there is a video message addressed to the mobile user, no matter where the user is located or what kind of terminal is being used, the message will be sent to the user correctly. A personalized operating environment, on the other hand, is a service that enables adaptable service presentations (in order to fit the capabilities of the terminals in use regardless of network types). Currently, there are several frameworks on personal mobility found in the literature. Mobile agent-based infrastructure is one widely studied solution. In this infrastructure, each user is usually assigned a unique identifier and served by some personal mobile agents (or specialized computer programs running on some servers). These agents act as intermediaries between the user and the Internet. A user also belongs to a home network that has servers with the updated user profile (including the current location of the user's agents, user's preferences, and currently used device descriptions). When the user moves from his/her home network to a visiting network, his/her agents will migrate to the new network. When somebody makes a call request to a user, say Mary, the caller's agent first locates Mary's agent by making a location request to her home network. By looking up Mary's profile, her home network sends back the location of Mary's agent to the caller's agent. Once the caller's agent identifies Mary's location, the caller's agent can directly communicate with her agent. Different agents may be used for different services. A mobile agent-based infrastructure uses four assistants (user assistant, HTTP assistant, mail assistant, and

10 - The new technology could be used for

- | | |
|--------------------------|-------------------------------------|
| 1) access control | 2) identification in criminal cases |
| 3) person identification | 4) all of the above |

Passage 5

The ionization in the ionosphere is generated when radiation from the sun strikes the gas molecules in the upper atmosphere. The radiation is of sufficient intensity that it gives the electron in some molecules sufficient energy to leave the molecular structure. This leaves a free electron and the gas molecule, having one electron too few becomes a positive ion. At very high altitudes the atmosphere is very thin, and as a result the levels of ionization are very low. As the atmosphere become denser, so the level of ionization starts to rise. However the ionization process uses up the energy of the radiation, and after a certain distance the energy of the radiation is such that it does not ionize as many gas molecules as before and the level of ionization begins to fall. It is also found that for the higher layers including the F and E layers most of the ionization results from ultra violet light. The D layer being at a lower altitude results mainly from X rays that are able to penetrate further into the atmosphere.

It is also found that the free electrons and positive ions slowly recombine. In other words the radiation is causing them to ionize, and then they slowly recombine afterwards. In chemistry this state of affairs is called a dynamic equilibrium. It means that if the source of radiation is removed, then the levels of ionization will fall. As a result the D layer disappears after nightfall, and the E layer is greatly reduced in intensity. In view of the high levels of ionization in the F layer and the fact that the air density is so much less, it takes longer for the recombination process to take place and consequently it remains over night, although its level is reduced.

11 - At very high altitudes of the atmosphere the level of ionization is low because...

- | | |
|----------------------------------|-----------------------------------|
| 1) atmosphere is dense | 2) atmosphere is not dense |
| 3) radiation from the sun is low | 4) radiation from the sun is high |

12 - At which layer of atmosphere ionization results from ultra violet light?

- 1) Low layers of the atmosphere
- 2) Only the E layer of the atmosphere
- 3) High layers of atmosphere including the E and F layers
- 4) Medium layers of the atmosphere including the D layer

13 - F Layer remains over night because....

- | | |
|-----------------------------------|---|
| 1) source of radiation is removed | 2) longer recombination process takes place |
| 3) air density is so much high | 4) 2 and 3 |

Passage 6

WiMedia, the next generation of wireless connectivity, is raising some interesting questions about privacy.

WiMedia, which underlies consumer technologies such as Certified Wireless USB and the planned next iteration of Bluetooth, is based on the concept of ultrawideband radio. It uses short-range, very-low-power signals transmitted across a vast expanse of the radio spectrum - from 3.1 to 10.6 GHz. Traditional radio, on the other hand, uses a much higher-power signal across a narrow band of spectrum.

Passage 7

A few months ago Timothy Broderick, a professor of surgery and biomedical engineering at the University of Cincinnati, chose an unusual place for an experiment in surgical robotics. As part of the NASA Extreme Environment Mission Operations, or NEEMO project, he headed out to the Aquarius habitat, located 19 meters underwater off Key Largo, Florida, and in a cramped laboratory he set up an experimental two armed surgical robot.

Broderick requested the help of another surgeon, Mehran Anvari of McMaster University, in Hamilton, Ont., Canada, who controlled the robot from his office 2000 kilometers to the north. Despite a delay of up to 2 seconds, Anvari was able to successfully simulate complex surgical tasks, such as suturing a vein on a latex anatomical model. The surgical robot used by Broderick and Anvari was a modified version of a system originally developed in the early 1990s by Phil Green, a researcher at SRI International, for the U.S. military. The highly influential SRI project encouraged the start-up of two companies to address the civilian robotic surgery market: Computer Motion, in Goleta, Calif., and Intuitive Surgical, in Sunnyvale, California.

In 2001, Jacques Marescaux, a surgeon at the University of Strasbourg, in France, worked with Computer Motion to modify its system and perform the first remote surgery on a human patient, a gallbladder removal procedure called laparoscopic cholecystectomy. Using a dedicated high-speed connection, Marescaux controlled the robot from New York City while the patient lay in an operating room in Strasbourg.

In 2003, a lengthy patent litigation ended with the merger of Computer Motion and Intuitive Surgical.

Under the name of Intuitive Surgical, the merged company is now the only one to commercialize a robotic surgical system approved by the US Food and Drug Administration. The FDA-approved procedures include general laparoscopic surgery, chest surgery, certain cardiac procedures, and urological and gynecological procedures.

18 _ Under whose control, with what, and in which state was the experimental surgery mentioned in the above passage performed?

- 1) Jacques Marescaux, surgical robot, France
- 2) Mehran Anvari, a two armed robot, Florida
- 3) Phil Green, surgical robot, Florida
- 4) Timothy Broderick, a two armed robot, Canada

19 _ Which country was the pioneer in performing the remote surgery?

- 1) France
- 2) Canada
- 3) U.s.A.
- 4) None of the above

20 _ Who originally developed the remote surgery system?

- 1) Jacques Marescaux
- 2) Mehran Anvari
- 3) Phil Green
- 4) Timothy Broderick

21 _ Under what circumstances was the experimental remote surgery performed?

- 1) In an inconvenient, uncommon condition
- 2) In an operating room in Strasbourg
- 3) In cooperation with Computer Motion and Intuitive Surgical
- 4) With a high speed connection

In the United States, the authority to regulate use of the radio spectrum falls to the Federal Communications Commission (FCC). U.S. courts have consistently ruled that the federal government has the power to regulate the airwaves, because radio is interstate commerce. But can the FCC really claim jurisdiction over the minuscule power levels used by WiMedia radios?

The answer to the question is important because the FCC restricts what radio broadcasters, whether licensed (as in the case of radio or TV stations) or unlicensed (as in the case of the millions of people who own Wi-Fi base stations), can do. On many licensed radio services, encryption is not allowed, as a condition of licensing. Amateur radio operators, for example, have never been allowed to send encrypted traffic; they would lose their licenses if they did.

In contrast, concerned that users be able to trust their own wireless systems, the coalition of electronics companies behind WiMedia - the WiMedia Alliance - demands that all ultrawideband radio systems sold under the WiMedia banner be capable of strong hardware encryption and that for some applications, using this encryption capability be mandatory.

So far, FCC regulations that deal with ultrawideband technologies have made no mention one way or the other of the use of encryption. But could the federal government use the authority of the FCC to enforce a law requiring that all ultrawideband transmissions be in the clear? It's not such a preposterous idea: the government's hostility to encryption was demonstrated in the 1990s, when it tried to restrict the use of Internet-based encryption technologies. In the end, the borderless nature of the Internet caused the government to admit defeat. There is no such obstacle to controlling low-power radio, however.

14 - What is meant by WiMedia?

- 1) WiMedia is the next generation of wireless connectivity based on the concept of ultrawideband radio
- 2) Wi Media is the next generation of wireless connectivity that is banned by the FCC
- 3) WiMedia is the next generation of wireless connectivity that uses high power signal across the radio spectrum
- 4) WiMedia is the next generation of wireless connectivity contradicted by the FCC

15 - What is the constraining factor that FCC imposes upon radio broadcasters?

- 1) Encryption is mandatory
- 2) Encryption technologies to be licensed
- 3) Encryption is not authorized
- 4) Licenses to be obtained

16 - In what category does the power of FCC lie?

- 1) Power to regulate use of the radio spectrum
- 2) Power to provide services for radio broadcasters
- 3) Power to restrict broadcasters
- 4) Full jurisdiction over the airwaves to regulate use of the radio spectrum

17 - By reading the above passage, which of the following statements would best explain what the passage reveals?

- 1) FCC may not have full authority over the users but it is successful in restricting encryption
- 2) FCC has full authority and is capable of banning encryption
- 3) FCC's authority is undeniable and can be an obstacle in controlling low-power radio
- 4) None of the above



Other forms of finding the main ideas are as follows:

- What does the author mainly discuss (or talk about)?
- What is the main idea behind the above text?
- Which of the following may best reveal the theme (or gist) of the passage?



Sentences which actually contain the main idea are called topic sentences. It is a help to be able to recognize the indicators which show the function of the other sentences that develop the topic sentence. Some indicators are:

- For example....
- An example/illustration/instance of this is.....
- Thus/consequently/as a result,...
- One result of this is, ..
- In addition/furthermore/moreover/ also...
- The reason for this is that
- Because of ...
- This is because
- Due to/owing to



There's a difference between the subject of a piece of writing and its main idea. To see the difference, look at the given passage.

► **Example 1:** Today's postal service is more efficient and reliable than ever before. Mail that used to take months to move by horse and foot now moves around the country in days or hours by truck, train, and plane.

First-class mail usually moves from New York City to Los Angeles in three days or less. If your letter or package is urgent, the U.S. Postal Service offers Priority Mail and Express Mail services. Priority Mail is guaranteed to go anywhere in the United States in two days or less. Express Mail will get your package there overnight.

☑ You might be asked on a standardized test, "What is the main idea of this reading?" For this passage, you might be tempted to answer: "the post office." But you'd be wrong.

This passage is about the post office, yes—but "the post office" is not the main idea of the passage. "The post office" is merely the subject of the passage (who or what the passage is about). The main idea must

te

A series of horizontal dotted lines for writing, organized into three groups of ten lines each, separated by small gaps.

say something about this subject. The main idea of a text is usually an assertion about the subject. An assertion is a statement that requires evidence ("proof") to be accepted as true.

The main idea of a passage is an assertion about its subject, but it is something more: It is the idea that also holds together or controls the passage. The other sentences and ideas in the passage will all relate to that main idea and serve as "evidence" that the assertion is true.

► What is the main idea of the above passage?

- 1) Express Mail is a good way to send urgent mail.
- 2) Mail service today is more effective and dependable.
- 3) First-class mail usually takes three days or less.
- 4) U.S. is wide country.

Example 2: Before man had flown in space it was thought that his physical and mental capabilities might be affected by prolonged weightlessness, and that he might be subjected to dangerous levels of cosmic radiation. Yuri Gagarin's first space flight in April 1961 showed that man could live in space and, although this journey only lasted for 108 minutes, it gave encouragement to those interested in the future of manned spaceflight. In fact most of the early fears about man's health in space have proved groundless and, although several odd medical effects have been observed, none have seriously affected man's ability for useful work.

► What is the main idea of the above passage?

- 1) The effect of weightlessness on astronauts.
- 2) The effect of space on man's health.
- 3) The positive effects of Gagarin's spaceflight.
- 4) The ability of man to do useful work in space.

- Read the following passages and find the main idea of each one.

► **Exercise 1 (CE 86)**

Finally, you'll be able to buy high-definition movies on disc- and the devices that play them- at your local store. As observers had expected, HD DVD (the format baked by Toshiba and Microsoft) will arrive first, with players- the least expensive being Toshiba's \$499 HD-AI- and movies expected for scale by late March.

Before buying one of these players, though, you'd better check your TV's inputs. If you don't use a High Definition Content Protocol- enabled, HDMI connection, you may not get full, high-definition resolution output for the player. HD DVD can't guarantee high-definition output over analog component connections, or even over non-HDCP digital connections. Ultimately the content creators- the movie studios- control what you will see. Industry insiders say that the studios don't plan to lower the resolution of images in their early titles, but that could change over time.

te

Handwriting practice lines consisting of multiple horizontal dotted lines for tracing and writing practice.

1 - What is the main idea in the above passage?

- | | |
|---------------------------------|--------------------------------------|
| 1) arrival of HD DVD players. | 2) creation of HD DVD players. |
| 3) upgrading of HD DVD players. | 4) implementation of HD DVD players. |

► Exercise 2 (EE 84)

The burning of coal is very wasteful of energy. This can be realized when we remember that one pound of coal burned in the furnace of a power station will raise enough steam to drive a generator that will produce enough current to light a one-bar electric fire for three hours. On the other hand, if all the energy in the atoms of a pound of coal could be released, there should be enough energy to drive all the machinery in all the factories in Britain for a month.

2 - Paragraph one mainly ...

- 1) talks about burning of coal in the furnace of a power station
- 2) tells us to burn coal because it is a good natural resource to be wasted
- 3) recommends not to release all the energy in the form of a pound of coal
- 4) compares the energy produced by coal and that produced by splitting of atoms

► Exercise 3 (CE 85)

Finding text is easy, but finding video is not. Imagine you wanted to find, say, the episode of "The Simpsons" in which Homer makes psychedelic chili. Type those keywords into a search engine such as Google, and you will find testaments to its side-splitting humor - but not the episode itself.

In anticipation, big websites such as Google, Yahoo, and AOL have started to offer basic video-search capabilities, and upstarts such as Blinkx and TVEyes (which has teamed up with Yahoo) have popped up as well. The opportunity is immense-searching video content could create a web-based television network, just as Google uses its search engine to assemble a virtual web-based newspaper. It could also be helpful in digital video recorders (DVRs) such as the TiVo, by making programs easier to access.

Searching video clips or streams is, however, much harder than searching text. There are three main approaches. The first, and simplest, is to search the closed captioning, or subtitles, that are broadcast alongside television programs. The second approach uses software to "listen" to the video's soundtrack. Turning spoken dialogue into text requires fancy algorithms and is not always reliable, as anyone who has ever used speech-recognition system can testify. But the resulting text is then simple to search. The third approach, called semantic tagging, involves applying tags to video clips, either manually or automatically. Tags may describe the genre of a clip, which actors appear in it, and so on. The tagged video can then be easily searched. These three approaches are used on their own or, more often, in conjunction with one another to analyze, label and then search through video content. However, the challenge is getting hold of video to search as the content does not originate on the web.

3 - What does the passage suggest?

- 1) A search engine for text
- 2) A search engine for speech
- 3) A search engine for video
- 4) All of the above

te

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(Exercise 4 (CE 85)

Got sensitive information in your workstation's files at the office? Do you worry when you must step away for a few minutes that someone could snoop around too easily? If so, you might want to safeguard your system with the USB Wireless Security Lock. It works like a car's remote door opener. Walk away from your computer and the machine instantly locks up, making its contents inaccessible to anyone else. When you return, the computer is automatically available.

The secret is in a round transmitter you carry in your pocket. It's powered by a 3-volt battery and has a range of about 2 meters - enough to signal a receiver dongle plugged into the computer's USB port to keep the machine turned on. Walk out of range, and the dongle loses the 315-megahertz signal and locks the computer. This scheme is safer than a password protection system linked to a computer's screen saver, which is usually set to turn on after a few minutes of inactivity. That leaves a window of time during which someone can fiddle with your computer.

If the transmitter is lost or the dongle is removed, a series of user-selected passwords, which only you will know, allows you to regain access to your machine.

4. Which of the following statements best reveals the idea behind the passage?

- 1) Having a USB Wireless Security Lock can be very efficient in making your computer's content inaccessible to others
 - 2) Having a USB Wireless Security Lock allows you to regain access to your machine in case the transmitter is lost
 - 3) It's better to have a security plug rather than a password to make your computer inaccessible to other users
 - 4) With a remote control you may be able to control access to your computer
-

(Exercise 5 (IT 87)

Artificial intelligence research follows two distinct, and to some extent competing, methods, the symbolic (or "top-down") approach, and the connectionist (or "bottom-up") approach. The top-down approach seeks to replicate intelligence by analyzing cognition independent of the biological structure of the brain, in terms of the processing of symbols-whence the *symbolic* label. The bottom-up approach, on the other hand, involves creating artificial neural networks in imitation of the brain's structure-whence the connectionist label.

To illustrate the difference between these approaches, consider the task of building a system, equipped with an optical scanner, that recognizes the letters of the alphabet. A bottom-up approach typically involves training an artificial neural network by presenting letters to it one by one, gradually improving performance by "tuning" the network. (Tuning adjusts the responsiveness of different neural pathways to different stimuli.) In contrast, a top-down approach typically involves writing a computer program that compares each letter with geometric descriptions. Simply put, neural activities are the basis of the bottom-up approach, while symbolic descriptions are the basis of the top-down approach.

te

A series of horizontal dotted lines for writing, spanning the width of the page.

5 - What does the passage mainly discuss?

- 1) Findings or research in the field of artificial intelligence
- 2) Two different methods in artificial intelligence research
- 3) The best approach to solve the artificial intelligence enigma.
- 4) Ways to use computer science to make artificial intelligence a practical issue.

► *Exercise 6 (IT 87)*

Along with helping to integrate a firm's own value chain, transaction processing systems can also serve to integrate an organization's overall supply chain. This includes all of the various firms involved in designing, marketing, producing, and delivering the goods and services-from raw materials to final delivery. Thus, interorganizational information systems are essential to supply-chain management. For example, purchasing an item at a Wal-Mart store generates more than a cash register receipt; it also automatically sends a restocking order to the appropriate supplier. Suppliers can also access a retailer's inventory database over the Web to schedule efficient and timely deliveries.

Many transaction processing systems support electronic commerce over the Internet. Among these are systems for on-line shopping, banking, and securities trading. Other systems deliver information, educational services, and entertainment on demand. Yet other systems serve to support the search for products with desired attributes, price discovery (for example, via an auction), and delivery of products in an electronic form (software, music, movies, or greeting cards). A growing array of specialized services and information-based products are offered by various organizations on the Web, as an infrastructure for electronic commerce is emerging on a global scale.

6 - The passage mainly presents.....

- 1) steps in a process
- 2) function description
- 3) comparison and contrast
- 4) examples from business transaction

► *(Exercise 7 (CE 87)*

There is a fundamental relationship between the computer hardware and the many aspects of programming and software components in computer systems. In order to write good software, it is very important to understand the computer system as a whole. Understanding hardware can help you explain the mysterious errors that sometimes creep into your programs, such as the infamous segmentation fault or bus error. The level of knowledge about computer organization and computer architecture that a high-level programmer must have, depends on the task the high-level programmer is attempting to complete.

7 - The passage is mainly about

- 1) how to prevent mysterious errors creep into our programs.
- 2) how to advance the level of knowledge in computer organization.
- 3) the fundamental difference between hardware and software programmers.
- 4) the fact that programmers need to have good knowledge of hardware.

نکته سؤال حدس معنی کلمه است و گزینه ۳ درست است.

۴۴- گزینه ۳ درست است.

سؤال از نوع restatement است. گزینه‌های (۱) و (۲) مربوط به پاراگراف اول نیستند. گزینه (۴) باعث افزایش توان تلفاتی می‌شود.

۴۵- گزینه ۲ درست است.

سؤال از نوع restatement است و جمله target آن در خط اول پاراگراف ۲ قرار دارد. نکته سؤال تطابق بین سؤال و جواب است.

گزینه (۱) روش است (by..). و نه دلیل. گزینه (۲) بازنویسی شده بخش اول جمله target (because...) است و گزینه درست خواهد بود. صحت گزینه (۳) از متن قابل برداشت نیست. در گزینه (۴) کلمه کلیدی DC حذف شده است.

۴۶- گزینه ۳ درست است.

عبارت مرجع this باید قبل از مطرح شده باشد بنابراین گزینه‌های (۱) و (۴) غلط هستند. گزینه (۲) جمع است و نمی‌تواند مرجع

this باشد. در گزینه (۳) بجای direction و magnitude از parameters استفاده شده است.

۴۷- گزینه ۲ درست است.

در مورد گزینه (۱) در متن آمده است to be released late this year که به معنی "آخر امسال" می‌باشد بنابراین این گزینه غلط

است. با توجه معنی successor (بعدی) در عبارت Vista, the successor to XP, می‌توان گزینه (۲) را نتیجه گرفت.

predecessor به معنی "قبلی" است.

در گزینه (۳) عبارت متن بطور غیر صحیح بازنویسی شده است و در مورد گزینه (۴) اطلاعاتی در متن موجود نیست.

۴۸- گزینه ۱ درست است.

سؤال از نوع inference است. توجه کنید که این متن در سال ۲۰۰۶ نوشته شده است. با توجه به پاراگراف سوم Extended

Support بصورت "مجانی" نبوده و تا پنج سال پس از حمایت عادی mainstream support ادامه خواهد داشت و این پشتیبانی تا

سال ۲۰۱۳ ادامه خواهد داشت. بنابراین حمایت "مجانی" فقط تا سال ۲۰۰۸ (۲۰۰۸=۲۰۱۳-۵) وجود خواهد داشت.

۴۹- گزینه ۳ درست است.

سؤال از نوع inference است. با توجه به جمله آخر و عبارت Extended Support for XP for two more years after the

release of the next operating system after Vista, می‌توان نتیجه گرفت که جدیدترین محصول در سال ۲۰۱۱-

(۲۰۱۱=۲۰۱۳-۲) به بازار می‌آید.

۵۰- گزینه ۱ درست است.

جمله "We have corrected the error, and we apologize for any inconvenience this may have caused our

customers," در باره Windows XP است و نمی‌توان درباره سایر سیستم عاملها نتیجه‌گیری کرد. گزینه ۴ نیز کلی است که به

این جمله مربوط نمی‌شود.

► (Exercise 8 (IT 84)

Whereas an Intranet resides behind a firewall and is accessible only to people who are members of the same organization, an extra net provides various levels of accessibility to outsiders. Typically, an extra net can be accessed only if the outsider has a valid user name and password, and this identity specifies which parts of the extra net can be viewed. Extranets are becoming a very popular means for business partners to exchange information.

Other approaches that provide this facility have been used for a number of years. For example, Electronic Data Interchange (EDI) allows organizations to link such systems as inventory and purchase-order. These links foster applications such as just-in-time (JIT) inventory and manufacturing, in which products are manufactured and shipped to a retailer on an "as-needed" basis. However, EDI requires an expensive infrastructure. Some organizations use costly leased lines; most outsource the infrastructure to value-added networks (VANs), which are still far more expensive than using the Internet. EDI also necessitates expensive integration among applications. Consequently, EDI has been slow to spread outside its key markets, which include transportation, manufacturing, and retail.

In contrast, implementing an extranet is relatively simple. It uses standard Internet components: a Web server, a browser or applet-based application, and the Internet itself as a communications infrastructure. In addition, the extranet allows organizations to provide information about themselves as a product for their customers. For example, Federal Express provides an extranet that allows customers to track their own packages. Organizations can also save money using extra nets: moving paper-based information to the Web, where users can access the data they need when they need it, can potentially save organizations significant amounts of money and resources that would otherwise have been spent on printing, assembling packages of information, and mailing.

8 - The passage is mainly concerned with....

- 1) the intranet, the extra net, and EDI
- 2) the major features of an intra net
- 3) the advantages of EDI over other approaches
- 4) the similarities between the intranet and the extranet

► (Exercise 9 (CE 83)

Human memory formerly believed to be rather inefficient, is really more sophisticated than that of a computer. Researchers approaching the problem from a variety of points of view have all concluded that there is a great deal more stored in our minds than has been generally supposed. Dr. Wilder Penfield, a Canadian neurosurgeon, proved that by stimulating their brains electrically, he could elicit the events supposedly forgotten for many years suddenly emerged in detail.

The memory trace is the term for whatever is the internal representation of the specific information about the event stored in the memory. Assumed to have been made by structural changes in the brain, the memory trace is not subject to direct observation but is rather a

نکته سؤال ارتباط بین جملات متوالی در متن است. بازی cat-and-mouse در دومین جمله متن اشاره شده است. با توجه به جملات بعدی، بهترین گزینه، گزینه ۱ است. با توجه به نوع بازی، اجزاء گزینه درست باید با هم متضاد باشند که گزینه‌های ۳ و ۴ دارای این خاصیت نیستند.

۳۴- گزینه ۲ درست است.

با توجه به جمله The load on the server depends on the number of messages, not the quantity of data, which is what the detection system is measuring و با توجه به ضمیر which که the quantity of data بر می‌گردد، گزینه ۲ درست است.

۴۵- گزینه ۱ درست است.

سؤال از نوع restatement است که جمله target آن اولین جمله پاراگراف سوم است. با توجه به این جمله گزینه ۱ درست است.

۳۶- گزینه ۴ درست است.

محتوای گزینه‌های ۱ تا ۳ در متن اشاره شده است. بنابراین بهترین گزینه، گزینه ۴ است.

۳۷- گزینه ۲ درست است.

با توجه به آخرین جمله پاراگراف اول می‌توان نتیجه گرفت که گزینه ۲ غلط است.

۳۸- گزینه ۳ درست است.

با توجه به عبارت some have even built prototype chips گزینه ۱ غلط است. چون از خلاء بعنوان عایق استفاده شده است بنابراین گزینه ۲ نیز غلط است. بر اساس آخرین جمله متن، این عایق دارای راندمان بالا بوده اما هزینه‌بر (money drain) است. بنابراین گزینه ۴ نیز اشتباه بوده و جواب گزینه ۳ خواهد بود.

۳۹- گزینه ۱ درست است.

از Edelstein دو جمله در متن موجود است که بر اساس آنها باید به این سؤال پاسخ داد. اما بهترین روش برای این سؤال حذف گزینه‌ها است.

۴۰- گزینه ۴ درست است.

سؤال از نوع inference است. باز بهترین روش برای این سؤال حذف گزینه‌ها است. به گزینه ۱ در متن اشاره‌ای نشده است. در گزینه ۲ اگر بجای theoretical عبارت practical بود درست می‌شد. گزینه ۳ بوضوح غلط است زیرا متن روشهایی را درباره دسترسی به سیستمهای دقیق توضیح می‌دهد. بنابراین گزینه ۴ درست است.

۴۱- گزینه ۴ درست است.

سؤال از نوع استاندارد است.

۴۲- گزینه ۳ درست است.

سؤال از نوع inference است. با توجه به عبارت unalterable که بمعنی تغییر ناپذیر است می‌توان درست بودن گزینه (۱) را حدس زد.

۴۳- گزینه ۳ درست است.

theoretical construct that we use to speculate about how information presented at a particular time can cause performance at a later time. Most theories include the strength of the memory trace as a variable in the degree of learning, retention, and retrieval possible for a memory. One theory is that the fantastic capacity for storage in the brain is the result of an almost unlimited combination of interconnections between brain cells, stimulated by patterns of activity. Repeated references to the same information support recall. Or, to say that another way, improved performance is the result of strengthening the chemical bonds in the memory.

9 - With what topic is the passage mainly concerned?

- | | |
|--------------------|-----------------------|
| 1) Neurosurgery | 2) Human memory |
| 3) Wilder Penfield | 4) Chemical reactions |

بهترین روش برای پاسخدهی به این سؤال حذف گزینه‌ها است. با توجه به تعداد خطوط این نوع برنامه‌ها گزینه (۳) می‌تواند درست باشد.

۲۳- گزینه ۳ درست است.

سؤال درباره آینده است. بنابراین گزینه‌های (۱) و (۴) که راه حل‌های حال و گذشته هستند، نمی‌توانند درست باشند. گزینه (۲) زمان انجام این عمل است (آینده نزدیک) است.

۲۴- گزینه ۲ درست است.

در صورت سؤال کلمه prevalent به معنی رایج است که بوضوح گزینه ۲ درست است. گزینه‌های (۱) و (۳) معادل هم بوده و نمی‌توانند درست باشند. بعلاوه اینکه آنها هنوز مورد استفاده قرار نگرفته‌اند.

۲۵- گزینه ۱ درست است.

گزینه (۱) بدلیل only نادرست است. مزیت دیگر آن faster-switching transistors است.

۲۶- گزینه ۴ درست است.

سؤال از نوع استاندارد است. بر اساس انتهای متن و جمله آخر گزینه ۴ درست است.

۲۷- گزینه ۳ درست است.

با توجه به جمله

whose power grows exponentially with each additional qubit

گزینه (۳) درست است زیرا قدرت آن بطور نمایی افزایش می‌یابد.

۲۸- گزینه ۳ درست است.

با توجه به پاراگراف دوم، گزینه (۲) خصوصیت کامپیوترهای متداول است. گزینه (۴) کاربرد کامپیوترهای کوانتومی است. گزینه (۱) و (۳) به هم نزدیک هستند اما گزینه (۳) کامل تر است.

۲۹- گزینه ۱ درست است.

نکته سؤال ضمیر this است. با توجه به دو جمله ابتدایی پاراگراف دوم، ضمیر this approach به electrical current scalable

quantum computer بر می‌گردد. بنابراین گزینه ۱ درست است. در این گزینه بجای currents degrade fairly rapidly عبارت

currents corrupted quickly آمده است.

۳۰- گزینه ۳ درست است.

با توجه به پاراگراف دوم، گزینه ۳ صحیح است. گزینه ۴ اگرچه یک جمله درست است اما دلیل محسوب نمی‌شود.

۳۱- گزینه ۱ درست است.

با توجه به عبارت through electromagnetic interaction در پاراگراف آخر، گزینه ۱ صحیح است.

۳۲- گزینه ۲ درست است.

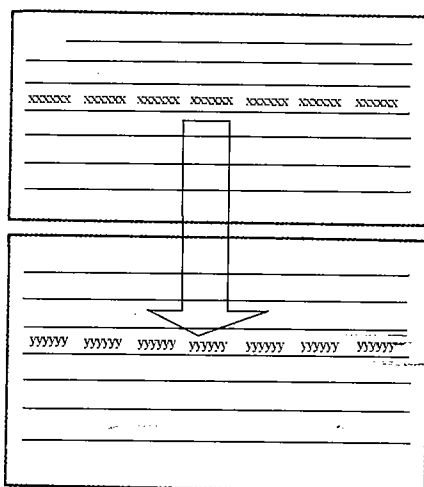
سؤال از نوع restatement است. براساس جمله دوم از پاراگراف آخر، گزینه ۲ درست است.

۳۳- گزینه ۱ درست است.

Lesson 4

Restatement Questions

Lesson two presented an important skill called getting the essential information. In this type of question, the answer is stated in the passage which is called the *target*. In the simplest form, the target is the exact form of the passage. However, there is another type of question called restatement question. In this type of question, the structure of the target has changed, some synonyms have been used in the target instead of the original words, or some names have been replaced with their corresponding pronouns.



This type of question is frequently used in recent exams.

Assume the following sentence and determine which of the following choices is not restated the target sentence.

جمله هدف در انتهای پاراگراف سوم است. با توجه به things would quickly get hot enough to melt گزینه ۳ درست است.

۱۳- گزینه ۱ درست است.

نکته سؤال حدس معنی کلمه از روی متن است. با توجه به حرف اضافه out احتمال درست بودن گزینه‌های ۱ و ۲ بیشتر است. براساس متن seep out و slipping out درباره حرکت الکترونها هستند و می‌توان تشابه آنها را حدس زد.

۱۴- گزینه ۲ درست است.

سؤال از نوع استاندارد است و نکته سؤال ارتباط بین پاراگرافهای متوالی می‌باشد. برای جواب دادن باید به این سؤال پاراگراف آخر متن توجه کرد. با توجه به but nothing ever really panned out—until recently.

می‌توان به درست بودن گزینه (۲) پی برد.

۱۵- گزینه ۲ درست است.

سؤال از نوع استاندارد است. گزینه (۱) نامرتب با متن است. گزینه‌های (۳) و (۴) نیز موارد جزئی هستند.

۱۶- گزینه ۳ درست است.

در گزینه (۱) minimize غلط است. گزینه (۲) بازی با کلمات است و جای علت و معلول عوض شده است. با توجه به عبارت Imagine computers learning در متن و وجود at present time در گزینه (۴) این گزینه نیز نادرست است.

۱۷- گزینه ۱ درست است.

با توجه به اینکه ضمیر their به houses برمی‌گردد، می‌توان حدس زد که کلمه مورد نظر ساکنان منزل باشد. بنابراین گزینه ۱ درست است.

۱۸- گزینه ۴ درست است.

سؤال از نوع استاندارد است. برای یافتن موضوع پاراگراف ماقبل متن باید به ابتدای پاراگراف اول رجوع کرد. با توجه به عبارت Another consequence معلوم است که موضوع پاراگراف مورد نظر باید consequence (پی‌آمد و نتیجه اولیه) باشد. بنابراین

گزینه ۴ درست است.

۱۹- گزینه ۲ درست است.

نکته این سؤال یافتن اسم مربوط به ضمیر است که به نزدیکترین اسم یعنی debug برمی‌گردد.

۲۰- گزینه ۱ درست است.

در باره گزینه‌های (۲) و (۴) در متن توضیحی نیست. گزینه (۳) در مورد commercial software products درست است.

۲۱- گزینه ۱ درست است.

کلمه nevertheless نشان دهنده تضاد بین دو جمله‌ای است که بوسیله آن به هم وصل می‌شوند. در بین گزینه‌ها تنها گزینه (۱) دارای این شرایط است. گزینه (۲) تشابه را می‌رساند. سایر گزینه‌ها نامرتب هستند.

۲۲- گزینه ۳ درست است.

► **Example 1:** "It is estimated that 260,000 head of Texas cattle crossed the Red River for the northern markets in 1866. "

- 1) The 260,000 head of Texas cattle which, it has been estimated, crossed the Red River in 1866 were heading to the northern markets.
- 2) 260,000 head of Texas cattle were estimated in 1866 to have crossed the Red River for the northern markets.
- 3) Heading for the northern markets, 260,000 head of cattle crossed the Red River in 1866.
- 4) One estimation is that, in 1866, 260,000 head of Texas cattle crossed the Red River, heading for the northern markets.

- Read the sentences and then say which of the four answers (A), (B), (C) or (D) restates it.

► **Example 2:** The highway system is a network for locomotion across relatively large distances.

- 1) The highway system is a system for moving slowly over large distances.
- 2) One can move over comparatively large distances thanks to the whole highway network.
- 3) The network for the transportation of goods called the highway system facilitates travel over relatively large distances.
- 4) Thanks to the highway system a network of large distances can be covered.

► **Example 3:** Half of the people in our world never set foot in school.

- 1) 50% of the world's population have gone to school.
- 2) Only 50% of those who attend school walk there.
- 3) 50% of the world's population have walked to school.
- 4) Only 50% of the world's population have walked to school.

► **Example 4:** Historians cannot agree where the game of golf originated.

- 1) Where did the game of golf start? Historians do not know.
- 2) It is hard to get historians to agree. One example of this is their discussion on where golf originated.
- 3) The origins of golf are disputed by historians.
- 4) The game of golf has a number of origins, according to historians.

► **Example 5:** Tepees came in many sizes, some extremely large.

- 1) There were many sizes of large tepees.
- 2) The sizes of tepees varied from very small to very large.
- 3) Tepees were sold in different sizes; some could be very large.
- 4) There were many sizes of tepee, some very large.

► **Example 6:** Although no one knew for sure who invented the first typewriter, this did not stop everyone from claiming the honor.

- 1) Many people claimed that they had insured the first typewriter.
- 2) The person who invented the first typewriter should have been honored by everyone.
- 3) Although claiming the honor of inventing the first typewriter was a doubtful thing to do, many people still did it.
- 4) Many claimed to have invented the first typewriter; we cannot be sure who was right.

Supplimentary Tests Answer

۱- گزینه ۳ درست است.

سؤال از نوع استاندارد است. با توجه به پاراگراف اول که در مورد مشکلات (obstacles) اندازه گیری بازده سلول خورشیدی است، گزینه (۳) درست است. توجه کنید که بقیه پاراگرافها نیز درباره همین موضوع هستند، بنابراین یک fully essay داریم.

۲- گزینه ۴ درست است.

پاراگراف دوم مزایای نور مصنوعی را برمی شمارد و گزینه (۴) کاملترین گزینه است.

۳- گزینه ۴ درست است.

نکته سؤال ضمیر است. با توجه به ضمیر this در پاراگراف دوم، مطالب جمله قبل از آن به اطلاعات این جمله اضافه می شود. بنابراین گزینه های ۱ و ۲ ناقص بوده و گزینه (۴) که هر دو را شامل دارد بهترین گزینه است.

۴- گزینه ۱ درست است.

سؤال از نوع restatement بوده و بسیار ساده است. جمله هدف آن در پاراگراف سوم آمده است.

۵- گزینه ۲ درست است.

نکته سؤال ارتباط بین جملات متوالی است. با توجه به دو جمله انتهایی متن، گزینه ۲ درست است.

۶- گزینه ۳ درست است.

نکته سؤال حدس معنی کلمه است. با توجه به اینکه hue مرتبط light است و هر چهار گزینه می توانند در ارتباط با نور باشند، سؤال مشکل است زیرا نمی توان معنی کلمه را از روی متن حدس زد.

۷- گزینه ۴ درست است.

با توجه به پاراگراف اول که در مورد مشکلات گالیم آرسناید است، گزینه (۴) کاملترین گزینه است.

۸- گزینه ۴ درست است.

نکته سؤال ارتباط بین پاراگرافهای متوالی است. در پاراگراف اول دلایل هزینه بر بودن گالیم آرسناید ذکر شده است. در پاراگراف دوم نحوه حل این مشکلات توسط گروه IBM آمده است که می توان به درست بودن گزینه (۴) پی برد.

۹- گزینه ۱ درست است.

گزینه های ۲ و ۳ به جمله هدف مربوط نیستند. گزینه (۴) به علت استفاده از کلمه receiver به جای transmitter غلط

است. طبق آخرین جمله متن، گزینه ۱ درست است.

۱۰- گزینه ۴ درست است.

نکته این سؤال ارتباط بین جملات متوالی است. با توجه به عبارت در انتهای پاراگراف اول می توان درست بودن گزینه (۴) را حدس زد.

۱۱- گزینه ۳ درست است.

جمله هدف در پاراگراف دوم آمده است. با توجه به جملات این پاراگراف و نیز مشکل solid-state physics در پاراگراف قبلی، جواب electrons fall a short distance into the undoped material است.

۱۲- گزینه ۳ درست است.



To find the target sentence in the passage, you can use the **common** words (or their synonyms) between the question sentence and the target sentence. In some cases, the target is located after these common words (common words are the starting point).



After finding the target sentence, **only** compare it with the four choices.

► Exercise 1 (CE 79)

One way of classifying robots is in terms of their similarity to humans. An automaton is any machine capable of operating independently, such as clothes dryer. A flexible machine is a special case of automation with different capabilities. That can be programmed as the need arises. An example is a welding robot on the factory floor that can be programmed to participate in other production operations. A mobile robot is a flexible machine capable of moving freely in its own environment. It can partly select its own goals and can also communicate with other agents, including humans. An android or humanoid is a mobile robot whose structure approximately resembles a human structure. Finally, a Cyborg is a humanoid with organic structures. Cyborgs have some physiological structures similar to those of humans. Despite all our efforts, however, robot hands, legs, eyes and reasoning powers have a long way to go before they can approach what biological evolution has achieved over the course of hundreds of millions of years. Much more will have to happen in laboratories around the world before robots can be compared to nature's handiwork.

1 - An android

- 1) is a cyborg with a human-like structure but without any inorganic parts
- 2) is not capable of independent operation
- 3) lacks the ability to move freely in its own environment and should be placed in position by human operators
- 4) is a flexible machine of human properties capable of communicating with other agents

► Exercise 2 (CE 78)

This paragraph presents work in applied geometric hashing for efficiently accessing very large databases of stored geometric information, originated in the mid-eighties at New York University's Courant institute of mathematical sciences. This method emerged initially as general scheme for carrying out model-based object recognition in computer vision. Geometric hashing permitted the detection of objects from a given model database in sense, where additional clutter might be present and the objects might partially occlude each other. The key observation was that a judicious choice of geometric invariants describing local see features and proper encoding of geometric constraints inherent to rigid bodies let vision systems exploit the extremely efficient hashing methods for geometric data retrieval.

DC link. This has caused many power system operators to contemplate wider use of HVDC technology for its stability benefits alone.

44 - According to the first paragraph, how the transmission power loss can be reduced? By...

- 1) sending less quantity of power.
- 2) using DC variables instead of AC variables.
- 3) reducing the current.
- 4) using conductors with smaller cross section.

45 - Why does HVDC increase system stability?

- 1) because it prevents cascading failures from propagating from one part of a wider power transmission grid to another.
- 2) because it lets unsynchronised AC distribution systems transmit power.
- 3) because it does not allow an AC network to become unsynchronized.
- 4) because the magnitude and direction of power flow can be directly commanded.

46 - The word *this* in the last paragraph refers to...

- 1) HVDC technology.
- 2) the magnitude and direction of DC current.
- 3) the ability of changing power parameters in a DC link.
- 4) HVDC stability.

Passage 13

JANUARY 13, 2006 .Microsoft Corp. yesterday confirmed that it will continue to provide mainstream support for all flavors of Windows XP, including Home and Professional editions, for two years after the release of Windows Vista, the successor to XP, is expected to be released late this year.

"We have corrected the error, and we apologize for any inconvenience this may have caused our customers," a Microsoft spokesperson said.

Extended Support for XP, which customers must pay for, will also be provided by Microsoft for five years after mainstream support for Windows XP ends. That means the end of support for those customers is likely to occur at the end of 2013. Alternately, Microsoft will provide Extended Support for XP for two more years after the release of the next operating system after Vista.

47 - Which of the following statements is TRUE?

- 1) it is late for Microsoft Corp to release Vista at this year.
- 2) Windows XP is the predecessor to Vista.
- 3) Microsoft spokesperson said their customers have caused inconvenience and we apologize.
- 4) Windows Vista has much less error than Windows XP.

48 - According to the passage, Microsoft will freely support Windows XP until...

- | | | | |
|---------|---------|---------|---------|
| 1) 2008 | 2) 2009 | 3) 2010 | 4) 2013 |
|---------|---------|---------|---------|

49 - After Windows XP and Vista, Microsoft expects to release its new operating system at....

- | | | | |
|---------|---------|---------|---------|
| 1) 2010 | 2) 2012 | 3) 2011 | 4) 2013 |
|---------|---------|---------|---------|

50 - According to the Microsoft spokesperson interview.....

- 1) Windows XP had errors.
- 2) Windows Vista has errors.
- 3) the next operating system after Vista will have some errors.
- 4) all operating systems may have errors.

Although easy to state, the problem of computer-based object recognition is very difficult to solve in its general form. In fact, until recently, computer vision was included among computer sciences' grand challenges. However, numerous successful applications have emerged for specific tasks and constrained environments. In this geometric hashing approach, performing does not degrade linearly with addition of previous techniques. Geometric hashing indexing technique allows the speedy identification of relevant locations in the database while also obviating the need to sequentially search the entire database. By using a redundant set of indices for each object, this technique effectively handles the partial-occlusion problem.

2 - Geometric hashing method

- 1) is a method for moving geometrical object in a picture
- 2) is a method for identifying geometrical shapes
- 3) carries out model-based object
- 4) is used for accessing large databases



When you have found the target, **stop** reading further, or else you would get more confused and your time would be wasted.

► *Exercise 3 (CE 80)*

The first step in this process is to understand the requirements for optimum operation of each device in the system. Each device has a peak power rating, a maximum case temperature, and a maximum junction temperature. These three parameters are key to determine what cooling is needed. The operating environment for the system is the next important piece of the thermal puzzle.

3 - What could be the first important piece of thermal puzzle?

- | | |
|---------------------------------|---------------------------------------|
| 1) peak power rating | 2) maximum case temperature |
| 3) maximum junction temperature | 4) conditions for maximum performance |

► *Exercise 4 (EE 82)*

In the early days of electric power industry, the distribution systems were often mere appendages to power generation plans. Their designs were predicated almost entirely on practicality. With little study, their installation and operation were considered more of an art than a science.

4 - The make-up of the early distribution systems.....

- | | |
|---|---|
| 1) was scientifically oriented | 2) was based on experience |
| 3) matched with the number of consumers | 4) coordinated with that of the power systems |



Usually, target sentence is a **long and complex** sentence.

systematically determine the components necessary to perform the given objective. In practice, however, the system may be subjected to many constraints or may be nonlinear, and for such cases no synthesis methods are available at present. In addition, the characteristics of components may not be precisely known. Thus, trail-and-error procedures are always necessary.

Situations are often encountered in practice where a plant is unalterable, and control engineer has to design the rest of the system so that the whole will meet the given specifications in accomplishing the given task.

- 40 - Which of the following is an assumption made by the author?
- 1) linearity and nonlinearity are familiar concepts to students of control systems.
 - 2) trail-and-error procedures may seem good theoretically, but would be useless if carried out.
 - 3) the idea of planning a precise control system would never work in practice.
 - 4) the methods currently involved in synthesis of control systems are outdated.
- 41 - The first paragraph mainly discusses....
- 1) the components needed to synthesis accurate control systems.
 - 2) the reasons why the procedures necessary to design a linear control system are different from those involved in the design of nonlinear system.
 - 3) the difficulties that may arise from nonlinear control systems.
 - 4) the reasons why trail and error procedures are necessary involved in the design to a control system.
- 42 - It can be deduced from the text that, an unalterable plant is a system...
- 1) that we are not free no change its dynamics.
 - 2) in which the characteristics of components may not be precisely known.
 - 3) that may be subjected to many constraints.
 - 4) that can accomplishes the given task.
- 43 - The word *objective* in the passage can be replaced by....
- 1) subjective.
 - 2) resources.
 - 3) goals.
 - 4) facilities.

Passage 12

High voltage is used for transmission to reduce the energy lost in the resistance of the wires. For a given quantity of power transmitted, higher voltage reduces the transmission power loss. Power in a circuit is proportional to the current, but the power lost as heat in the wires is proportional to the square of the current. However, power is also proportional to voltage, so for a given power level, higher voltage can be traded off for lower current. Thus, the higher the voltage, the lower the power loss. Power loss can also be reduced by reducing resistance, commonly achieved by increasing the diameter of the conductor; but larger conductors are heavier and more expensive.

Because HVDC allows power transmission between unsynchronised AC distribution systems, it can help increase system stability, by preventing cascading failures from propagating from one part of a wider power transmission grid to another. Changes in load that would cause portions of an AC network to become unsynchronized and separate would not similarly effect a DC link, and the power flow through the DC link would tend to stabilize the AC network. The magnitude and direction of power flow through a DC link can be directly commanded, and changed as needed to support the AC networks at either end of the

► *(Exercise 5 (EE 83)*

As the drive for further integration of analog, digital, RF, and MEMS onto a single die has intensified, behavioral modeling and simulation with Mixed-Signal Hardware Description Languages (HDLs) has become critical to address the challenge of designing today's increasingly complicated electronic and electronic-based systems. The recent emergence of a new generation of mixed analog digital simulators capable of simulating the standard languages (VHDL-AMS and Verilog-NMS) exemplifies this trend. Research efforts to include RF extensions to these standards and couple EM algorithms to mixed analog-digital methods continue to promulgate this field. The purpose of this special issue is to provide a means of rapid publication of the latest research advances in behavioral modeling and simulation. The special issue will deal with aspects of behavioral modeling, simulation, and applications including algorithms, tools, and methods that exploit modeling and simulation across various abstraction levels and various disciplines.

5 - Behavioral modeling and simulation with Mixed-Signal Hardware Description Languages has become critical because ...

- 1) there is an ever-increasing need to build analog, digital, RF, and MEMS onto a single die
- 2) of a declining trend in the growth of complicated electronic and electronic-based systems
- 3) there has been a drop in the implementation of analog, digital, RF, and MEMS onto a single die
- 4) of the emergence of mixed analog digital simulators capable of simulating the standard languages (VHDL-AMS and Verilog-A/MS)

6 - This special issue

- 1) will deal with aspects of behavioral modeling, and simulations alone
- 2) will deal with aspects of behavioral modeling, simulations, and applications
- 3) will provide means of rapid publication of the latest research advances in non-behavioral modeling and simulation
- 4) None of the above

► *Exercise 6 (CE 81)*

As the internet continues to grow, the roles of the various participants in developing and evolving standards naturally come under closer scrutiny. When the financial implications of internet standards decisions were relatively small, the current standards process that emerged from the research community proved entirely satisfactory. As the financial impact of such decisions become increasingly significant, the nature of the standards process will continue to change accordingly to allow more direct industrial involvement in the decision making process. How this will ultimately plan out is yet unclear. However, the vitality of the current process derives from the board involvement of the many communities that have a stake in the internet. Unlike typical standards processes that form consensus decisions and then proceed to implement them, the internet process works essentially in reverse by a kind of gross-roots mechanism. Internet standards are those that have been tried, found by actual trial and error to be desirable and the

36 - What does the author suggest for reducing false positives?

- 1) entropy of the network should be analyzed instead of its traffic.
- 2) a more comprehensive traffic model should be obtained based on the entire network.
- 3) a single link- single time traffic model should not be used.
- 4) all of above.

Passage 10

Ever since the microchip was invented, the basic rule of thumb has been that transistor size is the limiting factor on chip speed. "Transistors are the fluke of nature," Edelstein explains. "They get faster when they get smaller, but nothing else does." A microprocessor may have hundreds of millions of transistors, but no matter how fast those transistors get, they depend on wires, which get much slower when they get smaller. That's a problem for the transistors, which must compensate by using more power. It's also a problem for the wires, which must radiate heat from the extra power the transistors are using.

As it turns out, the source of the signal lag is not so much the metal interconnects themselves but rather the insulation between the wires. So the question of the moment is, what can you put between those wires to prevent the signal from leaking?

Vacuum is the best insulator known. Since the 1990s, many chip manufacturers besides IBM, including Infineon Technologies, in Munich, and STMicroelectronics, in Geneva, have experimented with vacuum cavities, and some have even built prototype chips. But two problems have kept the technology from entering production. A chip needs insulation to shield its wires from one another, but it also depends on that insulation for structural support to survive what can be a rough manufacturing process, as well as the often high temperatures on a printed circuit board. Fill the insulation with holes, and the whole chip might collapse. The second problem is making air gaps compatible with standard chip-fabrication techniques. Despite the performance gains that companies have realized on their test chips with air gaps, added equipment and exotic materials have canceled out the performance gain with a money drain.

37 - 37- Which of the following statements is NOT true?

- 1) by reducing the size, transistors become faster and wires become slower.
- 2) heat transform is not crucial in microchip design.
- 3) by extra power for transistors, signals can pass faster through short wires.
- 4) today, speed of a microchip is limited by its wire rather than its transistors.

38 - 38- Vacuum insulator ...

- 1) has never been used by chip manufacturers.
- 2) does not prevent signals from leaking.
- 3) is costly.
- 4) has low performance.

39 - 39- Which of the following statements is TRUE about Edelstein?

- 1) he believed that the transistor was everything.
- 2) he invented the basic rule of thumb in microchip world.
- 3) he was against the basic rule of thumb for chip speed.
- 4) in 1990 he was with IBM company.

Passage 11

The basic approach to the design of any practical control system will necessarily involve trial-and-error procedure. The synthesis of linear control systems is theoretically possible, and the control engineer can

resulting standards developed as a result of widespread implementation. No better model of a standards process has yet emerged that is as dynamic and agile to allow more direct involvement by industry.

7. Why the roles of the participants in developing internet standards have come under closer scrutiny?

- 1) Because the financial implications become more significant as internet continues to grow
- 2) Because now many countries have fundamental interests in the internet evolution
- 3) Because internet was intended for the use of research community
- 4) Because it must come from research community

► Exercise 7 (EE 84)

It has been more than two decades since the personal listening device forever changed family dynamics, by making fights over the car stereo an anachronism. By year's end, Toshiba Corp. hopes to further the cause of domestic harmony by introducing a thumb-sized fuel cell that it says can power an MP3 player for 20 hours on a single ampoule of methanol. A 5.6-centimeter, 8.5-gram prototype, said to be the world's smallest, puts out about 100 mill-watts. Toshiba is working to increase the fuel cell's power output by the end of this year so it can be incorporated in a host of portable electronics, such as laptop computers and handheld videogames.

8. In which of the following devices will the thumb-sized fuel cell be introduced by Toshiba by the end of the year?

- | | |
|-------------------------|------------------------|
| 1) MP3 player | 2) Laptop computers |
| 3) Portable electronics | 4) Handheld videogames |

► Exercise 8 (EE 86)

WiMedia, the next generation of wireless connectivity, is raising some interesting questions about privacy.

WiMedia, which underlies consumer technologies such as Certified Wireless USB and the planned next iteration of Bluetooth, is based on the concept of ultrawideband radio. It uses short-range, very-low-power signals transmitted across a vast expanse of the radio spectrum - from 3.1 to 10.6 GHz. Traditional radio, on the other hand, uses a much higher-power signal across a narrow band of spectrum.

In the United States, the authority to regulate use of the radio spectrum falls to the Federal Communications Commission (FCC). U.S. courts have consistently ruled that the federal government has the power to regulate the airwaves, because radio is interstate commerce. But can the FCC really claim jurisdiction over the minuscule power levels used by WiMedia radios?

The answer to the question is important because the FCC restricts what radio broadcasters, whether licensed (as in the case of radio or TV stations) or unlicensed (as in the case of the millions of people who own Wi-Fi base stations), can do. On many licensed radio services, encryption is not allowed, as a condition of licensing. Amateur radio operators, for example, have never been allowed to send encrypted traffic; they would lose their licenses if they did.

In contrast, concerned that users be able to trust their own wireless systems, the coalition of electronics companies behind WiMedia - the WiMedia Alliance - demands that all ultrawideband radio systems sold

Passage 9

Traditional behavior-based systems detect a sudden increase in traffic volume at the customer link and promptly alert the operator. Of course, this is just the start of an extended cat-and-mouse game. Attackers then devise new and clever methods to fly under the radar and avoid detection. Some intruders, for example, strive to consume the resources of a Web server located within the victim's network. They don't need to flood the server with traffic. Instead, they simply identify the Web pages that are the biggest drain on memory and CPU time—ones containing video clips, for example—and coordinate their armies to request frequent access to those pages only.

In such a case, the overall volume of traffic into the network looks normal, yet the attack is effective because it degrades or even chokes off service. Similarly, a flood of spam messages, for example, can overwhelm a mail server. It might seem like such a flood would unavoidably trigger a detection system. But that's not always the case. The load on the server depends on the number of messages, not the quantity of data, which is what the detection system is measuring. If a spam attack is written so that each spam message consists of only a few data packets, then the overall traffic never rises to the threshold level. Internet telephony spam can similarly clog a network.

Many network operators have responded to these sorts of attacks by lowering the threshold of their behavior-based systems in an attempt to detect more subtle changes in traffic volume. This threshold change, however, tends to create false positives, in which the system often mistakenly takes nonmalicious fluctuations in the volume of traffic to be an attack. Such fluctuations are common; think of the flood of traffic that ensues when a Web page on a site with modest traffic is cited on a popular bulletin-board site such as Slashdot or Digg. The problem is that such false positives prevent operators from trusting the system, forcing slow and expensive case-by-case human intervention.

To avoid false positives, security software needs to monitor Internet traffic across the entire network, as opposed to a single link at a single time, and then correlate all the events it detects. Only then can a model of the traffic behavior on the entire network be created, allowing security algorithms to focus on the structure and composition of the traffic and not just its volume. In other words, a security system must monitor the actual entropy of the network itself.

- 33 - Who are described as cat and mouse in the cat-and-mouse game?
 - 1) attackers and security systems.
 - 2) intruders and victim networks.
 - 3) attackers and intruders.
 - 4) malicious and worms.
- 34 - The detection system....
 - 1) measures number of messages.
 - 2) measures quantity of data.
 - 3) measures number of request for access to a workstation.
 - 4) does not measure number of data packets.
- 35 - How do behavior-based systems attempt to detect an Internet telephony spam?
 - 1) through reducing traffic threshold.
 - 2) by case-by-case human intervention.
 - 3) by monitoring Internet traffic.
 - 4) through lowering false positives.

under the WiMedia banner be capable of strong hardware encryption and that for some applications, using this encryption capability be mandatory.

So far, FCC regulations that deal with ultrawideband technologies have made no mention one way or the other of the use of encryption. But could the federal government use the authority of the FCC to enforce a law requiring that all ultrawideband transmissions be in the clear? It's not such a preposterous idea: the government's hostility to encryption was demonstrated in the 1990s, when it tried to restrict the use of Internet-based encryption technologies. In the end, the borderless nature of the Internet caused the government to admit defeat. There is no such obstacle to controlling low-power radio, however.

9 _ What is meant by WiMedia?

- 1) WiMedia is the next generation of wireless connectivity based on the concept of ultrawideband radio
- 2) WiMedia is the next generation of wireless connectivity that is banned by the FCC
- 3) WiMedia is the next generation of wireless connectivity that uses high power signal across the radio spectrum
- 4) WiMedia is the next generation of wireless connectivity contradicted by the FCC



In some cases, one of the choices gives more information than others. Since you should chose the **best answer** (not the correct one), read the passage to have enough information to decide which of these two choices is the best answer.

► (Exercise 9 (EE 83)

In the past, the major concerns of a VLSI designer were area, performance, cost, and reliability; power considerations were mostly of only secondary importance. In recent years, however, this has begun to change and, increasingly, power is being given comparable weight to area and speed in VLSI design.

10 _ The major concerns of a VLSI designer

- 1) only include cost and reliability
- 2) are restricted to performance and cost
- 3) cover factors such as power, area, and reliability
- 4) include power consumption, area, performance, cost, and reliability



One important technique related to restatement questions is playing the words. It is used frequently to distract the test taker and draw his/her attention away from the correct answer. In the playing the words the structure of the target sentence, its pronouns or some of its words are changed.



In the playing the words technique be careful about **synonyms** in the target and the correct answer.

- 28 - What makes quantum computer more powerful than today's supercomputers?
- 1) quantum bit.
 - 2) parallel processing.
 - 3) fuzzy property of the qubit.
 - 4) encryption schemes.
- 29 - Why building an electrical current scalable quantum computer is postponed? Because...
- 1) currents corrupted quickly.
 - 2) scalability is difficult.
 - 3) the alignment is too hard.
 - 4) you need to make qubits on a multilayered chip.

Passage 8

A photon transistor would work in a similar fashion as electronic transistor. Two beams of light would enter the device. One, which could be as weak as a single photon, carries the signal to be amplified. The other would carry the light to be modulated by the signal. An amplified light signal would then exit the device.

Amplifying a light signal is inherently much more difficult than amplifying an electrical one. Unlike electrons, which have negative charge and interact easily with matter and each other, photons in a beam of light are electrically neutral and do not interact much with matter. A photon is also typically not affected by another beam coming into its path.

A promising way to get light to interact with matter and itself is to create what physicists call a surface plasmon. Surface plasmons form at the junction between a nonconducting material, or dielectric, and a metal. Metals have lots of free electrons, which oscillate when light shines on them. But when a dielectric borders a metal, the movement of the electrons is curtailed, because electrons cannot enter the dielectric. That forces the jiggling electrons to move in waves of density—like sound—along the junction. In theory, surface plasmons offer a way to create a transistor by using one beam of light falling on the metal to modulate another beam through electromagnetic interaction. But in practice it has proved to be quite difficult, because surface plasmons do not interact well with optical fibers, which are typically used to feed light to the metal and dielectric junction. Most other sources of light fare no better.

- 30 - Light amplification is difficult because...
- 1) photon transistor is not a good amplifier.
 - 2) photons are neutral.
 - 3) photons do not interact much with each other and also with different matters.
 - 4) amplifying a light signal is inherently much more difficult than amplifying an electrical one.
- 31 - Lights interact each other ...
- 1) electromagnetically.
 - 2) by sources of light.
 - 3) through optical fibers.
 - 4) by electronic transistor.
- 32 - In a photon transistor, surface Plasmon is located between ...
- 1) two fiber optics.
 - 2) a dielectric and a metal.
 - 3) metals.
 - 4) the light to be modulated and the one carries the signal to be amplified.

► Exercise 10 (CE 81)

Who would have thought that not only computers, but computer science would become a centerpiece of pop music culture? Or that UNIX path punctuation would become a vernacular element of advertising (in the form of web address)? The public has often warned to the surface of science and engineering, but never before to the depth. While there are tens of millions of people who love dinosaurs, how many of them have gone on analyzed spectrum data? When it comes to computers, though, a mass culture of technical literacy is being born, especially among children. We always thought computers had to become popularized and instead the public has decided to become surprisingly technical.

This is due in part to the stalwart marketing of awkward software by Microsoft and in part to be economic pressures favoring open system, which will always have rougher edges. But those cannot be the only reasons. There is an emotional draw. Maybe it's the ability to control a micro-world that is more predictable and less filled with pain and ambiguity than real life, an abstract aquarium, a theater of numbers.

11 _ Which of the following statements describes Microsoft practices best? Microsoft....

- 1) sells its software awkwardly
- 2) awkwardly advertises its stalwart software
- 3) strongly and bravely advertises its clumsy software
- 4) awkwardly advertises its great software

► Exercise 11 (EE 82)

The quality of communication that takes place in an organization is greatly affected by the overall design of that organization. There can be quite a difference, for example, between an organization that groups people according to their professional specialty, such as accounting, engineering, or sales, and one in which each unit is a self-contained team having the various specialists needed to produce a certain product or to serve clients in a given geographical area.

12 _ The overall design of an organization....

- 1) makes a lot of difference in the quality of communications in the organization
- 2) is highly influenced by the quality of communications in the organization
- 3) greatly affects the quantity of communications within the organization
- 4) takes place in an organization according to professional specialty



Sometimes in the restatement questions, synonyms of words in the target sentence are used instead of keywords in the question. It makes finding the target sentence more difficult.

According to Intel, without a high-k dielectric, chips made just three to five years from now would be throwing off 200 W. But a thicker, leakproof layer of high-k dielectric can do the same job in the transistor as the leaky sliver of silicon dioxide, and it will cut the power dissipation in half while allowing for faster-switching transistors. But even that innovation does no more than buy a few years' time on the semiconductor industry road map.

- 23 - What will be the big switch in power dissipation?
- 1) siphoning heat from chips.
 - 2) soon be in the offing.
 - 3) using high-k dielectrics.
 - 4) replacing CMOS with bipolar transistors.
- 24 - Which of the following is the prevalent insulator?
- 1) hafnium dioxide.
 - 2) silicon dioxide.
 - 3) high-k dielectric.
 - 4) none of the above.
- 25 - Which of the following statements is NOT true?
- 1) the only advantage of high-k dielectric is power dissipation reduction.
 - 2) vertical leakage result in power's wasting.
 - 3) CMOS dissipate less power than bipolar transistor.
 - 4) without new solutions, chips may consume even 200W.
- 26 - What does the author conclude?
- 1) high-k dielectrics will be dominated in semiconductor industry very soon.
 - 2) power goes to waste by vertical leakage.
 - 3) silicon dioxide has many shortcomings.
 - 4) high-k dielectric is not the ultimate solution.

Passage 7

A quantum computer would surpass even today's supercomputers by being able to crack encryption schemes or simulate quantum physics in far less time. The key to its power is the quantum bit, or qubit, which is not limited to representing 0 or 1. Qubits exist in fuzzy states that are both 0 and 1, and can be combined to represent many numbers at once. As a result, a quantum computer would be like a massively parallel computer array, whose power grows exponentially with each additional qubit.

One way to construct a scalable quantum computer that could handle thousands of qubits rather than just a few would be to turn electrical currents into qubits. But this approach has lagged, because the currents degrade fairly rapidly. Ions, by contrast, are extremely stable and have been used to demonstrate the fundamentals of quantum computation. But ion traps haven't been very scalable, because they had to be assembled one by one. "When you have thousands of electrodes, you can't hand-assemble it; the alignment is too hard," says ion trapper Christopher Monroe of the University of Michigan, in Ann Arbor. "You really need to make it on a multilayered chip."

- 27 - If there are twice as many qubits in a quantum computer, its computational power...
- 1) remains the same.
 - 2) will be doubled.
 - 3) will be fourfold.
 - 4) will be decreased.

► Exercise 12 (CE 82)

Go To surveys the history of modern software, from the creation of the first successful high-level language, FORTRAN and its compiler in the 1950s, through the open source movement of today. The development of UNIX and C, the rise of graphical user interface and the creation of the spreadsheet are included among the events that shaped modern computing. Although some will argue with choices of topics covered - for example an entire chapter is devoted to Java, while no mention is made of the development of the internet protocol- Go To is full of fascinating details about an intangible creation that has had a very tangible impact on the modern world.

13 - What topic missing in Go To?

- | | |
|-------------------------------------|------------------------------------|
| 1) Java | 2) Fascinating details |
| 3) Development of internet protocol | 4) Development of modern computing |

► Exercise 13 (EE 83)

Invent Resources, known as IR, is an inventions-on-demand company made of a quartet who got the idea to join forces for invention of new products. IR's trademark is the breadth of knowledge, disciplines and personalities - its four principals bring to the table, comprised of a physicist, an MIT educated engineer, another MIT physicist and medical technology specialist, and a University of London mathematician.

Usually, a company will approach IR with a concept, which IR then brainstorms on its own time. If the partners come up with a solution, they will describe that idea to the client after first executing a confidentiality agreement. That way, if the client declines the proposed solution, IR can market it elsewhere. If the client decides that IR should press ahead and design a viable product, both sides sign a contract granting patent ownership to IR and exclusive licensing rights to the client. The licensing agreement itself isn't usually executed until years later, after the product has been developed and tested and is ready for launch.

In the development phase, IR can supply the client with engineering and circuit diagrams, assembly drawings, and parts lists. Most important, IR creates the proof-of-principle device, a working model that functions properly but doesn't necessarily look like the final product. The client takes this model to an industrial design firm that will create the final look. If the product is canceled at any time during this period, the exclusive rights revert back to IR.

Until the formal licensing agreement is executed, the client pays IR a monthly retainer or "standstill fee" of \$4000 to \$8000 that prevents IR from offering that product or developing a similar one for another client. These cumulative fees are ultimately deducted from the license fee, a one-time charge of 1 percent of the projected product revenue in its third or fifth year of sales, when the product should reach market-place maturity. Usually, the stand-still fees end up exceeding the license fee, so only in rare cases does IR collect a license fee.

14 - A contract is drawn up in case ...

- 1) the client declines the proposed solution
- 2) the client gives the company the go ahead signal
- 3) the client decides that IR should publish the product
- 4) the company presses ahead and designs a viable product

magnitude of problem is often ignored. School projects often end up being several thousands of lines of code. There are software products with 10,000 line designs that are given away by their design. We have long since passed the point where simple software is of much interest. Typical commercial software products have designs that consist of hundreds of thousands of lines. Many software designs run into millions. Additionally, software design are almost always constantly evolving. While the current design may only be a few thousand lines of codes, many times that may actually have been written over the life of product.

18 _ What does the paragraph preceding this passage most probably discuss?

- 1) what makes a software design easy to create.
- 2) what makes simple software designs distinct from complex ones.
- 3) the reason why source code is used in development of softwares.
- 4) an outcome originated from the same source as mentioned in paragraph one.

19 _ The word *that* in the first paragraph refers to....

- 1) software module.
- 2) debugging a software.
- 3) effort required to write a typical software.
- 4) time taken to write a school software.

20 _ Why does the author mention school projects? To...

- 1) support the point in a previous sentence.
- 2) show the inefficiency of school curriculums.
- 3) prove that software designs tend to become complex.
- 4) demonstrate the need for an early start in computer software design.

21 _ The word *nevertheless* in the first paragraph is closest in meaning to....

- 1) still.
- 2) likewise.
- 3) no matter.
- 4) in as much as.

22 _ What does the author imply about software products typically used in business companies? They...

- 1) all enjoy the same level of complexity.
- 2) have reached their apex of development.
- 3) are far from being simple or easy to create.
- 4) require a level of complexity not yet well understood.

Passage 6

While some researchers focus on siphoning heat from chips, another group is constantly striving to minimize it in the first place. The biggest such improvement was the switch to CMOS from bipolar transistors in the late 1980s, and another big switch may soon be in the offing. In the last couple of years, major chip makers have been working on materials, such as hafnium dioxide, called high-k dielectrics. This class of materials saves power by essentially eliminating "vertical leakage"—that is, the seepage of current through the insulating layer on a transistor's gate, the part that turns it on and off.

The reason for such leakage is that as transistors shrink, the insulator—until now, silicon dioxide—has had to slim down, too, in order to maintain its electrical performance. But now it is only a few atomic layers thick. At those dimensions, there's no way to keep charge in the gate from tunneling through the insulator and, as a result, power goes to waste.

15 - Why is a monthly retainer fee paid to IR, which at times surpasses the license fee? To...

- 1) keep the rights of the product
- 2) prevent marketing of the product by IR
- 3) prevent the development of the product by IR
- 4) prevent IR from proposing the product to another customer

► Exercise 14 (EE 84)

The electronic system of the future will monitor itself, change the functions it performs, and repair its damaged circuits - all without external intervention. Such is the dream of autonomic computing. Although the dream is not yet a reality, engineers and scientists have taken a big step forward with the development of an on-chip fuse that is electrically blown - or programmed - by using a physical effect that is usually considered to be a serious reliability problem in semiconductor circuits.

According to the main developer, combining the new eFuse technology with already available on-chip built-in self-test and self-repair circuitry would yield a chip capable of diagnosing its failures and then fixing them by blowing fuses to reroute its circuits. The built-in self-test circuitry determines which parts of the chip do not work properly and sends the information to the self-repair circuitry which figures out what fuses to open in order to replace the failed circuits with spare, redundant ones.

For several generations of semiconductor process technologies, fuses and redundant circuits have worked hand in hand to repair chips and increase the number of usable chips on a wafer. They are particularly important in chips with embedded DRAMs, in which cutting of fuses allows extra rows or columns of memory cells to replace damaged ones. However, the fuses are cut from outside the chip by using laser slicing through metal lines placed on the chip's topmost layer. The drawback is that this process is a lengthy and costly one.

16 - According to the above text, the future generation of electronic systems will be able to do

- 1) self-repair without using any fuses
- 2) self-repair without using any spare parts
- 3) self-repair without needing any external command
- 4) self-repair without having any serious reliability problems

17 - According to the text, fuses and redundant circuits...

- 1) are put into work by hand
- 2) are important for diagnosing faults
- 3) are external circuitry of modern chips
- 4) are necessary to replace damaged memory cells

► Exercise 15 (CE 80)

Reducing test application time and test size is highly desirable for several reasons. It minimizes the overall costs incurred in fabricating and testing many chips that implement a specific design. Small test sets are also necessary because testers have a fixed memory size will require repeated loading of the tester memory which is an expensive process. The cost of applying a test set increases with the number of tester

- 13 _ The verb *seep out* in the third paragraph is closest to which of the following verbs in the above passage?
- 1) slipping out in the fourth paragraph.
 - 2) panned out in the fourth paragraph.
 - 3) doped in the first paragraph.
 - 4) conduct in the second paragraph.
- 14 _ The paragraph following the passage would most likely be about?
- 1) HEMT integrated circuits.
 - 2) gate insulator for gallium arsenide.
 - 3) silicon dioxide.
 - 4) a promising material.

Passage 4

Ever since computers were invented, it has been natural to wonder whether they might be able to learn. Imagine computers learning from medical records to discover emerging trends in spread and treatment of new diseases, houses learning from experience to optimize costs on the particular usage patterns of their occupants, personal software assistants learning the evolving interests of their users to highlight specially relevant stories from the online morning news papers.

- 15 _ The best topic for this passage would be....
- 1) future of E-learning.
 - 2) goals of Artificial intelligence.
 - 3) treatment of new diseases in the future.
 - 4) optimization of energy costs related software.
- 16 _ According to the passage, which of the following statements is True?
- 1) houses learn to minimize the efficiency of energy usage.
 - 2) it is possible to use relevant stories from online morning newspapers to evolve interests of their readers.
 - 3) right after the invention of computers, people questioned if it could learn on its own.
 - 4) medical discoveries, energy optimization, and readers interest understanding are only few things computers are able to do at present time.
- 17 _ The word occupant is closest in meaning to...
- 1) inhabitant.
 - 2) advocator.
 - 3) consultant.
 - 4) firm.

Passage 5

Another consequence of considering source code as software design is the fact that a software design is relatively easy to create, at least in mechanical sense. Writing (i.e., designing) a typical software module of 50 to 100 lines of code is usually only a couple of day's effort (getting it funny debugged is another story, but more on that later). It is tempting to ask if any other engineering discipline that can produce designs of such complexity as software in such a short time, but first we have to figure out how to measure and compare complexity. Nevertheless, it is obvious that software design gets very large rather quickly.

Given that software designs are relatively easy to turn out, and essentially free to build, an unsurprising revelation is that software design tends to be incredibly large and complex. This may seem obvious but

cycles needed to apply the test set. Hardware modifications like full or partial scan ease the task of test generation but they significantly may increase the test application time. This increase is mainly due to extra tester clock cycles needed to load specific logic values into scan flip-flops (FF's) and observe circuit response collected in the scan FF's.

18 - What factor is the most influential one in increasing the test application time?

- 1) the passage does not derive any conclusion
- 2) observing circuit responses collected in the scan FF's
- 3) extra tester clock cycles needed to load specific logic
- 4) applying the test sets and checking the responses

9 _ What is Razavi's solution for power consideration in RF transceivers? Using...

- 1) multiple transmitter circuits in a chip.
- 2) transmitter and receiver over a distance of 10 meters.
- 3) larger transistors.
- 4) multiple receiver circuits on a chip in parallel.

Passage 3

High-electron-mobility transistor, or HEMTs are remarkable devices because they overcome a fundamental problem of solid-state physics. Semiconductors, as their name implies, normally don't conduct electricity all that well. Usually, they must be doped with other kinds of atoms to become electrically conductive. But those impurities tend to interfere with the movement of electrons through the semiconductor's crystal lattice, limiting the conductivity that can be obtained.

In HEMTs, electrons are introduced into a III-V semiconductor not by doping but by placing the material in contact with another III-V compound that is doped. In essence, electrons fall a short distance into the undoped material, allowing a thin layer of it—the channel—to conduct electricity extremely well whenever the transistor is switched on.

HEMTs can be used singly or in integrated circuits with, say, 100 or even 1000 of them clustered together, but they can't yet work for microprocessors. The problem is that too many of the electrons that are supposed to flow through the channel from the transistor's source electrode to its drain instead seep out the controlling input electrode—the gate—creating heat. With millions of leaky transistors crowded together on the same chip, things would quickly get hot enough to melt.

In a silicon MOSFET, a layer of intervening insulation (traditionally silicon dioxide) prevents electrons from slipping out of the channel into the gate. In a HEMT, the channel is separated from the gate by a semiconductor, which, as you might expect, is somewhat conductive. What's needed here, of course, is an insulator, but for decades there have been no good gate insulators available for gallium arsenide. From time to time over the years, researchers seem to uncover a promising material, but nothing ever really panned out—until recently.

10 _ What is the fundamental problem of solid-state physics?

- 1) dependency to impurities.
- 2) irregular semiconductor's crystal lattice.
- 3) solid-state devices cost a lot.
- 4) conductivity limitation.

11 _ HEMT conducts electricity well because....

- 1) of a III-V compound semiconductor.
- 2) electrons pass through a short distance channel.
- 3) electrons flow through an undoped material.
- 4) all of the above.

12 _ Why HEMTs can not be used in microprocessors? Because...

- 1) they are very bulky.
- 2) they are very costly.
- 3) of heat restriction.
- 4) of power considerations.

Lesson 5

Inference Questions

Lessen four described restatement questions in which the target sentence is stated in the passage. The only thing which you should do is to find this target and compare it with the four choices. However, there is another type of question called *inference* question. This type of questions deal with what can be inferred from the passage- what is not directly stated there but is understood. A good reader is expected to understand the inference, and to see what is implied.

Certain strategies can be used to try and determine what can be inferred from the passage. The most obvious help we get is from the context, the whole group of sentences, which can guide us toward the answer.

XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
??? ??? XXXXXX XXXXXX XXXXXX
XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
XXXXXX XXXXXX XXXXXX XXXXXX ??? ???
XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX



This type of question is the most difficult one. If you do not understand the whole passage and are not sure about the correct answer, do not answer this type of question.

► Consider the following sentence.

“In 1896 the fabulously wealthy John D. Rockefeller declared that the great university he had founded was the best investment he had ever made in his life.”

► *Example 1:* What can be inferred from the sentence?

- 1) John D. Rockefeller was richer than the vast majority of his fellow Americans.
- 2) Rockefeller was delighted with the university he had founded.
- 3) Rockefeller had made other investments in his life.
- 4) In 1896 Rockefeller was the richest man in the world.
- 5) Rockefeller made a large capital investment when he founded his university.
- 6) Rockefeller's career was full of successful investments.

5 -5- The cell's conversion efficiency is obtained by...

- 1) dividing output illumination energy by cell's maximum power input.
- 2) dividing cell's maximum power output by input illumination energy.
- 3) multiplying spectral-mismatch factor by maximum output power.
- 4) dividing input illumination by output illumination.

6 -6- The word *hue* in the third paragraph probably means...

- 1) illumination.
- 2) frequency.
- 3) color.
- 4) intensity.

Passage 2

Millimeter-wave radios, those operating at 30 GHz and above, have been available for many years. But because of the high frequencies involved, they were built from costly, difficult-to-integrate gallium arsenide. Packaging the chips and connecting them to an antenna without losing most of the signal added to their cost.

Only recently has a millimeter-wave silicon radio in a cheap package even seemed possible. "When we first talked about doing this in silicon, people laughed at us," says Brian Gaucher, who headed IBM's millimeter-wave radio effort at the Thomas J. Watson Research Center, in Yorktown Heights, N.Y. Actually, IBM does not use silicon alone. Rather, it uses a high-speed alloy of silicon and germanium. IBM's latest silicon-germanium technology makes transistors that can switch at a rate as fast as 200 GHz. Gaucher and his colleagues built separate transmitter and receiver chips with antennas incorporated right into the plastic package, eliminating the need for signal sapping interconnects and economizing on packaging. The chips communicated at 630 megabits per second over a distance of 10 meters.

UCLA electrical engineering professor Behzad Razavi is taking a different approach from IBM's. He's making key parts of his transmitters and receivers using 130-nanometer and 90-nm silicon CMOS manufacturing technology—mature chip-making processes used today to make microprocessors. There could be two advantages to this. First, the process technology is now so common and widespread that the chips that result will no doubt be cheap. Second, as the many millions of transistors on a microprocessor attest, CMOS lets you integrate a lot of devices on the same chip. "If I can put one antenna on a chip, I can put on four," says Razavi. And CMOS transmitters at 60 GHz will need all the antennas they can get. As individual transistors get smaller, they will be less able to handle the power required for RF transmission. So it is possible to put multiple transmitter circuits on a chip in parallel.

7 - Why gallium arsenide has not been used in today Millimeter-wave radio applications? Because...

- 1) it is costly.
- 2) it can not be integrated too much.
- 3) it loses so much signals.
- 4) all of the above.

8 - Why does IBM's millimeter-wave radio seem to be commercialized? Because they...

- 1) used silicon germanium rather than gallium arsenide.
- 2) did not use signal sapping interconnects.
- 3) used plastic package.
- 4) all of the above.

Read the following passage and then say which of the four answers (A), (B), (C) or (D) can be inferred from it.

► As trees grow old they add a new ring for each year; this discovery, it seems, was first made by Leonardo da Vinci, the famous Italian painter and scientist. It took a long time, however, before the serious study of tree rings started; this was done in Arizona by Andrew Ellice tt Douglas .

Douglas developed a simple technique for dating trees called cross-dating and for a period of over 20 years continued the study of tree rings. He spent much of his time in logging camps near Flagstaff .

The Douglas method has been used by many scientists. Some of them used it to examine logs in Indian pueblo ruins; they were able to date the buildings right back to the tenth century. Others used it to date the world's oldest living trees, the bristlecone pines.

► *Example 2:* What can be inferred from the first paragraph?

- 1) Leonardo made many discoveries.
- 2) Leonardo was famous as a painter
- 3) Leonardo was interested in the aging process.
- 4) Leonardo became famous because of his tree ring discovery.

► *Example 3:* What also can be inferred from the first paragraph?

- 1) Leonardo started the serious study of tree rings.
- 2) Leonardo's discovery was not developed for many years.
- 3) Tree rings were studied in Arizona for a long time after Leonardo.
- 4) Douglas was a famous Arizona scientist.

► *Example 4:* What can be inferred from the second paragraph?

- 1) The term cross-dating was invented by Douglas.
- 2) An uncomplicated method of tree-dating was discovered by Douglas.
- 3) It took Douglas 20 years to develop a tree-dating technique.
- 4) The technique of cross-dating was developed near Flagstaff.

► *Example 5:* What also can be inferred from the second paragraph?

- 1) Logging camps are good places for studying tree rings.
- 2) Douglas spent 20 years near Flagstaff.
- 3) Douglas spent most of his life studying tree rings.
- 4) There are courses for studying tree rings near Flagstaff.

► *Example 6:* What can be inferred from the last paragraph?

- 1) The Douglas method has been used since the 10th century.
- 2) Indians used the Douglas method to examine logs.
- 3) The earliest known trees can be dated by the Douglas method.
- 4) Indians used bristlecone pines to construct their buildings.

► *Example 7:* What also can be inferred from the last paragraph?

- 1) American Indians lived in the region investigated nearly a thousand years ago.

Supplimentary Tests

Passage 1

You might think that measuring a solar cell's efficiency is simply a matter of shining sunlight on it and recording how much electricity comes out. But it's more complicated than that.

For starters, testers tend not to use actual sunlight to measure efficiency, because the amount of light can vary from day to day and place to place. Instead, they replicate sunlight using an artificial light source that they carefully calibrate and characterize. The key variables are the intensity of the illumination and its color balance. The standard level of illumination is 100 milliwatts per square centimeter (or 1000 watts per square meter, which is roughly equal to full sunlight hitting the Earth's surface). This, along with a precise definition of the cell's area, controls how much raw energy the device receives during testing.

Getting the color balance right is more about measuring how wrong it is, because no light source has the same spectrum as sunlight. To start, the tester measures the deviation of the light source from a standard solar spectrum. Then, to understand how that deviation will affect the test cell, he or she determines the experimental cell's sensitivity to different hues of light—that is, its spectral response. The power output from the cell is measured one wavelength at a time, using monochromatic light generated by a spectrometer. Once the spectrum of the light source and the spectral response of the cell have been obtained, the tester can calculate what's called a spectral-mismatch factor, which expresses how much a given light source will under- or overestimate the cell's capacity to convert sunlight into electricity.

Power output is determined by exposing the cell to the calibrated light source and measuring the current produced as a function of the voltage on the circuit. The optimal combination of voltage and current—corrected for spectral mismatch—represents the cell's maximum power output. Divide by the energy of illumination the cell received and you've got the cell's conversion efficiency.

- 1 - The above passage mainly discuss about...
 - 1) different ways of measuring a solar cell's efficiency.
 - 2) importance of high efficient solar cells in practical applications.
 - 3) obstacles to the measuring a solar cell's efficiency.
 - 4) definition of solar cell's efficiency.
- 2 - Artificial light source is used instead of actual sunlight to measure the efficiency because...
 - 1) the amount of sunlight varies by time and place.
 - 2) artificial light can be carefully calibrated.
 - 3) during the test process, characteristics of artificial light can be adjusted.
 - 4) all of the above.
- 3 - The amount of raw energy the device receives during testing is determined by...
 - 1) standard level of illumination.
 - 2) cell's area.
 - 3) measuring the produced current.
 - 4) area of the cell and illumination in intensity.
- 4 - Spectral response of a solar cell...
 - 1) means sensitivity of it to different hues of light.
 - 2) can be obtained by calculating spectral-mismatch factor.
 - 3) expresses conversion rate of sunlight into electricity.
 - 4) represents the cell's maximum power output.

- 2) The Douglas method can be used to date all 10th century ruins.
- 3) Scientists dated the bristlecone pine to the tenth century.
- 4) The Indian pueblo ruins were not as old as the bristlecone pines.



In an inference question, choices mentioned in the passage have lower priority. Because answer of an inference question is not stated in the passage and you should infer it from the passage.

► Exercise 1 (EE 82)

In the 1700's, Benjamin Franklin, Alessandro Volta, Luigi Galvani, and other early thinkers sought to understand the nature of an unseen, unnamed energy. Their test materials consisted of such things as kites, frogs' legs, zinc, and salt water. But their findings allowed pioneers in the 1800s – Ampere, Faraday, Ohm, and Oersted- to discover the electrical properties known as charge, resistance, potential, and current, and the dynamics among them....

1 _ Why did not Franklin, Volta and Galvani conduct tests in an electricity lab? Because...

- | | |
|--|---|
| 1) electricity was unknown on their time | 2) they were poor and could not use a lab |
| 3) electricity could not be seen by them | 4) there was no name for electric energy |



Inference questions usually look like this:

- It can be inferred from the passage that....
- It can be deduced from the passage that....
- What does the passage imply?
- Which of the following statements would best explain what the passage reveals?
- What can be inferred about...?
- Which of the following statements is most likely true about....?
- What probably occurred after....?
- As we understand from the passage....
- Which of the following statements most accurately reflects the author's opinion about....?

معنی گزینه‌ها عبارتند از:

- | | | | |
|--------------|---------------|---------------|---------------|
| ۱- یکسو کردن | ۲- نرمال کردن | ۳- تبدیل کردن | ۴- معکوس کردن |
|--------------|---------------|---------------|---------------|

۱۶- گزینه ۱ درست است.

معنی گزینه‌ها عبارتند از:

- | | | | |
|-----------|---------|--------------|-----------|
| ۱- ابتکار | ۲- سرعت | ۳- نفوذپذیری | ۴- مقاومت |
|-----------|---------|--------------|-----------|

۱۷- گزینه ۲ درست است.

معنی گزینه‌ها عبارتند از:

- | | | | |
|---------------|---------------|----------------|---------------|
| ۱- جبران کردن | ۲- تدبیر کردن | ۳- ممانعت کردن | ۴- نوسان کردن |
|---------------|---------------|----------------|---------------|

۱۸- گزینه ۴ درست است.

باتوجه به عبارت صرفنظر کردن (neglect) گزینه ۴ درست است.

معنی گزینه‌ها عبارتند از:

- | | | | |
|----------------|--------------|-----------|---------------------|
| ۱- پلاریزاسیون | ۲- شارژ کردن | ۳- اعمالی | ۴- حاشیه‌ای و کناری |
|----------------|--------------|-----------|---------------------|

۱۹- گزینه ۲ درست است.

معنی گزینه‌ها عبارتند از:

- | | | | |
|---------|---------|---------|-----------|
| ۱- بصری | ۲- مرئی | ۳- نوری | ۴- درخشان |
|---------|---------|---------|-----------|

۲۰- گزینه ۳ درست است.

معنی گزینه‌ها عبارتند از:

- | | | | |
|---------|---------------|----------|--------------|
| ۱- معلق | ۲- منحرف و کج | ۳- مستعد | ۴- توزیع شده |
|---------|---------------|----------|--------------|

► Exercise 2 (CE 79)

There's a myth that if we were really good at programming, there would be no bugs to catch. If only we could really concentrate, if only everyone use structured programming, top-down design, decision tables, if programs were written in SQUISH, if we had the right silver bullets, and then there would be no bugs. So goes the myth. There are bugs, the myth says, because we are bad at what we do; and if we are bad at it, we should feel guilty about it. Therefore, testing and test case design is an admission of failure, which instills a goodly dose of guilt. And the tedium of testing is just punishment for our errors. Punishment for what? For being human? Guilt for what? For failing to achieve inhuman perfection? For not distinguishing between what another programmer thinks and what he says? For failing to be telepathic? For not solving human communications problems that have been kicked around for forty centuries?

2 - It can be inferred from the passage that.....

- 1) the author is not a good programmer
- 2) human communications problems have not been solved yet
- 3) the author feels guilty about not being telepathic
- 4) any kind of bug can be detected through testing



In inference questions, an answer choice may be incorrect because it:

- Is not supported by the information stated or implied in the passage.
- Restates information from the passage but does not answer the question.
- Is too general or vague.
- Is inaccurate or untrue according to the passage.
- Is irrelevant or not mentioned in the passage.

► Exercise 3 (CE 83)

It turns out that your kids are right once again. According to a recent report in Nature, playing video games of the kill-or-be-killed variety is good for their brain-power. Not only that: if they are playing these games on the Sony Playstation 2, while you got them last Christmas and get bored with Tony Hawk's ProSkater 4, your kid and his or her closest 99 buddies can bundle their PS2s together and do their quantum chromodynamics homework.

This second bit of news - using Sony Playstations to build a specialized supercomputer - was announced by researchers at the National Center for Supercomputing Applications and the computer science department at the University of Illinois in Urbana. These tinkers paid about \$50,000 and got computing power that would otherwise cost at least five times as much. They wanted to learn if the sophisticated graphics processor used in the Sony Playstation to run slick games could also be used to solve big problems in particle physics.

While hardly a threat to supercomputing giants like IBM, the achievement illustrates the point that consumer electronics has now become a leading edge of the computer industry. Advances are no longer

باتوجه به عبارت پیشرفت سریع (Rapid development) گزینه ۳ درست است.

۷- گزینه ۱ درست است.

کلمه notion به معنی تصور و مفهوم است بنابراین گزینه ۱ درست است. گزینه ۲ کمی با جواب متفاوت است. گزینه ۳ کاملاً برعکس است و گزینه ۴ بی‌ربط است.

۸- گزینه ۴ درست است.

معنی گزینه‌ها عبارتند از:

۱- یقینی ۲- ماتریس ۳- زمان ۴- عدم قطعیت

با توجه به عبارت randomly گزینه گزینه ۴ درست است.

۹- گزینه ۲ درست است.

معنی گزینه‌ها عبارتند از:

۱- توضیح دادن ۲- پوش کردن ۳- نمایش دادن ۴- کپی کردن

باتوجه به عملکرد رادار گزینه ۲ درست است.

۱۰- گزینه ۱ درست است.

باتوجه به اینکه جمله دوم نتیجه جمله اول است، گزینه ۱ درست است.

۱۱- گزینه ۳ درست است.

معنی گزینه‌ها عبارتند از:

۱- اضافی ۲- آماری ۳- جانبی ۴- دوطرفه

۱۲- گزینه ۴ درست است.

کلمه مورد نظر به معنی انحراف است.

معنی گزینه‌ها عبارتند از:

۱- شیرجه ۲- مطابقت ۳- کشتن ۴- گمراهی

۱۳- گزینه ۲ درست است.

کلمه مورد نظر به معنی نشی است.

معنی گزینه‌ها عبارتند از:

۱- راه‌اندازی کردن ۲- چکیده ۳- پرتابی ۴- رانشی

۱۴- گزینه ۲ درست است.

hypothesis به معنی فرضیه است.

معنی گزینه‌ها عبارتند از:

۱- تئوری ۲- قانون ۳- واقعیت ۴- پروسه

۱۵- گزینه ۳ درست است.

trickling down to these devices from grand government projects but surging up from this innovation hot spot. Although some manufacturers have gone to great lengths to prevent unusual uses of their consumer equipment, it is hoped that most would adopt Sony's tinkerer-friendly attitude, allowing this hot spot to percolate upward as fast as possible.

3 - By reading the passage, which of the following can best reveal who a tinkerer may be?

- 1) Children playing with Playstations
- 2) Researchers working at scientific centers
- 3) Manufacturers producing consumer electronics
- 4) People who try to repair or improve something in a casual way

► Exercise 4 (EE 83)

Invent Resources, known as IR, is an inventions-on-demand company made of a quartet who got the idea to join forces for invention of new products. IR's trademark is the breadth of knowledge, disciplines and personalities - its four principals bring to the table, comprised of a physicist, an MIT educated engineer, another MIT physicist and medical technology specialist, and a University of London mathematician.

4 - What is meant by a "quartet" in the above passage?

- | | |
|---|--------------------------------------|
| 1) A group of 4 persons | 2) A company comprised of 4 sections |
| 3) A company with 4 major developing phases | 4) All of the above |

► Exercise 5 (CE 83)

Traditional methods of teaching no longer suffice in this technological world. Currently there are more than 1,000,000 computers in schoolrooms in the United States. Students, mediocre and bright alike, from the first grade through high school, not only are not intimidated by computers, but have become avid participants in the computer epoch.

5 - The expression "traditional methods" of teaching in the first sentence refers to...

- 1) technological methods of teaching
- 2) teachers, textbooks, and class drills
- 3) teachers who punish students for not learning
- 4) teaching the students with the aid of computers



When the inference question is difficult to answer, you can find the answer by a **process of elimination**. It means you should remove from several possible answers the ones which were unlikely to be correct until only one is left.

(Exercise 6 (CE 83)

Traditional methods of teaching no longer suffice in this technological world. Currently there are more than 1,000,000 computers in schoolrooms in the United States. Students, mediocre and

EE 87 Azad Answer

قبل از پاسخ‌دهی به سؤالات این بخش، ذکر تفاوت بین سؤالات زبان تخصصی در آزمون ورودی دانشگاه آزاد و سراسری لازم بنظر می‌رسد. در آزمون زبان تخصصی دانشگاه آزاد فرض بر این است که داوطلب با مفاهیم، اصطلاحات و لغات فنی سؤال از قبل آشنایی دارد. اما آزمون زبان تخصصی دانشگاه سراسری با این پیش فرض است که داوطلب هیچ اطلاعات قبلی از سؤالات ندارد و صرفاً باید سؤالات را به کمک اطلاعات داده شده در متن و بکمک روشهای استاندارد درک مطلب پاسخ دهد.

۱- گزینه ۱ درست است.

معنی گزینه‌ها عبارتند از:

۱- بطور مجزا ۲- بطور مناسب ۳- بطور موثر ۴- بطور عمدی

با توجه به مفهوم جمع آثار (superposition) در درس مدار یک، گزینه ۱ درست است.

۲- گزینه ۱ درست است.

معنی گزینه‌ها عبارتند از:

۱- حرارتی ۲- تداخل ۳- هم‌سنوایی ۴- بین‌مدولاسیونی

گزینه ۴ بی‌معنی است. گزینه ۳ بخاطر چند منبع ایجاد می‌شود. گزینه ۲ کلی بوده و به معنی خود نویز است.

۳- گزینه ۲ درست است.

معنی گزینه‌ها عبارتند از:

۱- ایجاد وقفه کردن ۲- جابجا شدن ۳- شکستن ۴- فرو ریختن و از بین رفتن

با توجه به عملکرد circuit breaker در درس رله و حفاظت، گزینه ۲ درست است. گزینه‌های ۳ و ۴ برای انحراف دانشجو هستند.

۴- گزینه ۲ درست است.

معنی گزینه‌ها عبارتند از:

۱- تخمین زدن ۲- پیش‌بینی کردن ۳- تاسیس کردن ۴- واگذاری حق اختراع

با توجه به کلمه واقعیت (fact) مناسبترین گزینه، گزینه ۲ است.

۵- گزینه ۲ درست است.

معنی گزینه‌ها عبارتند از:

۱- عملکرد ۲- پایه و اساس ۳- بررسی ۴- موقعیت

با توجه به فعل قرار داشتن (lies in) گزینه ۲ درست است.

۶- گزینه ۳ درست است.

معنی گزینه‌ها عبارتند از:

۱- قابل دسترس ۲- سازگار ۳- منسوخ ۴- عملیاتی

bright alike, from the first grade through high school, not only are not intimidated by computers, but have become avid participants in the computer epoch.

Kids operating computers implement their curriculum with great versatility. A music student can program musical notes so that the computer will play Beethoven or the Beatles. For a biology class, the computer can produce a picture of the intricate biology in a profound way. A nuclear reactor is no longer an enigma to students who can see its workings in minute detail on a computer. In Wisconsin, the Chippewa Indians are studying their ancient and almost forgotten language with the aid of a computer. More commonly, the computer is used for drilling math and language concepts so that youngsters may learn at their own speed without trying the patience of their human teachers. The simplest computers aid the handicapped, who learn more rapidly from the computer than from humans. Once irksome, remedial drills and exercises now on computer are conducive to learning because the machine responds to correct answers with praise and to incorrect answers with frowns and even an occasional tear.

Adolescents have become so exhilarated by computers that they have developed their own jargon, easily understood by their peers but leaving their disconcerted parents in the dark. They have shown so much fervor for computers that they have formed computer clubs, beguile their leisure hours in computer stores, and even attend computer camps. A Boy Scout can get a computer merit badge. One ingenious young student devised a computer game for Atari that will earn him \$100,000 in royalties.

This is definitely the computer age. It is expected that in 2-3 years there will be between 3,000,000 and 6,500,000 computers in American schools. Manufacturers of computers are presently getting tax write-offs for donating equipment to colleges and universities and are pushing for legislation to obtain further deductions for contributions to elementary and high schools. Furthermore, the price of computers has steadily fallen to the point where a small computer for home or office is being sold for less than \$100. At that price every class in the country will soon have computer kids.

6 - The author of this article implies that

- 1) traditional methods of teaching are obsolete today
- 2) computers are difficult to operate
- 3) students today have to be smarter than their parents
- 4) computers make learning today easier than it was in the past

► Exercise 7 (CE 84)

In the heady, early days of computers, even sober scientists believed that machines would become "intelligent" and eventually start to think like us. That was the promise of artificial intelligence, or AI, in the 1950s, and in the 1960s, and in the 1970s.

گزینه ۴ درست است.

۲۴- گزینه ۴ درست است.

سؤال از نوع تحلیلی است زیرا در صورت سؤال از عبارت implies استفاده شده است. براساس جمله

Aqua can't yet recognize coral or other stationary marine life

می توان حدس زد که مشکل کنونی حل شود.

۲۵- گزینه ۳ درست است.

باتوجه به جمله هدف

Cost overruns and project delays have led to a cloudy forecast for United States' new polar-orbiting weather satellites

گزینه ۳ درست است.

۲۶- گزینه ۱ درست است.

باتوجه به عبارت

the first-ever color pictures to be seen from a satellite in real time.

گزینه ۱ درست است.

۲۷- گزینه ۱ درست است.

در مقایسه آنها آمده است:

Spin is a purely quantum phenomenon roughly akin to the directional behavior of compass needle

بهترین روش برای پاسخ به این سؤال رد گزینه ها است.

۲۸- گزینه ۲ درست است.

گزینه ۱ اگرچه درست است اما نتیجه گیری اصلی محسوب نمی شود. گزینه ۳ کاملاً غلط است. گزینه ۴ بدلیل عبارت are now

made اشتباه است.

۲۹- گزینه ۴ درست است.

سؤال بسیار ساده است. باتوجه به جمله هدف

Metal-to-metal and metal-to-poly capacitors, are linear and have high Q

گزینه ۴ درست است.

۳۰- گزینه ۲ درست است.

باتوجه به جمله هدف

The need for additional masks process steps makes these capacitors more expensive compared to other types of capacitors

گزینه ۴ درست است.

Spectrum, over those decades, believed the gospel of AI evangelists. Among the many articles we ran on the imminence of machine intelligence was one 20 years ago. It prophesied in June 1984 that expert systems - programs that mimic human experts' ability to make decisions - would replace air traffic controllers by the year 2000, and doctors and scientists within as few as 50 years.

The debate on whether machines were really intelligent was a favorite topic in conference halls and journal pages. Spectrum was no exception. "Intelligent systems will begin to make their way into the world, but few people will consider them to be really intelligent after all," wrote Robert Kahn in 1983. Kahn was one of the founders of the Internet and a former research director at the Defense Advanced Research Projects Agency, in Arlington, Va.

But the best assessment of AI turned out to be that of a June 1979 letter by reader Joseph Bates from Cornell University, in Ithaca, N.Y., who wrote: "I believe we are on the road to building artificial intelligence, but considering that we still have a trouble developing correct 10-line programs, it is likely to be a long journey." Bates was right, and the journey continues for AI researchers. As for machines usurping humans, so far computers have made inroads on only a couple of fronts: telephone switchboards and grandmaster chessboards.

7 - By reading the passage what is meant by Spectrum?

- 1) A scientific journal.
- 2) Gospel of AI Evangelists.
- 3) Articles on Machine Intelligence.
- 4) The favorite topic in conference halls and journal pages.

8 - Which of the following sentences best reveals what the passage says?

- 1) Artificial Intelligence has replaced manpower.
- 2) Artificial Intelligence has still a long way to go.
- 3) The early days of computers are over and nowadays machines usurp humans.
- 4) Building of Artificial Intelligence is no exception to the developments that were prophesied earlier.

► Exercise 8 (CE 84)

Movie studios are in the midst of digitizing their archived films so that they can be repackaged for digital distribution. Part of the process involves finding and removing the defects that inevitably come with age, particularly those distracting long, vertical scratch lines. So far, automatic detection of these lines has proved elusive, requiring either lots of manual tuning or many false alarms. But workers at the Istituto per Le Applicazioni del Calcolo, in Rome, now have an improved scheme for automatically detecting these lines, which are usually a mere 3 to 10 pixels wide.

The key insight is that scratches should be modeled in a more complex manner than if they were purely noise-added to the image. In addition to being fast enough to run in real time, the new method keeps the number of false positives low, so there is little fear that it will accidentally remove, for example, the hanging rope in your favorite cowboy movie.

گزینه ۴ درست است. عبارت the spot بجای Moses Lake استفاده شده است.

۱۷- گزینه ۳ درست است.

باتوجه به جمله هدف

six-wheeled lunar truck called Chariot....to carry up to four suited astronauts, Chariot has an active suspension that lets any part of the truck be lifted and lowered independently.

گزینه ۳ درست است. براساس عبارت six-wheeled گزینه های ۱ و ۴ بوضوح غلط هستند.

۱۸- گزینه ۴ درست است.

درباره گزینه ۱ اطلاعاتی در دست نیست. باتوجه به جمله

solid-state drives suffer not from enormous price tags but also from slow performance

گزینه های ۲ و ۳ غلط هستند. باتوجه به جمله هدف

it is a problem when you have to make frequent small additions and changes to existing data

گزینه ۴ درست است.

۱۹- گزینه ۳ درست است.

باتوجه به جمله هدف

They developed a prototype solid-state drive, that employs a small amount of FRAM

گزینه ۳ درست است.

۲۰- گزینه ۲ درست است.

براساس how در صورت سؤال گزینه های ۱ و ۳ کاملاً غلط هستند.

باتوجه به جمله هدف

hydraulic rams, which pump high pressure oil through the turbines

گزینه ۲ درست است.

۲۱- گزینه ۴ درست است.

جمله هدف عبارت است از:

the UK-Scotland in particular-leads in the research and development of ocean energy and is expected to end up with the most installed capacity in the coming years

در نتیجه گزینه های ۲ و ۳ غلط هستند چون در ارتباط با کشور پرتغال هستند. چون جمله هدف درباره تولید انرژی دریایی است و نه

تولید محفظه (canister) بنابراین گزینه ۱ نیز غلط است.

۲۲- گزینه ۴ درست است.

نکته سؤال ارتباط بین جملات متوالی است. علت ساخت در جمله اول متن آمده است در حالیکه Aqua در جمله دوم معرفی شده

است.

۲۳- گزینه ۴ درست است.

باتوجه به عبارت

Unlike many earlier UVs (under water vehicle), Aqua is intended for shallower waters

9 - What does the passage imply as to the method used?

- 1) There is a complex scratch model
- 2) There are lots of manual tuning and false alarms
- 3) They have an improved scheme of mere 3 to 10 pixels wide
- 4) There is a little chance of removing unwanted parts accidentally

(Exercise 9 (CE 84)

XML, the extensible mark-up language, provides structure as well as good looks to a document. While HTML can format things like headlines and tables and is considered as the current language, XML can define things like dates, invoice numbers, and prices and is assumed to be able to replace the HTML in a few years. This means you can build data files, Web pages, or documents that can be probed with simple questions by relying on semantics and logic instead of key words that this in turn speeds up any search you need to make.

To make this kind of smart searching possible, one further concept comes into play: the resource description format (RDF), a way of specifying the relationship between entities. It defines how pieces of data are represented in a series of documents, acting like a dictionary of definitions- For example: is "spectrum" a scientific term defining a range of electromagnetic frequencies, a slice of opinions or viewpoints in sociology or politics, or a well-known magazine? The builder of the database gets to decide, or adopt a definition suggested in some other already defined RDF. This allows you to define an ontology, or the relationships among RDF statements, linking various data elements in documents and allowing logical inferences to be made. An ontology is a "family tree," or a cluster of related concepts; for example, to a medical database, all words ending in -oma are types of cancer.

10 - According to the passage, what is the principal feature of the XML?

- | | |
|-------------------------|--------------------------------|
| 1) Building data files | 2) Formatting the text |
| 3) Relying on semantics | 4) Having the ability to infer |
-

(Exercise 10 (CE 85)

Got sensitive information in your workstation's files at the office? Do you worry when you must step away for a few minutes that someone could snoop around too easily? If so, you might want to safeguard your system with the USB Wireless Security Lock. It works like a car's remote door opener. Walk away from your computer and the machine instantly locks up, making its contents inaccessible to anyone else. When you return, the computer is automatically available.

The secret is in a round transmitter you carry in your pocket. It's powered by a 3-volt battery and has a range of about 2 meters - enough to signal a receiver dongle plugged into the computer's USB port to keep the machine turned on. Walk out of range, and the dongle loses the 315-megahertz signal and locks the computer. This scheme is safer than a password protection system linked to a computer's screen saver, which is usually set to turn on after a few minutes of inactivity. That leaves a window of time during which someone can fiddle with your computer.

If the transmitter is lost or the dongle is removed, a series of user-selected passwords, which only you will know, allows you to regain access to your machine.

EE 88 Answer

- ۱- گزینه ۴ درست است.
معنی گزینه‌ها بترتیب عبارتند از: استخراج کردن- شمردن- استناد کردن- بادقت اشاره کردن
 - ۲- گزینه ۳ درست است.
معنی گزینه‌ها بترتیب عبارتند از: قبلی- همپوشانی- رو به انحطاط گذاشتن، تنزل کردن- محدود کردن
 - ۳- گزینه ۱ درست است.
معنی گزینه‌ها بترتیب عبارتند از: دلیل- شراکت- شرط لازم- تعریف
 - ۴- گزینه ۲ درست است.
معنی گزینه‌ها بترتیب عبارتند از: نسخه- نابهنجاری- شبیه سازی- تناسب
 - ۵- گزینه ۳ درست است.
معنی گزینه‌ها بترتیب عبارتند از: جامع- ۹- زیان بخش- آینده
 - ۶- گزینه ۴ درست است.
معنی گزینه‌ها بترتیب عبارتند از: مرتبط بودن- شکستن (پایان پذیرفتن)- قابل توجه- آغاز کردن
 - ۷- گزینه ۲ درست است.
معنی گزینه‌ها بترتیب عبارتند از: زنده ماندن- تحمل کردن- معلق کردن- تسلیم کردن
 - ۸- گزینه ۲ درست است.
معنی گزینه‌ها بترتیب عبارتند از: ستم گری- مرحله مهمی از زندگی- همدوسی- جهت
 - ۹- گزینه ۳ درست است.
معنی گزینه‌ها بترتیب عبارتند از: رفاه و آسایش- درآمد- مجموعه- کمی
 - ۱۰- گزینه ۱ درست است.
معنی گزینه‌ها بترتیب عبارتند از: نسبت دادنی- متمایل به توسعه- قابل تغییر- تعویضی
 - ۱۱- گزینه ۳ درست است.
 - ۱۲- گزینه ۱ درست است.
 - ۱۳- گزینه ۲ درست است.
 - ۱۴- گزینه ۴ درست است.
 - ۱۵- گزینه ۱ درست است.
 - ۱۶- گزینه ۴ درست است.
- باتوجه به جمله هدف

NASA liked the spot, too, because the loose sand and treeless horizon roughly simulated the lunar surface.

- 11 - Which of the following statements best reveals the idea behind the passage?
- 1) Having a USB Wireless Security Lock can be very efficient in making your computer's content inaccessible to others
 - 2) Having a USB Wireless Security Lock allows you to regain access to your machine in case the transmitter is lost
 - 3) It's better to have a security plug rather than a password to make your computer inaccessible to other users
 - 4) With a remote control you may be able to control access to your computer

► Exercise 11 (EE 83)

Imagine a Hong Kong dentist and precision toolmaker with a lifelong dream of exploring Mars, who then becomes part of a Mars mission. Sounds improbable? Meet Tzu Chuan Ngnow, known as TC Ng. With the help of four colleagues from the Hong Kong Polytechnic University, Ng is now the team leader for the rock corer-grinder and Mole drill used by the Beagle 2 Lander .

Back in 1992, Ng was watching a documentary about the U.S. Space Shuttle on television when he realized the astronauts were having difficulty manipulating tools in space. Attempting a solution to this problem, he envisioned a pair of modified dental forceps in combination with a series of 70 interchangeable components to perform different tasks. In this way he arrived at his Holinser (holder-inserter) forceps concept .

In the course of 10 years, Ng says, he has spent over US\$ 200,000 of his own money to develop the idea. "There was no funding in Hong Kong, not a single penny, because no one saw any applications to local industry," he says. "I tried to interest NASA at first, but they laughed at the concept because it was based on dental forceps".

In 1995, however, the Russian space program ordered four sets of Holinser tools for precision soldering on board Mir. Ng began to develop tools for use by robots as well as people and, along with the Hong Kong Polytechnic team, became involved in planetary sampling research projects for the European Space Agency .

The sampler drill bits and rock corer-grinder of the team's Beagle 2 Mole are the first instruments of their kind ever flown to Mars. The corer-grinder is the size of a cigarette pack, weighs 420 grams, and uses only 2 W. It can grind, drill, and grip samples of rock powder and subsoil and place them in the Gas Analysis Package (GAP) instrument for analysis, notes Ng .

It has been a long road to Mars for Ng, but he says he is satisfied that his team is becoming respected as a leader in microtool engineering. Since his work with the British space mission has become widely known, NASA has invited him to help it build a microtool sampling system for a future planetary mission.

- 12 - If there is a lesson to be learned from the above passage, it's
- 1) to be satisfied with becoming a leader in microtool engineering
 - 2) to never look down on a simple concept
 - 3) Ng as one part of the Mars mission
 - 4) one should always think big

در پاراگراف آخر آمده است

Field Programmable Gate Arrays are hardware computing platforms that can be dynamically reconfigured

بنابراین گزینه ۱ درست است.

۲۷- گزینه ۳ درست است.

باتوجه به جمله هدف در پاراگراف دوم

the consensus of ... is that the power produced is far too low to cause health hazard so long as people are not being held in close proximity to the antennas.

گزینه ۱ درست است.

۲۸- پاسخ صحیح گزینه (۹) می باشد.

جمله هدف بصورت زیر است

Many of these experts believe that cancer is a risk associated with EMR in the higher wattage ranges

گزینه های ۱ و ۴ کاملاً غلط هستند.

اگر منظور طراح سؤال از some در صورت سؤال متضاد many در متن باشد آنگاه اگر در گزینه ۲ not نبود این گزینه درست بود.

در غیراینصورت گزینه ۳ درست است.

۲۹- گزینه ۴ درست است.

باتوجه به جمله هدف زیر در پاراگراف آخر

it is impossible to prove that any product or exposure is absolutely safe in the absence of long-term research.

گزینه ۴ درست است.

۳۰- گزینه ۲ درست است.

باتوجه به جمله هدف زیر در پاراگراف آخر

A notable danger involving the use of cellular phones is not radiation, but is rather the increased risk of driving accidents while using them.

گزینه ۲ درست است.

► Exercise 12 (EE 84)

It has been more than two decades since the personal listening device forever changed family dynamics, by making fights over the car stereo an anachronism. By year's end, Toshiba Corp. hopes to further the cause of domestic harmony by introducing a thumb-sized fuel cell that it says can power an MP3 player for 20 hours on a single ampoule of methanol. A 5.6-centimeter, 8.5-gram prototype, said to be the world's smallest, puts out about 100 mill-watts. Toshiba is working to increase the fuel cell's power output by the end of this year so it can be incorporated in a host of portable electronics, such as laptop computers and handheld videogames.

13 - What is meant by the first two lines of the above passage?

- 1) The members of the family are anarchists who fight for their favorite music
- 2) The members of the family no more fight over their favorite music when they are riding their car
- 3) The members of the family are fighting no more because family dynamics have changed
- 4) The members of the family are incessantly fighting over their favorite music when they are riding their car

(Exercise 13 (EE 84))

The electronic system of the future will monitor itself, change the functions it performs, and repair its damaged circuits - all without external intervention. Such is the dream of autonomic computing. Although the dream is not yet a reality, engineers and scientists have taken a big step forward with the development of an on-chip fuse that is electrically blown - or programmed - by using a physical effect that is usually considered to be a serious reliability problem in semiconductor circuits.

According to the main developer, combining the new eFuse technology with already available on-chip built-in self-test and self-repair circuitry would yield a chip capable of diagnosing its failures and then fixing them by blowing fuses to reroute its circuits. The built-in self-test circuitry determines which parts of the chip do not work properly and sends the information to the self-repair circuitry which figures out what fuses to open in order to replace the failed circuits with spare, redundant ones.

For several generations of semiconductor process technologies, fuses and redundant circuits have worked hand in hand to repair chips and increase the number of usable chips on a wafer. They are particularly important in chips with embedded DRAMs, in which cutting of fuses allows extra rows or columns of memory cells to replace damaged ones. However, the fuses are cut from outside the chip by using laser slicing through metal lines placed on the chip's topmost layer. The drawback is that this process is a lengthy and costly one.

14 - According to the text, the future generation of electronic systems will be ...

- 1) built faster and cheaper
- 2) built faster but at a higher price
- 3) built cheaper but require more time to build
- 4) more expensive to build but have a higher reliability

(Exercise 14 (EE 85))

Electricity's green roots run deep, starting with one of its earliest applications: the incandescent lamp .

باتوجه به به آخرین جمله پاراگراف اول گزینه ۱ درست است زیرا less monopolized and more decentralized متضاد centralized هستند که باتوجه به فعل shift مترادف خواهند بود.

۱۸- گزینه ۴ درست است.

جمله هدف در پاراگراف آخر آمده است. بنابراین گزینه ۴ کاملترین گزینه است.

۱۹- گزینه ۲ درست است.

باتوجه به پاراگراف سوم و جمله هدف

VoIP, communication promises to disrupt the well-established players and business models of telephony.

گزینه ۲ درست است.

۲۰- گزینه ۲ درست است.

سئوال از نوع restatement است. باتوجه به جمله هدف

Intelligence and flexibility are essential in a mechatronic product.

گزینه ۲ درست است.

۲۱- گزینه ۱ درست است.

سئوال از نوع restatement است. باتوجه به جمله هدف

Furthermore, advances in the manufacturing of silicon chips ...have opened the world to the development of microsensors....

گزینه ۱ درست است.

۲۲- گزینه ۲ درست است.

سئوال از نوع restatement است. باتوجه به جمله هدف

this paper focuses on... such as inductive, capacitive, photoelectric, ultrasonic, linear ...

گزینه ۲ درست است.

۲۳- گزینه ۳ درست است.

باتوجه به جمله هدف

SENSEMAKER took its ... which capture sensory data from eyes, ears and touch

گزینه ۳ درست است. بجای eyes, ears and touch عبارت human sense آمده است.

۲۴- گزینه ۱ درست است.

باتوجه به جمله هدف

SENSEMAKER first developed a model of human perception,

گزینه ۱ درست است.

۲۵- گزینه ۴ درست است.

باتوجه به دو جمله اول پاراگراف دوم گزینه ۴ کاملتر است.

۲۶- گزینه ۱ درست است.

The lamp was a welcome advance, and not just for its light. In 1893, architect Frank T. Lent described electric incandescent light as "the acme of all methods of lighting ... never impairing the air in it a room." Electric light was a clean, safe alternative to the gas that was being used to light businesses and homes. Gas was sooty, consumed oxygen, and released carbonic acid into the air, damaging books, curtains, and carpets.

"Smoke, ashes, and cinders are unknown because electricity is used now for which formerly fires had to be built," novelist Solomon Schindler wrote in 1894. That was not entirely true; coal-fired stations still generated most of the electricity. Although generating power centrally back then does not qualify as green by today's standards, it was less harmful to the environment than the scores of dispersed coal burning furnaces would have been. In the 19th century, factories were clustered in cities, instead - as nowadays outside of them, so clean power sources were a civic necessity. Steam replaced water power as the primary source of energy used by industries in the United States and Europe, and that resulted in grimy, smoke shrouded cities.

15 _ It can be deduced from the text that...

- 1) grimy and smoke-shrouded cities are unknown to well-developed countries
- 2) nowadays smoke, ashes and cinders are unknown because electricity has replaced them
- 3) electricity generation was not necessarily Green given the fact that it is generated by coal-fired stations
- 4) a century ago factories were dispersed out of the cities but nowadays they are in central urban Areas

► Exercise 15 (EE 86)

Central to an autonomous entity are the rules of behavior governing how it must act or react to the information collected by the detector from the environment and its neighbors. These rules determine into what state the entity should change and also what local knowledge should be released via the effector to the environment.

In order to adapt itself to a problem without being explicitly told what to do in advance, an autonomous entity must modify the rules of its behavior over time. This ability, responding to local changing conditions, is known as the individual's learning capability. Worth noting is that randomness plays a part in the decision making process of an autonomous entity despite the presence of a rule set. It allows an autonomous entity to explore uncharted territory despite evidence that it should exploit only a certain path. On the other hand, randomness helps the entity resolve conflict in the presence of equal support for suggestions to act in different ways in its own best interests and avoid being stuck by randomly choosing an action in local optima.

The environment acts as the domain in which autonomous entities are free to roam. This is a static view of the environment. The environment of a NIC (Nature-Inspired Computing) system can also act as the "noticeboard" where the autonomous entities post and read local information. In this dynamic view, the environment is constantly changing.

16 _ If the individual's learning capacity is not high enough, an autonomous entity ...

- | | |
|---------------------------------------|---|
| 1) cannot adapt itself to a problem | 2) can respond to local changes |
| 3) modifies the rules of its behavior | 4) should be told what to do in advance |

EE 87 Answer

- ۱- گزینه ۱ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: بازرسی- شبیه‌سازی- اسناد- قانون اساسی
- ۲- گزینه ۴ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: درنهایت- ذاتی- پتانسیل- اجتناب ناپذیر
- ۳- گزینه ۳ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: متغیرها- دلالت- محدودیتها- روندها
- ۴- گزینه ۲ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: بنا شده- تحریک شده- تخصیص داده شده- نادیده گرفته شده
- ۵- گزینه ۲ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: آزاد کردن- تغییر دادن- کم شدن- فعل و انفعال
- ۶- گزینه ۴ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: تجربی- پایدار- متوالی- وسیع
- باتوجه به کلمه great در صورت سؤال، گزینه ۴ مناسبترین است.
- ۷- گزینه ۲ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: مصمم- رد کردن- درک کردن- مواجه شدن
- ۸- گزینه ۳ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: همدوس- تمایز- میل- مکمل
- ۹- گزینه ۳ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: تبدیل شدن- باقی ماندن- تغییر کردن- توزیع شدن
- ۱۰- گزینه ۱ درست است.
- معنی گزینه‌ها بترتیب عبارتند از: اولویت- کاربرد- انگیزه- تنظیم
- ۱۱- گزینه ۱ درست است.
- ۱۲- گزینه ۱ درست است.
- ۱۳- گزینه ۳ درست است.
- ۱۴- گزینه ۳ درست است.
- ۱۵- گزینه ۴ درست است.
- ۱۶- گزینه ۳ درست است.
- درباره MEMS در پاراگراف دوم آمده است. باتوجه به صفت miniature گزینه ۳ درست است. گزینه‌های ۱ و ۲ درباره The components یا بعبارت دیگر generate power, process waste, and purify water هستند.
- ۱۷- گزینه ۱ درست است.

Lesson 6

Point of View

Point of view is one of the first choices writers make when they begin to write, because it is the point of view that determines the way of speaking to the reader. Point of view is the perspective through which the writer channels his or her information and ideas. Just as we may look at a physical object from a number of different perspectives (from above it, below it, behind it, beside it, and so on), we can look at information and ideas from different perspectives as well.

The writer never expresses his or her point of view directly. It is implied and you should find it according to the contextual clues such as examples, sentence connectors, tone of the passage, tense of verbs, and so on. In the other words, finding the author's point of view is an inherently inference question. The author's point of view can be *totally negative*, *mostly negative*, *conditional*, *mostly positive*, or *totally positive*.



If all the sentences in the passage convey a *negative* or *positive* view related to the main idea, the author's point of view is *totally negative* or *totally positive* respectively.



If some of the sentences in the passage convey a *negative* view and others convey a *positive* view related to the main idea, the author's point of view can be *mostly negative*, *mostly positive* or *conditional*. The last sentence as the conclusion sentence determines the author's point of view.

If the conclusion sentence be *negative*, the author's point of view is *mostly negative*. If the conclusion sentence be *positive*, the author's point of view is *mostly positive*.

If the conclusion sentence be *conditional* (positive and negative), the author's point of view is *conditional*.

► Exercise 1 (CE 83)

Electronic technology has produced significant changes in the way that humans interact. Before telephones, computers, and digital pagers, people communicated primarily by writing. We had to sit down,

این سؤال درباره جراحی روی انسان است که طبق پاراگراف سوم، در سال ۲۰۰۱ در فرانسه انجام شده است.
۲۰- گزینه ۳ درست است.

سؤال از نوع restatement است که جمله در پاراگراف target آن was a modified version of a system originally developed می‌باشد. بنابراین گزینه (۳) صحیح است.

۲۱- گزینه ۱ درست است.

با توجه به عبارت chose an unusual place در پاراگراف اول که منظور ۱۹ متر زیر دریا است، گزینه ۱ درست است.
۲۲- گزینه ۲ درست است.

سؤال از نوع restatement و بسیار ساده است. با توجه به جمله... gallbladder removal... در پاراگراف سوم براحتی می‌توان
گزینه (۲) را انتخاب کرد.
۲۳- گزینه ۴ درست است.

چون در این سؤال گزینه‌ها مربوط به بخشهای مختلفی هستند و متن نیز طولانی است، این سؤال زمانبر خواهد بود.
گزینه ۱ براساس عبارت Customers may no longer belong to only one operator, در پاراگراف اول غلط است. گزینه ۲
باتوجه به When there is a video message addressed to the mobile user, no matter where the user is located در
پاراگراف دوم غلط است. در گزینه ۳ عبارت all the time غلط است.

گزینه ۴ باتوجه به عبارت These agents act as intermediaries between the user and the Internet درست است.
۲۴- گزینه ۲ درست است.

این سؤال نیز مجدداً وقتگیر است. گزینه ۱ باتوجه به عبارت

4G networks ... with possibly different charging units

در پاراگراف اول نادرست است. گزینه ۳ نیز براساس جمله زیر غلط است.

This adds difficulty to the task of designing a good charging scheme for all customers

باتوجه به عبارت زیر گزینه ۲ درست است.

It is very complicated to decide a good tariff for all the possible components

۲۵- گزینه ۳ درست است.

باید در متن به دنبال عبارت personal mobility گشت. باتوجه به اولین جمله از پاراگراف دوم یعنی

personal mobility is a concern in mobility management.

بوضوح گزینه ۳ درست است.

compose our thoughts, and then spend some time writing them down on paper. There was also a delay between the expression of our ideas and their reception on the other end, but folks were patient enough to wait. With technology, however, communication happens in "real time". We don't take time before had to consider what we want to say, and how to say it best. We express ourselves directly, and bluntly. Now we are irritated when no one answers the phone, or get overly anxious if we don't receive an immediate response to an email or page. We want all of our communication to happen instantaneously.

1 - The author of this passage probably believes that the effects of technology on human communication are....

- | | |
|-----------------------|------------------------|
| 1) mostly negative | 2) almost negligible |
| 3) not very important | 4) not well understood |

(Exercise 2 (CE 80)

While reading about the future of the wireless telephone, I recalled some controversy over this system. There is no doubt that wireless telephone benefit our society. The industry's approach to installing antennas wherever it wishes, however, over the objections of local communities, does not benefit our society.

For example, regardless of the design, antennas are unsightly intrusion into local parks and playgrounds. When they are installed there over the objections of the community, the system degrades our society. Moreover, it reflects poorly on engineers and the technology they bring to our benefit. The industry needs to approach the planning and installation of antennas with greater senility and creativity than it has shown to date.

2 - Which of the following best explains the author's view on wireless?

- | | |
|---------------------------------------|---|
| 1) it benefits our society | 2) expanding wireless should be coordinated |
| 3) it intrudes into local environment | 4) it does not benefit the local community |

► **Exercise 3 (CE 84)**

But the best assessment of AI turned out to be that of a June 1979 letter by reader Joseph Bates from Cornell University, in Ithaca, N.Y., who wrote: "I believe we are on the road to building artificial intelligence, but considering that we still have a trouble developing correct 10-line programs, it is likely to be a long journey." Bates was right, and the journey continues for AI researchers. As for machines usurping humans, so far computers have made inroads on only a couple of fronts: telephone switchboards and grandmaster chessboards.

3 - When Joseph Bates of Cornell University comments on the assessment of AI what is his tone?

- | | | | |
|-----------|--------------|---------------|---------------|
| 1) Ironic | 2) Realistic | 3) Idealistic | 4) Scientific |
|-----------|--------------|---------------|---------------|

► **Exercise 4 (CE 86)**

۱۰- گزینه ۴ درست است.

براساس پاراگراف آخر متن، گزینه ۴ کاملترین است.

۱۱- گزینه ۲ درست است.

باتوجه به جمله هدف زیر بوضوح گزینه ۲ درست است.

At very high altitudes the atmosphere is very thin, and as a result the levels of ionization are very low.

۱۲- گزینه ۳ درست است.

باتوجه به جمله هدف در پاراگراف اول بسادگی گزینه ۳ درست است.

It is also found that for the higher layers including the F and E layers most of the ionization results from ultra violet light.

۱۳- گزینه ۲ درست است.

نکته سؤال ضمیر it است که در جمله

it remains over night,..it takes longer for the recombination process to take place

اشاره به F layer دارد.

۱۴- گزینه ۱ درست است.

بهترین روش پاسخدهی به این سؤال یافتن جمله هدف و توقف در خواندن است. گزینه ۱ بوضوح در پاراگراف اول آمده است و چون سایر گزینه‌ها تکمیل شده این گزینه نیستند، براحتی می‌توان این گزینه را انتخاب نمود.

۱۵- گزینه ۳ درست است.

باتوجه به عبارت encryption is not allowed در پاراگراف دوم گزینه ۳ درست است. گزینه ۱ کاملاً برعکس است. گزینه‌های ۲ و

۴ باری با کلمات هستند.

۱۶- گزینه ۱ درست است.

براساس جمله (FCC) the authority to regulate use of the radio spectrum falls to the در پاراگراف دوم گزینه ۱ درست

است. کلمه power در صورت سؤال مترادف authority در جمله هدف است. گزینه ۴ درست است اما کلمل نیست زیرا نوع

محدودیت را بیان نکرده است.

۱۷- گزینه ۲ درست است.

باتوجه به کلمه reveal می‌توان فهمید که سؤال از نوع استدلالی است. از جمله

There is no such obstacle to controlling low-power radio, however.

می‌توان به نادرستی گزینه‌های ۱ و ۳ پی برد. زیرا بخش اول گزینه ۱ کاملاً غلط بوده و بخش دوم گزینه ۳ نیز بازی با کلمات است.

۱۸- گزینه ۲ درست است.

قبل از پاسخ دهی به سؤالات این متن توجه کنید در اینجا دو آزمایش انجام شده است. یکی جراحی بر روی مدل غیر انسانی

(experimental surgery) و دیگری جراحی بر روی انسان. دانشجو باید پس از تمایز این دو به سؤالات پاسخ دهد.

این سؤال درباره experimental surgery است که دکتر انوری آن را انجام داده است. بنابراین گزینه ۲ درست است.

۱۹- گزینه ۱ درست است.

It isn't just the technology that has changed. Digitization has altered the way we think about photography and photographs. Digital pictures have become malleable throwaways that we relentlessly save. My mother kept an old shoe box holding pictures from long ago. It was full of faded, sepia-toned, quite formal poses of solemn-faced people in stiff collars and long dresses. I don't know who the people were, and by the time I found the shoe box, sadly, there was no longer any way to find out. There were no captions - no tags or metadata, as we would say. Yet in some way, those curled and faded pieces of cardboard were more real than the thousands of vibrant displays of my own informal digital pictures that appear on my computer monitor today .

The trouble with digital photography begins with the mind-set that it's free, prompting us to take a multitude of thoughtless pictures. Then, because it's also free to save all the pictures, we fill up our disk drives with them, and the few good pictures that should be left to posterity are lost in a glut of trivia. Moreover, there are too many pictures to add captions or descriptions. Instead of a shoe box, I'm leaving a vast refuse pile where posterity will be reluctant to tread.

4. What is the mood of the author in writing the above passage about photography in the past and photography nowadays?

1) Vibrant

2) Realistic

3) Nostalgic

4) Thoughtful



Another concept related to the author's point of view is **figurative language**. Figurative language is a way that the writer uses to convey his/her meaning indirectly. Like proverbs, a set of words, phrases or even sentences which are not meant to be interpreted word by word is regarded as figurative language.



If you come across a figurative language in the given passage, probably you will have one question based on it.



Since the figurative language should not be interpreted word by word, any choice which is directly extracted from it can not be the right answer.

► Exercise 5 (EE 79)

The crowd jumped to its feet and applause thundered as Arthur Kalman stepped away from the podium, concluding the first live demonstration of the technology called digital video interactive. Sarnoff researchers, Larry Ryan and Arch C. Luther, sat on the stage, benumbed. "I wasn't expecting the overwhelming emotional reaction" Rayan said. "I could hardly believe it was happening". Even at the last second, it almost didn't happen.

EE 86 Answer

۱- گزینه ۴ درست است.

جمله هدف مربوط به دو جمله اول پاراگراف دوم است. به ضمیر *this ability* که دو جمله را بهم پیوند می دهد نیز توجه کنید. جمله هدف دقیقاً برعکس گزینه ۴ است که چون صورت سؤال نیز منفی شده متن است گزینه درست گزینه ۴ خواهد بود.

۲- گزینه ۳ درست است.

نکته سؤال ضمیر *it* است که دو جمله زیر را بهم ربط می دهد.

Worth noting is that randomness plays a part in the decision making process.... It allows an autonomous entity to explore uncharted territory ..

۳- گزینه ۱ درست است.

جمله هدف در پاراگراف آخر است که کلمه *necessary* بجای *needed* استفاده شده است.

Analytical and graphical descriptions for modeling physical dynamic systems are necessary for such integration.

در گزینه ۲ عبارت *disintegration* اشتباه است. در گزینه ۴ *analog* غلط است.

۴- گزینه ۲ درست است.

سؤال از نوع *restatement* است که جمله هدف آن در زیر آمده است. بنابراین گزینه ۲ بوضوح درست است.

The integration of design and control becomes even more relevant in the systems approach.

۵- گزینه ۴ درست است.

گزینه ۲ درباره *Si* بوده و جواب نخواهد بود. در بین سایر گزینه ها، گزینه ۴ کاملترین است.

۶- گزینه ۲ درست است.

نکته سؤال درک درست صورت سؤال است. در سؤال پرسیده شده که MEMS های ساخته شده روی چه قرار دارند؟ که طبق جمله هدف در پاراگراف دوم، گزینه ۲ درست است.

They are already used for tasks ranging from in-dwelling blood pressure monitoring to active suspension systems for automobiles.

اگر صورت سؤال بصورت *Where MEMS are manufactured on* بود آنگاه جواب گزینه ۳ می شد.

۷- گزینه ۴ درست است.

براساس جمله اول از پاراگراف آخر یعنی

MEMS are ... through microfabrication technology.

گزینه ۴ درست است.

۸- گزینه ۳ درست است.

طبق جمله هدف زیر گزینه ۳ کاملتر است.

Other 3D systems that have been trailed have proved unworkable because of the time it takes to construct a picture and an inaccurate result.

۹- گزینه ۱ درست است.

نکته سؤال ضمیر *which* است که در عبارت *from which 3D data is generated* به *2D image* اشاره دارد.

5 - "I could hardly believe it was happening" means...

- | | |
|--|--|
| 1) I did not expect what took place | 2) I was not able to grasp it easily |
| 3) It took me some effort to convince me | 4) what happened was difficult to comprehend |

► **Exercise 6 (EE 81)**

Engineering organizations must develop a philosophical foundation for all the relates to the testing of their products and systems. Intrinsic to this philosophy should be the maxim that effective testing is a value-adding process, not a cost. This does not mean that there will always be one right way to test while other ways are wrong. There will always be scope for differences of judgment, or even disagreement, over what and how to test. The element of uncertainty or chance looms large in engineering. Good luck is rare: varying degrees of bad luck are the norm.

6 - What is meant by the statement "the element of uncertainty or chance looms large in engineering"?

Uncertainty or chance....

- | | |
|-------------------------------|---------------------------------|
| 1) exist in engineering | 2) is defying engineering |
| 3) is threatening engineering | 4) is inevitable in engineering |

► **Exercise 7 (EE 81)**

With thousands of functions and a manual large enough to be dangerous if it falls off a desk, Mathematica is a powerful math tool with steep learning-curve, well-suited for math gurus but likely to be overwhelming for ordinary mortals.

7 - How do you think the Mathematica manual is?

- | | |
|-----------------------------|--------------------------------|
| 1) very thick and heavy | 2) a powerful math tool |
| 3) very large and dangerous | 4) with thousands of functions |

► **Exercise 8 (CE 79)**

There are two kinds of numbers, prime and composite, and mathematicians have been trying to tell them apart since the time of Euclid, 2200 years ago. It is easy enough with small numbers: 21 is clearly composite, because it can be divided by 7 and 3; 23 is prime, because it is not dividable by any smaller number except 1, but how can an investigator know if a 15-digit number is prime? A procedure has been developed using a computer that can determine in at most a few hours whether a 100-digit number is prime. One expert has estimated that such a feat previously would have required a century of computer time. The technique initially picks key numbers that have the potential to divide evenly into the large number. With these key numbers, tests are made to detect crucial characteristics of large number and soon the computer produces a short list of the only key numbers that might divide evenly into the large number. The computer then tries to divide the large number by each key number on the list. If none the key numbers works, then the large number must be prime.

8 - The phrase "trying to tell them apart" means...

- 1) attempting to explain the system to non-mathematicians

طبق جمله هدف زیر

Factors associated with the scaling of CMOS technology such as reliability and density are driving down supply voltages.

گزینه ۴ کاملترین گزینه است.

۲۲- گزینه ۲ درست است.

نکته این سؤال ارتباط بین جملات متوالی است. در جمله CMOS

ضمیر this به Threshold voltage اشاره دارد.

۲۳- گزینه ۴ درست است.

باتوجه به جمله

Threshold voltages of future standard CMOS technologies may not decrease much below what is available today

گزینه ۴ درست است.

۲۴- گزینه ۳ درست است.

طبق جمله هدف یعنی

Probably the most important solution to the threshold voltage limitation is the bulk-driven MOSFET.

گزینه ۳ درست است که شامل توضیح bulk-driven MOSFET است.

۲۵- گزینه ۲ درست است.

طبق آخرین جمله متن گزینه ۲ درست است.

- 2) seeking a more convenient way to classify numbers
- 3) endeavoring to differentiate between the kinds of numbers
- 4) looking for ways to end the separation between mathematicians and computer scientists

(Exercise 9 (CE 81))

In dueling press releases, Intel and IBM both laid claim this summer to having built the world's fastest silicon-based transistor. The two companies' accomplishments involved distinct technologies, each of which breaks new ground, expert explained but for very different reasons.

Intel's innovation will enable it to pack faster and smaller transistors into its microprocessors, IBM's feat will allow companies designing faster communications equipment to keep silicon-based chips instead of switching to more expensive, less familiar technologies. Intel's new research device is faster, but IBM's much closer to commercialization. "It's like comparing a new breed of apples with a new breed of oranges" said Dan Hutcheson, president of VLSI research firm located in San Jose, Calif. "one is redder, one is oranger. They are both sweeter."

- 9 - When Dan Hutcheson says: "It's like comparing a new breed of apples with a new breed of oranges", what does he really mean by this? Both....
- 1) have manufactured equipments that are useful for their purposes
 - 2) have manufactured equipments that serve different means
 - 3) have manufactured equipments whose origin is the same
 - 4) are from the same breed, fruits

► **Exercise 10 (CE 82)**

IBM is beginning a large-scale autonomic-computing initiative designed to develop computer system that run with little or no human involvement. IBM is already working on several autonomic-computing projects, some involving artificial intelligence; adaptive algorithms; and self-healing technology, which lets systems keep running even if certain components fail.

Far too much, computer systems work has involved making things faster, larger etc without considering reliability, maintainability, availability, etc. autonomic computing would eventually reduce system support costs and would be most useful in remote areas where human oversight isn't practical, such as in space. In fact, autonomic systems are years away, although in the nearer term, autonomic functionality will appear in servers and software.

- 10 - What is meant by the last sentence of the passage where it says "in fact autonomic systems are....."
- | | |
|-------------------------------------|---|
| 1) for the future | 2) nearer in functionality |
| 3) in reach of servers and software | 4) operating in the computer technology |

پاسخ سؤال اول market and financial risk است. پاسخ دومی gone are the days است. جواب سؤال سوم yes می باشد. سؤال چهارم بخاطر only غلط است.

۱۱- گزینه ۳ درست است.

سؤال استاندارد است و طبق جمله آخر متن بوضوح گزینه ۳ درست است.

۱۲- گزینه ۴ درست است.

طبق خطوط اولیه پاراگراف اول گزینه ۴ کاملترین است.

۱۳- گزینه ۴ درست است.

سؤال از نوع restatement است. گزینه های ۱ و ۲ بی ربط هستند. طبق جمله هدف در پاراگراف اول یعنی

has developed a method for combining the interactivity of computer graphics with the data richness of the hologram

گزینه ۴ که از دو بخش تکیل شده است درست است.

۱۴- گزینه ۲ درست است.

نکته سؤال متمم است. براساس عبارت The second light wave, the reference wave, گزینه ۲ درست است.

۱۵- گزینه ۴ درست است.

سؤال از نوع restatement است. با توجه به عبارات انتهایی پاراگراف دوم گزینه ۴ درست است.

۱۶- گزینه ۲ درست است.

سؤال از نوع restatement است. طبق جمله هدف یعنی

Most current commercial packages for harmonic analysis use a direct solution method...

گزینه ۲ درست است.

۱۷- گزینه ۱ درست است.

سؤال از نوع restatement است که جمله هدف آن جمله زیر است.

This approach provides realistic frequency domain models of the linear ac system.

۱۸- گزینه ۴ درست است.

براساس ترکیب not only...but also در جمله هدف گزینه ۴ کاملتر است.

The overall solution for twelve pulse converter test system depends not only ...but...

۱۹- گزینه ۴ درست است.

سؤال از نوع restatement است. در جمله

Iterative techniques are thus necessary to solve all these variables

ضمیر these variables به اسامی جمله قبلی که در صورت سؤال هستند اشاره دارد.

۲۰- گزینه ۲ درست است.

سؤال از نوع restatement است. طبق جمله هدف که آخرین جمله متن است گزینه ۲ درست است.

۲۱- گزینه ۴ درست است.

Lesson 7

Standard Questions

Standard questions can be regarded as intrinsic inference questions. It means, their answer never stated directly in the passage. However, unlike inference questions there is a systematic way to find their answer. This type of question usually has predefined format and its answer typically located in the fixed and logical locations in the passage.

So, it is necessary to first review the standard format of paragraph and essay in English language. Then, different types of standard questions and their corresponding answering way will be presented.

(Paragraph's Format:

A paragraph consists of a group of sentences related to each other, communicating one central idea. The first line of a paragraph is usually indented and starts with a capital letter.

A paragraph usually begins with a topic sentence, a sentence containing the main idea. The topic sentence tells the reader what the paragraph is about and limits the information to be included in the paragraph. Although the topic sentence is usually the first sentence of the paragraph, sometimes more experienced writers may put it in the middle or even at the end of a paragraph.

The topic sentence is followed by supporting sentences which are related to the topic sentence and give you more information about it. The supporting sentences can also be expanded with additional details.

A paragraph usually terminated with a sentence which is called conclusion sentence. It usually summarizes or comments on the main idea introduced in the topic sentence.

A paragraph also contains transitions. These are words such as "first", "in addition", "in contrast", "for example". Transitions are needed to hold a paragraph together and make it read smoothly. Different transitions are used for different purposes and a short review of them is given here.

EE 85 Answer

- ۱- گزینه ۴ درست است.
- سؤال از نوع تحلیلی است. کلمه Green به معنی بدون آلودگی است. گزینه ۴ همان صورت سؤال است که در متن بوضوح آمده است. گزینه‌های ۲ و ۳ درباره گاز هستند. بنابراین می‌توان به درست بودن گزینه ۴ پی برد.
- ۲- گزینه ۳ درست است.
- با توجه به عبارت deduce (استنباط کردن) سؤال از نوع تحلیلی است. با توجه به عبارت That was not entirely true در پاراگراف دوم که به بدون آلودگی بودن الکتریسته اشاره دارد می‌توان گزینه ۳ را انتخاب کرد.
- ۳- گزینه ۴ درست است.
- درباره این ترانزیستور آمده است:
- ability to operate at microwave frequencies, low noise, high levels of performance
- گزینه ۳ از نظر گرامری غلط است. اگر بتوان performance را بجای power در نظر گرفت، گزینه ۴ کاملترین است.
- ۴- گزینه ۲ درست است.
- طبق جمله هدف در پاراگراف دوم Gallium arsenide is generally used because it provides a high level of electron mobility، گزینه ۲ درست است. در گزینه ۴ کلمه Si غلط است.
- ۵- گزینه ۲ درست است.
- جایگزین ارزانتر fixed frequency source است. گزینه‌های ۳ و ۴ کاملاً غلط است. در بین گزینه‌های ۱ و ۲، گزینه ۲ مناسبتر است.
- ۶- گزینه ۲ درست است.
- باتوجه به جمله هدف
- phono-sockets ... which terminate in phono-plugs
- گزینه ۳ بوضوح درست است.
- ۷- گزینه ۱ درست است.
- گزینه ۲ در ارتباط با complexity، گزینه ۳ با توجه به standardization و گزینه ۴ براساس modify هستند.
- ۸- گزینه ۱ درست است.
- باتوجه به عبارت conclusions در صورت سؤال، سؤال از نوع استاندارد است. بنابراین باید به عبارتهای انتهایی توجه کرد. طبق جمله
- resulted in stagnation rather than innovation and improvement گزینه ۱ درست است.
- ۹- گزینه ۱ درست است.
- سؤال از نوع تحلیلی است. بر اساس جمله
- MASSPOWER was one of the first projects ... of development capital put at risk
- گزینه ۱ درست است. درباره گزینه ۲ اطلاعاتی در متن نیست. طبق متن این پروژه ریسک پذیر بوده و گزینه ۳ نیز غلط است. گزینه ۴ کاملاً برعکس است.
- ۱۰- گزینه ۴ درست است.

(Consider the following paragraph.

Water pollution has endangered animal life in the seas. Many of the fish in the seas are dying and in some areas the fish that are caught cannot be eaten. Sea birds are dying because of oil spills in the sea. Water pollution affects many aspects of human life. Therefore, it is necessary to pay attention to water pollution.

► *Example:* Can you determine the basic elements of this paragraph?

- 1) Topic: water pollution
- 2) Topic sentence: water pollution has endangered animal life in the seas.
- 3) Supporting sentence A: many of the fish in the seas are dying and in some areas the fish that are caught cannot be eaten.
- 4) Supporting sentence B: sea birds are dying because of oil spills in the sea.
- 5) Conclusion sentence: it is necessary to pay attention to water pollution



Topic sentence should state the main idea of what you want to write about. It should include topic and **controlling idea**, which gives more information about the topic.

► *Example:*

Topic sentence: water pollution has endangered animal life in the seas.

Topic: water pollution

Controlling idea: has endangered animal life in the seas

► *Example:*

Topic sentence: watching television is informative.

Topic: watching television

Controlling idea: is informative



Some of the **transitions** and their applications are as follows:

- **Both/both and:** when two things or people have something in common we use both.

► *Example:* both chocolate and ice cream have a lot of calories.

- **Likewise/similarly:** when two sentences or paragraphs show similarity we use “likewise” or “similarly” to introduce the second one.

- 16 - Because a computer works according to the instructions given to it an cannot exercise any value judgments, it has no.....
- 1) originality.
 - 2) velocity.
 - 3) permeability.
 - 4) resistivity.
- 17 - The goal of research is machines witch can.....their own methods of solving problems instead of needing detailed programming.
- 1) compensate.
 - 2) devise.
 - 3) impede.
 - 4) reciprocate.
- 18 - For parallel plate capacitors we usually neglect the.....field at the edges of the plates.
- 1) polarization.
 - 2) charging.
 - 3) applied.
 - 4) fringing.
- 19 - The light sensitive cells in the eye respond to the.....light spectrum extending from about 4×10^{14} Hz to 8×10^{14} Hz.
- 1) visual.
 - 2) visible.
 - 3) optical.
 - 4) luminous.
- 20 - Since the overhead transmission lines span large distances, they are.....to externally induced voltages.
- 1) suspended.
 - 2) distorted.
 - 3) susceptible.
 - 4) distributed.

► *Example:* We often associate eating fast foods like pop-corn with the movies. Likewise, we associate hot-doges with watching ball games.

- **The comparative as...as:** when we compare two things or people that are the same we use as...as.

► *Example:* Some people argue that they can find places in big cities that can be as quite as the country.

- **But:** when two things are different or in contrast we use but.

► *Example:* Fast foods are tasty, but they are fattening.

- **However:** when two sentences or paragraphs are in contrast they can be connected with however.

► *Example:* Fast foods are attractive. However, they are not nourishing.

- **Neither/ neither nor:** when two things or people have something in common “both” is used. When “not” is the common factor between two things or people, “neither” is used.

► *Example:* Neither apple nor orange is not fattening.

- **Either or:** when we want to choose only one of the two things or people we use “either or”.

► *Example:* You can choose either the black shoe or the white shoe.

- **Not only...but also:** when we want to choose two things or people we use “not only...but also”.

► *Example:* Alice is not only clever but generous.

- **In contrast/ on the other hand:** when two things are contrasted in different sentences or paragraphs we can use these transitions.

► *Example:* city life is noisy and fast-paced. In contrast, country life is quite and slow.

► *Example:* fast foods are very convenient. Home-made food, on the other hand, takes a long time to prepare.

- **In spite of/ despite:** when we want to show contrast we can use “in spite of/despite” + noun phrase in a sentence.

► *Example:* Despite high crime rate, many people like to live in big cites.

- 8 - The transmission circuits can themselves fail randomly, by there creating another dimension of..... in the analysis.
- 1) deterministic.
 - 2) matrix.
 - 3) time.
 - 4) uncertainty.
- 9 - Radar denotes a method of.....the surrounding space by means of high-frequency waves.
- 1) illustrating.
 - 2) scanning.
 - 3) displaying.
 - 4) duplicating.
- 10 - If the earth gravitational attraction on two bodies is the same, their "masses" must be the same, hence it follows that the simplest way of measuring the mass of any body is by weighing it. *Hence it follows* can be replaced by.....
- 1) we can deduce from that.
 - 2) we can follow the same principles.
 - 3) when it is reduced.
 - 4) where it follows the simplest way.
- 11 - Machines that are used in connection with the computer are called.....devices.
- 1) additional.
 - 2) statistical.
 - 3) peripheral.
 - 4) bilateral.
- 12 - "Deviation" means.....
- 1) diving.
 - 2) conformity.
 - 3) killing.
 - 4) aberration.
- 13 - "leaking" means.....
- 1) driving.
 - 2) dripping.
 - 3) dropping.
 - 4) drifting.
- 14 - An adequately tested hypothesis is called.....
- 1) theory.
 - 2) law.
 - 3) fact.
 - 4) process.
- 15 - A microphone.....the acoustical energy in an input sound wave into the electrical energy of an output current.
- 1) rectifies.
 - 2) normalizes.
 - 3) converts.
 - 4) reverses.

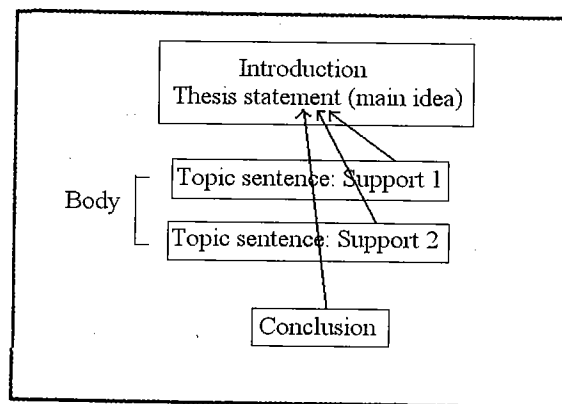
► Essay's Format:

An essay consists of several paragraphs. Similar to a paragraph which includes topic sentence, supporting sentences and conclusion sentence, an essay is also have three main parts: an introductory paragraph, body paragraphs, and concluding paragraph.

The *introductory paragraph* introduces the topic and tells the reader what will follow in the body paragraph(s). It is made up of the *thesis statement*, or main idea, which has the same function in the essay as the topic sentence in a paragraph. Thesis statement usually located at the end of introductory paragraph.

The *body paragraph(s)* support and are related to thesis statement in the introductory paragraph. The number of paragraphs in the body depends on the number of ideas or points you want to discuss.

The *concluding paragraph* comes at the end of essay. It restates your thesis statement in the introduction and summarizes the main points made the body. In fact, the conclusion paragraph acts as a reminder to the reader and is also the place to add some personal views or comment on the main idea.



In order to hold paragraphs of an essay together each paragraph should have a relationship with its two neighboring paragraphs. In the other words, as each paragraph supports the thesis statement, beginning of each paragraph should be related to the end of its previous paragraph. Similarly, end of this paragraph should be associated with the beginning of the subsequent paragraph. We call this relationship the **chain rule**.

► Exercise 1 (EE 83)

According to the FCC, ultrawideband (UWB) is any signal that occupies at least 500 MHz of bandwidth in the 7.5 GHz chunk of spectrum between 3.1 GHz and 10.6 GHz. That definition also includes some rather strict limits on radiated power and power density: it's a lot less than the 3 mW allowed for a cell phone.

As originally developed by several start-up companies that borrowed the technology from U.S. military research, like Xtreme Spectrum Inc. (Vienna, Va.) and Discrete Time Communications (now Staccato Communications Inc., San Diego, Calif.), UWB involves transmitting low-power streams of extremely short pulses - on the order of 10-1000 picoseconds.

PART C

EE AZAD 87

- 1 _By superposition, the current in any element of a circuit is the sum of currents caused by each source.....
with other sources properly removed.
 - 1) individually.
 - 2) appropriately.
 - 3) effectively.
 - 4) deliberately.
- 2 _The ionization of the gas in a flouresent lamp can cause....noise in a radio receiver.
 - 1) thermal.
 - 2) interference.
 - 3) crosstalk.
 - 4) intermodulation.
- 3 _A circuit breaker is a device that automatically.....when abnormal load conditions exist.
 - 1) interrupts.
 - 2) trips.
 - 3) breaks.
 - 4) breaks down.
- 4 _You can't.....a fact easily unless you have enough information concerning the fact.
 - 1) estimate.
 - 2) predict.
 - 3) establish.
 - 4) patent.
- 5 _The.....of electronic research lies in setting free electrons from their atoms and controlling them for various purposes.
 - 1) function.
 - 2) groundwork.
 - 3) investigation.
 - 4) position.
- 6 _Rapid developments in computer software and hardware technology will make many present computer systems.....in a few years time.
 - 1) accessible.
 - 2) compatible.
 - 3) obsolete.
 - 4) operating.
- 7 _Before the quantum theory was put forward, there was no notion of natural units of radiant energy.
There was no notion, means.....
 - 1) there had not been any idea.
 - 2) there was a vague imagination.
 - 3) there was a clear concept.
 - 4) there had been no problem.

Since such pulses intrinsically occupy a huge amount of bandwidth, their energy is spread thinly over a large swath of the radio frequency spectrum - from a few hundred megahertz to several gigahertz. These frequencies are so high that they can be transmitted directly, without first being modulated onto a carrier, as is done with conventional radio systems like AM and FM broadcasts, cellular telephony, and Wi-Fi.

1 - Based on the text, the UWB technology was originally investigated by....

- | | |
|----------------------------|---------------------------------|
| 1) Military research | 2) Xtreme Spectrum |
| 3) Staccato Communications | 4) Discrete Time Communications |

► Exercise 2 (EE 84)

Both passive and active techniques of physical fault isolation depend on the physics of the failure mechanism itself. Not all defects emit light or are sensitive to photon stimulation. Not all generate a local temperature rise. Some techniques work only on open-circuited junctions while others require low-resistance leakage paths or short circuits. As such, these techniques are all defect-dependent and often a series of time-consuming test setup and fault isolation steps must be applied before success is achieved.

More serious is the need for physical access to an IC's internal structures - its gates, sources, drains, and metal interconnects. Numerous levels of wiring block the top or front-side silicon surface from emitting or absorbing light. Lines printed with the narrowest allowable spacing between them, buried under layers of insulator and conductive films, obstruct electron-beam access and can induce cross-talk problems. I/O circuits placed in an array across the surface of the IC obscure the front-side altogether, especially when the chip is flipped over either in its package or onto another chip.

2 - physical access to an IC's internal structure...

- 1) is needed in order to isolate physical faults
- 2) is eased by the existence of several levels of wiring
- 3) does not require any access to its gates, sources, drains and metal interconnects
- 4) is simplified through narrow lines buried under layers of insulation and conductive films



All essays mentioned here were **fully essay** in which all-body paragraphs supports the thesis statement at the end of introductory paragraph. However, there is another type of essay which is called **partial essay**. In this type of essay we do not have introductory paragraph and all paragraphs are body paragraph.

► Standard Questions:

As mentioned before, there is a systematic way for answering standard questions which is based on the standard structure of paragraph and an essay. Some of the standard questions and the way of answering them are presented here:

- What does the passage mainly discusses?

vision	بینایی
locomotion	حرکت و جابجایی
amphibious	خاکی آبی
intend	قصد داشتن
shallower	کم عمق
majority	اکثریت
deploy	گسترش دادن
launch	آغاز کردن
beach	ساحل
compact size	اندازه فشرده
coral reefs	تپه‌های مرجانی
collaborators	همکاران
serve	انجام دادن
inspection	بازرسی
shore lines	خط ساحلی
perform	انجام دادن
routine	عادی
release	آزاد کردن
bubble	حباب
intrusive	مزاحم
recognize	شناسایی کردن
stationary	ایستا
marine life	زندگی دریایی
let alone	چه برسد به

In order to answer this type of question you should read the thesis statement which is located at the end of introductory paragraph (first paragraph). If this question is asked for a paragraph instead of an essay, you should read the topic sentence which is usually placed in the beginning of that paragraph.

► *Exercise 3 (IT 85)*

Data processing is any computer process that converts data into information. The processing is usually assumed to be automated and running on a mainframe, minicomputer, or personal computer. Because data are most useful when well-presented and actually informative, data-processing systems are often referred to as information systems to emphasize their practicality. Nevertheless, both terms are roughly synonymous, performing similar conversions; data-processing systems typically manipulate raw data into information, and likewise information systems typically take raw data as input to produce information as output.

To better market their profession, a computer programmer or a systems analyst that might once have referred, such as during the 1970s, to the computer systems that they produce as data-processing systems more often than not nowadays refers to the computer systems that they produce by some other term that includes the word information, such as information systems, information technology systems, or management information systems.

In the context of data processing, data are defined as numbers or characters that represent measurements from the real world. A single datum is a single measurement from the real world. Measured information is then algorithmically derived and/or logically deduced and/or statistically calculated from multiple data. Information is defined as either a meaningful answer to a query or a meaningful stimulus that can cascade into further queries.

More generally, the term data processing can apply to any process that converts data from one format to another, although data conversion would be the more logical and correct term. From this perspective, data processing becomes the process of converting information into data and also the converting of data back into information. The distinction is that conversion doesn't require a question (query) to be answered. For example, information in the form of a string of characters forming a sentence in English is converted or encoded from a keyboard's key-presses as represented by hardware-oriented integer codes into ASCII integer codes after which it may be more easily processed by a computer - not as merely raw, amorphous integer data, but as a meaningful character in a natural language's set of graphemes - and finally converted or decoded to be displayed as characters, represented by a font on the computer display. In that example we can see the stage-by-stage conversion of the presence of and then absence of electrical conductivity in the key-press and subsequent release at the keyboard from raw substantially-meaningless integer hardware-oriented data to evermore-meaningful information as the processing proceeds toward the human being.

3 - The passage is mainly about....

- 1) changing data into information
- 3) the operation of a computer programmer

- 2) the uses of computers
- 4) the advantages of automated processing

snakelike	مارگونه
wave-power generator	تولیدکننده نیرو از موج
boosting	افزایش دادن
trickle	چکیدن
tidal	جزر و مدی
renewable	تجدید پذیر
variety	گوناگونی
come up	اتفاق افتادن
scheme	طرح
harness	مهار کردن
absorber	جذب کننده
comprise	شامل شدن
canister	محفظه
position	موقعیت
relative to	مرتبط با
joint	اتصال
hydraulic ram	تلمبه هیدرولیکی
installation	نصب

Passage 4:

goal	هدف
underwater vehicle	وسیله زیردریایی
autonomously	مستقلا
explore	جستجو کردن
aquatic environment	محیط آبی
surviving	زنده ماندن
harsh	سخت و دشوار
turbulent	متلاطم
challenging	چالش برانگیز
integration	مجتمع سازی

• **What can be the best title for the above passage?**

To give a title to an essay, first you should determine the essay's type. For a fully essay you should find the thesis statement at the end of introductory paragraph. If the passage is partial essay, you should look for the common points among the body paragraphs. The best title is the one which has both the main idea and controlling idea.



To give a title, you should notice that your answer should not be too general or too limited according to those discussed in the passage.



The title should be **interesting** to encourage the readers.

• **What is the conclusion for the above passage?**

Conclusion of a passage is usually located at the beginning of the conclusion paragraph (end paragraph). To find the conclusion of a single paragraph you should read the last part of that paragraph.

► **Exercise 4 (CE 84)**

In the heady, early days of computers, even sober scientists believed that machines would become "intelligent" and eventually start to think like us. That was the promise of artificial intelligence, or AI, in the 1950s, and in the 1960s, and in the 1970s.

Spectrum, over those decades, believed the gospel of AI evangelists. Among the many articles we ran on the imminence of machine intelligence was one 20 years ago. It prophesied in June 1984 that expert systems - programs that mimic human experts' ability to make decisions - would replace air-traffic controllers by the year 2000, and doctors and scientists within as few as 50 years.

The debate on whether machines were really intelligent was a favorite topic in conference halls and journal pages. Spectrum was no exception. "Intelligent systems will begin to make their way into the world, but few people will consider them to be really intelligent after all," wrote Robert Kahn in 1983. Kahn was one of the founders of the Internet and a former research director at the Defense Advanced Research Projects Agency, in Arlington, Va.

But the best assessment of AI turned out to be that of a June 1979 letter by reader Joseph Bates from Cornell University, in Ithaca, N.Y., who wrote: "I believe we are on the road to building artificial intelligence, but considering that we still have a trouble developing correct 10-line programs, it is likely to be a long journey." Bates was right, and the journey continues for AI

Passage 2:

covet	میل به تملک
light weight	سبک وزن
shock-resistant	خیلی مقاوم
solid-state	حالت جامد
secret	راز
Despite	باوجود
advantage	مزیت
suffer	تحمل کردن
enormous	عظیم
mix	ترکیب
boost	تقویت کردن
jacking up	افزایش دادن
traditional	سنتی
chunk	قطعه
sequential data	داده ترتیبی
frequent	مکرر
for instance	بعنوان مثال
update	به روز رسانی
merge	ترکیب کردن
prototype	نمونه اولیه یک محصول
employ	بکاربردن
comparatively	نسبتا
nonvolatile memory	حافظه غیرفرار
deal with	سروکار داشتن با

Passage 3:

commercial	تجاری
schedule	زمانبندی
lunch	شروع شدن

researchers. As for machines usurping humans, so far computers have made inroads on only a couple of fronts: telephone switchboards and grandmaster chessboards.

4 - If one had to give a title to the above passage which of the following would be the best choice?

- 1) The Evolution of Computers
- 2) The Evolution of Expert Systems
- 3) The Evolution of Artificial Intelligence
- 4) The Evolution of Machines as Usurpers of Humans

5 - Which of the following sentences best reveals conclusion of the passage?

- 1) Artificial Intelligence has replaced manpower.
- 2) Artificial Intelligence has still a long way to go.
- 3) The early days of computers are over and nowadays machines usurp humans.
- 4) Building of Artificial Intelligence is no exception to the developments that were prophesied earlier.

► Exercise 5 (IT 83)

When scaling a monitoring system to thousands of entities around a large network, you can find that network links become clogged just from the monitoring traffic. To solve this problem, some monitoring systems have remote probes that collect data and only send summaries back to the master station. If these are strategically placed around the network, they can greatly reduce the amount of network traffic generated. The master station stores the data and makes it available to the SAs. The master station also holds the master configuration and distributes that to the remote monitoring stations. This model scales much further than a single monitoring station or multiple unrelated monitoring stations.

Real-time monitoring systems also have scaling problems. When such a system is watching many aspects of many devices, there will always be some things that are "red," indicating some form of outage requiring attention. To scale the system appropriately, the SAs must be able to tell at a glance which of the "red" issues is the "reddest" and having the most impact. Essentially, the problem is that a monitoring system typically only has a few states to indicate the condition of the monitored item. Often there are only three: "green," "yellow," and "red." Monitoring many things requires a finer granularity. For example, a very granular priority system could be built in, and the reporting system could display the problems in a priority-ordered list.

6 - The best title for the passage would be.....

- | | |
|---|---|
| 1) How to Make Network Links | 2) The Functions of Large Networks |
| 3) The Two problems of Monitoring Systems | 4) The Definition of the Monitoring Traffic |

► Exercise 6 (IT 85)

In the 1990's as organizations of scale began to need more timely data about their business, they found that traditional information systems technology was too cumbersome to provide relevant data efficiently and quickly. Completing reporting requests could take days or weeks using antiquated reporting tools that were designed more or less to "execute" the business rather than "run" the business.

Important Vocabularies

Passage 1:

lunar	قمری
expedition	تسریع کردن
prototype	نمونه اولیه یک محصول
vehicle	وسیله
logistical	پشتیبانی
carry out	انجام دادن
involve	درگیر شدن
equipment	لوازم
offer	پیشنهاد دادن
serve	انجام دادن
spot	محل-مکان
roughly	بطور کلی
simulated	شبیه سازی شده
astronaut	فضانورد
suspension	معلق شدن
truck	کامیون
independently	بطور مستقل
wheel	چرخ
fail	خراب شدن
mission	ماموریت
chief	رئیس
compressed schedule	برنامه زمانی فشرده
expert	خبیره
review	بازبینی
tote	حمل کردن
drill	مته

From this idea, the data warehouse was born as a place where relevant data could be held for completing strategic reports for management. The key here is the word "strategic" as most executives were less concerned with the day-to-day operations than they were with a more overall look at the model and business functions.

As with all technology, over the course of the latter of the 20th century, we saw increased numbers and types of databases. Many large businesses found themselves with data scattered across multiple platforms and variations of technology, making it almost impossible for any individual to use data from multiple sources. A key idea within data warehousing is to take data from multiple platforms/technologies (as varied as spreadsheets, DB2 databases, IDMS records, and VSAM files) and place them in a common location that uses a common querying tool. In this way operational database could be held on whatever system was most efficient for the operational business, while the reporting/strategic information could be held in a common location using a common language. Data warehouses take this even a step further by giving the data itself commonality by defining what each term means and keeping it standard. An example of this would be gender which can be referred to in many ways, but should be standardized on a data warehouse with one common way of referring to each sex .

All of this was designed to make decision more readily available and without affecting day-to-day operations. One aspect of a data warehouse that should be stressed is that it is not a location for all of businesses data, but rather a location for data that is "interesting. II Data that is interesting will assist decision makers in making strategic decisions relative to the organization's overall mission.

7 - The best title for the passage would be.....

- 1) Information Systems Technology
- 3) The Uses of Large-Scale Data

- 2) The Promise of Data Warehousing
- 4) The Organization of Business Data

► Exercise 7 (CE 85)

Are your running shoes too hard for running on asphalt? Too soft for a dirt track? No matter, because, according to Adidas-Salomon AG, in Herzogenaurach, Germany, the Adidas I running shoe will continually adjust the firmness of its heel to make sure it always feels right: softer on concrete, firmer on grass, for example.

The preferred firmness of a cushion in the heel is selected when you push either of two buttons on the side of the shoe, one carrying a plus sign, the other a minus. These in turn activate a motor that tightens or relaxes a steel cord to give the heel its variable firmness. Five light-emitting diodes on each shoe indicate the firmness levels. The hollow plastic cushion in the heel contains a Hall Effect sensor, which reads the strength of an electromagnetic field created by a magnet near the bottom of the heel. As the runner's foot strikes the ground and the plastic cushion is compressed, the sensor measures the change in field strength. It sends this data to an embedded 20-megahertz microprocessor in the shoe's arch, which calculates to within 100 micrometers just how much the cushion has been compressed, and adjusts the cord tension to maintain a constant level of firmness no matter what you're running on. This cycle of sensing, measuring, and adjusting happens 10000 times a second. You won't notice the cord's tension changing until

than the density of a gate capacitor built in the same technology. The need for additional masks process steps makes these capacitors more expensive compared to other types of capacitors. Double-poly capacitors and MIM capacitors are highly linear and have high quality factors, but due to the cost overhead, they are generally not available in standard digital processes.

29 - According to the text, are linear and posses high Q factor.

- | | |
|------------------------|------------------------------|
| 1) gate capacitors | 2) junction capacitors |
| 3) switched capacitors | 4) metal-to-metal capacitors |

30 - What makes MIM capacitors unsuitable for standard digital processes?

- 1) their nonlinearity
- 2) higher mask and processing cost
- 3) use of thicker oxide to achieve the desired density
- 4) low capacitor density compared to standard metal-to-metal capacitors

you start moving, because the motor is activated only when the foot is in the air. This ensures that it is not wasting energy by fighting against the runner's weight.

8 - Considering the features of the given shoes, which of the following would be the best title for the above passage?

- | | |
|-----------------------------|------------------------------------|
| 1) Smart Shoes | 2) Adidas I Running Shoes |
| 3) Adjustable Running Shoes | 4) Adidas-Salomon AG Special Shoes |

► Exercise 8 (CE 82)

China's shift from technological nationalism to a more pragmatic strategy of developing national capabilities in conjunction with multinational corporations has transformed its economy. Consistent with this transformation, china has revamped its industrial and technology policies, moving from an isolationist approach aimed at achieving technological independence to become a major producer of computer hardware and a major market for information technology products.

In 1990, china had only 500,000 PCs in a country of more than 1.2 billion people. By 2000, mainland Chinese purchased more than seven million PCs in a year. During the same time, china's production of computer hardware grew from fewer US \$ 1 billion to US \$ 23 billion.

Asian pacific economies such as Japan, Korea, Taiwan and Singapore, each of these became leaders in different segments of the global computer industry through the strong support of government industrial and technology policies.

9 - If you were to choose a title for the above passage, which of the following would best fit with context of the passage? China's.....

- | | |
|------------------------|-------------------|
| 1) computer technology | 2) transformation |
| 3) corporations | 4) development |

• The paragraph preceding the passage would most likely be about?

As mentioned before, each paragraph has relationship with its preceding and following paragraphs. According to the chain rule, to find the topic of the preceding paragraph you should notice to the beginning of the given paragraph.

• The paragraph following the passage would most likely be about?

Similar to the previous question, according to the chain rule, to find the topic of the following paragraph you should read the ending part of the given paragraph.

► Exercise 9 (Parseh CE 87)

Time redundancy methods attempt to reduce the amount of extra hardware at the expense of using additional time. In many applications, the time is of much less importance than the hardware because hardware is a physical entity that impacts weight, size, power consumption, and cost. Time, on the other hand, may be readily available in some applications. The basic concept of time redundancy is the repetition of computations in ways that allow faults to be detected. Time

time, unlike charge states, which are easily destroyed by scattering or collision with defects, impurities or other charges.

These characteristics open the possibility of developing devices that could be much smaller, consume less electricity and more powerful for certain types of computations than is possible with electron-charge-based systems. Those of us in the spintronics (short for spin electronics) community hope that by understanding the behavior of electron spin in materials we can learn something fundamentally new about solid state physics that will lead to a new generation of electronic devices based on the flow of spin in addition to the flow of charge. In fact, the spintronics dream is a seamless integration of electronics, optoelectronics, and magnetoelectronics multifunctionality on a single device that can perform much more than is possible with today's microelectronic devices.

27 - The comparison made between the spin and the compass needle....

- 1) clarifies the subject matter
- 2) notifies the electron properties
- 3) exemplifies the magnetic field
- 4) clarifies the movement of compass needle

28 - The information in the last paragraph supports which the following conclusions?

- 1) spintronics is based on the flow of spin
- 2) spintronics can led to the development of more powerful microelectronic devices
- 3) it is not realistic to understand the behavior of electrons in materials
- 4) smaller devices are now made by the integration of electronics, optoelectronics, and magnetoelectronics multifunctionality on a single chip

Passage 7

Capacitors are one of the crucial elements in integrated circuits and are used extensively in many applications such as data converters, sample and holds, switched-capacitor circuits, radio-frequency oscillators, and mixers. Capacitors can occupy a considerable area in the integrated circuit designs. Therefore, an area-efficient capacitor is highly desirable. The problem is more pronounced in modern process technologies where the vertical spacing of the metal layers does not scale much, if at all. There are four types of capacitors which have been commonly used in IC design. There are gate capacitors, junction capacitors, conventional metal-to-metal/poly capacitors and thin-insulator capacitors. Gate capacitors have a high density- i.e. high capacitance per unit area. However, they are nonlinear and require a dc bias voltage to operate. Moreover, gate capacitors have a low breakdown voltage due to the thin gate oxide, and also have a medium quality factor. Junction capacitors suffer from some of the above problems as well. They are highly nonlinear, and need a dc bias voltage. In addition, factors such as their sensitivity to process variations, poor quality factor, and large temperature coefficient limit their use in many applications. Metal-to-metal and metal-to-poly capacitors, on the other hand, are linear and have high Q. They also exhibit very small temperature variations. Unfortunately, the density of a traditional metal to metal capacitor is very low due to the relatively thick inter-level oxide layers. The problem becomes more severe with scaled technologies since the vertical spacing of the metal layers stays relatively constant. As a result, standard parallel plate capacitors consume a larger percentage of the die area as technologies scales down. There has been a recent growth in the use of thin-insulator capacitors in IC applications. Double-poly capacitors and metal-insulator-metal (MIM) capacitors use a thin oxide to achieve high density. The capacitance density is much higher than the density of standard metal-to-metal capacitor, but it is slower

redundancy can function in a system in several ways. The fundamental concept is to perform the same computation two or more times and compare the results to determine if a discrepancy exists. If an error is detected, the computations can be performed again to see if the disagreement remains or disappears. Such approaches are often good for detecting errors resulting from transient faults but cannot provide protection against errors resulting from permanent faults.

The main problem with many time redundancy techniques is assuring that the system has the same data to manipulate each time it redundantly performs a computation. If a transient fault has occurred, a system's data may be completely corrupted, making it difficult to repeat a given computation. Time redundancy has been used primarily to detect transients in systems. One of the biggest potentials of time redundancy, however, now appears to be the ability to detect permanent faults while using a minimum of extra hardware.

10 _ The paragraph following the passage would most likely be about?

- 1) permanent faults detection.
- 2) transient faults detection.
- 3) other ways of hardware reduction.
- 4) advantages of time redundancy methods.

► **Exercise 10 (Parseh EE 87)**

High-electron-mobility transistor, or HEMTs are remarkable devices because they overcome a fundamental problem of solid-state physics. Semiconductors, as their name implies, normally don't conduct electricity all that well. Usually, they must be doped with other kinds of atoms to become electrically conductive. But those impurities tend to interfere with the movement of electrons through the semiconductor's crystal lattice, limiting the conductivity that can be obtained.

In HEMTs, electrons are introduced into a III-V semiconductor not by doping but by placing the material in contact with another III-V compound that is doped. In essence, electrons fall a short distance into the undoped material, allowing a thin layer of it—the channel—to conduct electricity extremely well whenever the transistor is switched on.

HEMTs can be used singly or in integrated circuits with, say, 100 or even 1000 of them clustered together, but they can't yet work for microprocessors. The problem is that too many of the electrons that are supposed to flow through the channel from the transistor's source electrode to its drain instead seep out the controlling input electrode—the gate—creating heat. With millions of leaky transistors crowded together on the same chip, things would quickly get hot enough to melt.

In a silicon MOSFET, a layer of intervening insulation (traditionally silicon dioxide) prevents electrons from slipping out of the channel into the gate. In a HEMT, the channel is separated from the gate by a semiconductor, which, as you might expect, is somewhat conductive. What's needed here, of course, is an insulator, but for decades there have been no good gate insulators available for gallium arsenide. From time

Passage 5

Cost overruns and project delays have led to a cloudy forecast for United States' new polar-orbiting weather satellites, which were originally supposed to start circling the North and South Poles in 2008. The greatly upgraded satellites, to consist of a group of three with three replacements, are meant to beam back weather data that would enable scientists to better predict hurricanes such as Katrina. But development of the satellites is far behind schedule and their total estimated cost has ballooned from US \$6.5 billion to more than \$10 billion. Consider that the whole annual budget for Earth observation from space is about \$3 billion.

The new satellites would improve long-term weather prediction by producing more detailed images of ocean surface temperatures and winds, ocean color, land surface temperatures, terrestrial vegetation, and land cover characteristics. They also transmit that information at much higher speed than is currently possible. The 22-channel VIIRS will provide complete global coverage of Earth in one day, base on infrared imaging, yielding the first-ever color pictures to be seen from a satellite in real time. This improved fidelity will allow a closer look at the intensity of particular weather patterns, because the cameras won't just look at the top of the clouds but will be able to peer into hurricanes and drag out data on their interior temperature and moisture, information U.S. forecasters now get from less-cable sensors mounted on aircraft.

- 25 - The new polar-orbiting satellites project has (a) ----- problems (s).
- 1) financial
 - 2) technical
 - 3) financial and schedule
 - 4) financial and technical
- 26 - The color pictures sent by new satellites will be notable because-----.
- 1) of their real-time operation
 - 2) of their long-term weather predication
 - 3) it will be the first time that a satellite sends high fidelity pictures
 - 4) they provide complete global coverage of the Earth for the first time

Passage 6

The last half of the 20th century could be called the microelectronics era. During that 50-year period, the world witnessed a revolution based on a digital logic of electronics. Form the earliest transistor to remarkably powerful microprocessor in your desktop computer, most electronic devices have employed circuits that express data as binary digits, or bits. Furthermore, the communication between microelectronic devices occurs by the binary flow of electric charges.

Recently, investigators have been eager to exploit another property of the electron- a characteristic known as spin. Spin is a purely quantum phenomenon roughly akin to the directional behavior of compass needle. Electrons have spin of a sort in which their compass needles can point either "up" or "down" in relation to a magnetic field. Spin therefore lends itself elegantly to a new kind of binary logic of ones and zeros. The movement of spine, like the flow of charge, can also carry information among devices. One advantage of spin over charge is that spin can be easily manipulated by external applied magnetic fields, a property already in use in magnetic storage technology. Another more subtle (but potentially significant) property of spine is its long coherence, or relaxation, time-once created it tends to stay that way for a long

to time over the years, researchers seem to uncover a promising material, but nothing ever really panned out—until recently.

11 - The paragraph following the passage would most likely be about?

- | | |
|------------------------------|---|
| 1) HEMT integrated circuits. | 2) gate insulator for gallium arsenide. |
| 3) silicon dioxide. | 4) a promising material. |

• The passage can be summarized as.....

In the multiple choice questions you are usually asked to find the summary of a passage not a paragraph. Before finding the summary, you should determine the tone of passage. Tone of a passage can be either *totally negative*, *mostly negative*, *conditional*, *mostly positive*, or *totally positive*. You should do it according to the sentences, examples or writer's point of view.



If tone of the passage is *totally negative* or *totally positive*, you should look for a *simple sentence* among the choices which is negative or positive respectively.



If tone of the passage is *conditional* which means being half positive and half negative, you should choose a *compound sentence* whose simple sentences are joined together by *contrast* connectors such as *however*, *on the contrary*, *on the other hand*, *still*, *nevertheless*, and so on.



If tone of the passage is *mostly negative*, you should choose a *complex sentence* whose main clause is negative and its subordinated clause is positive.



If tone of the passage is *mostly positive*, you should choose a *complex sentence* whose main clause is positive and its subordinated clause is negative.

► **Exercise 11 (CE 82)**

For intelligent systems research in e-business to have real impact, we need to cross the existing borders between computer science and economic and management science. Truly interdisciplinary progress in science appears difficult to achieve because of the traditional decomposition into disciplines, which can turn different academic fields into almost separate cultures. Nevertheless, the contributors to this special issue on intelligent e-business hope to show how interdisciplinary thinking has, helped to advance e-business.

E-business implies that information technology must prove itself in an interactive and distributed context of economic value creation. Technology push and market pull both play their role in driving e-business forward.

20 - How the electric power is generated in the tidal wave generators?

- 1) turbines are armed by the oxygen tanks.
- 2) hydraulic pistons pressure the oil inside the turbines
- 3) hinged joints in the canisters are pulled by the arms
- 4) giant oxygen tanks pressure the oil through the turbines

21 - It is expected that

- 1) United Kingdom will lead long canister fabrication
- 2) Portugal will lead the research in the development of ocean energy
- 3) Portugal will have the highest capacity of tidal waves energy use the long run
- 4) in the long run Scotland will have the largest installation of ocean energy harvest

Passage 4

Our goal is to develop an underwater vehicle that can autonomously explore and collect data in aquatic environment while surviving the harsh saltwater conditions and often turbulent waters of the open sea. In building Aqua, we are tracking one of the most challenging topics in robotics: integration vision and locomotion into an amphibious machine that can determine what is "seeing," where it is and where it is going. Unlike many earlier UVs (under water vehicle), Aqua is intended for shallower waters, and its design reflects this. Although the majority of UVs are large and unwieldy-some require a crane to lower them into the water- Aqua only measures only 50 by 65 by 13 centimeters and weights just 18 kilograms. Aqua is thus easier to deploy: you can literally throw it into the water, or it can launch itself from the beach.

Even though Aqua's compact size and amphibious locomotion make it ideal for operating around coral reefs, some of our collaborators have other ideas for the robot. They believe Aqua could serve as the basis for other robotic machines that could do environmental inspections in deep water or near shore lines; perform routine monitoring in aquacultures; and also help human drivers with predrive safety checks and physical tasks underwater.

Aqua, which releases no bubbles and is much smaller than a human, can collect similar data using its underwater cameras while being less intrusive to fish. True, Aqua can't yet recognize coral or other stationary marine life, let alone moving fish. But the video data the robot collects can be analyzed by an expert.

22 - Why was Aqua built?

- 1) to understand "what is seeing?"
- 2) to prove that an amphibious machine can be built.
- 3) to find a solution for one of the most challenging topics in robotics.
- 4) to independently and safely collect data from harsh under water environments.

23 - Which statement is true?

- 1) Aqua is as big as many other UVs.
- 2) It is hard to throw Aqua into water.
- 3) UVs usually can launch themselves into water.
- 4) Many earlier UVs were made for exploring deep waters.

24 - The text implies that the designers of Aqua think that in the future the machine....

- 1) can be less intrusive to the fish
- 2) can send better video data
- 3) will be able to work with human beings
- 4) might be able to recognize stationary marine life

- 12 - The first paragraph can best be summarized as.....
- 1) Despite the fact that interdisciplinary progress in science seems difficult to achieve, e-business scholar try to prove it helpful in this respect
 - 2) The traditional decomposition of science into disciplines has brought about crucial difficulties for researchers developing e-business
 - 3) The impression of e-business on economic and management sciences has caused scholars to consider interdisciplinary concept helpful in the advance of e-business
 - 4) Although intelligent systems research in e-business may seriously affect other field of science, some students hope to follow it up through interdisciplinary approach
- 13 - How does the second paragraph logically relate to the first? It.....
- 1) disagrees with the idea that sciences are to follow the traditional classification
 - 2) Presents information technology as the fundamental element in e-business advancement
 - 3) Support the idea that there exists a close interrelation between the sciences of computer and economy
 - 4) Suggests the ways to be studied by the students of computer in relation to economy, management and computer science

► Exercise 12 (TT 83)

As a general rule, the more information serves to reduce the element of uncertainty in the decisions made by managers at all levels, the greater is its value. But like other basic resources available to managers, information is usually not free. The cost of acquiring information must usually be compared with the benefits to be obtained from its use. Just as it's economically foolish to spend \$100 to mine \$75 worth of coal; likewise, it is unsound to produce information costing \$100 if this information doesn't lead to actions that yield a greater return. Generally speaking, information that processes the properties of accuracy, timeliness, completeness, and conciseness will be more valuable than information lacking one or more of these characteristics. However, compromises are often made in one or more of these properties for economic reasons.

- 14 - Which of the following best summarizes the text?
- 1) Managers highly value all resources they use
 - 2) It is unwise to obtain information expensively
 - 3) Managers base their information requirements on economy
 - 4) Information must have the characteristics needed by managers to confer benefits

• We may conclude from the passage that.....

To find the conclusion of a paragraph you should read the last part of the paragraph. However, the conclusion of a passage is usually located at the conclusion paragraph (last paragraph). Conclusion can be identified with terms like: so, therefore, as a result, thus, hence, consequently and so on.

► Exercise 13 (EE 85)

The MASSPOWER project and its development represents a future model for how power generation projects may be put together in the new competitive energy arena in the United States

Passage 2

The PRICEY MacBook Air you covet, with its small, light weight, shock-resistant solid-state drive (SSD), may have a secret. Despite their advantages, solid-state drives suffer not from enormous price tags but also from slow performance during certain key operations. Now Korean engineers report that through a clever mix of two types of memories, they can give solid-state drives a boost without also jacking up their price.

Unlike a traditional hard-disk drive, which can write new data directly over recorded data, the NAND flash memory that makes up solid-state drives requires free memory space in which to write. That's usually not a problem when you have to write large chunks of sequential data, such as a video clip. But it is a problem when you have to make frequent small additions and changes to existing data. If for instance, you need to update a file the original data must be copied to a fresh memory block so that the first block can be erased. The new data can be merged with the original and written back to the first block.

But as engineers at Seoul National University in South Korea report in a recent issue of IEEE Computer Architecture Letters, there's a better way. They developed a prototype solid-state drive, dubbed Chameleon that employs a small amount of ferroelectric RAM (FRAM), a comparatively expensive niche nonvolatile memory, to more efficiently deal with such small data changes.

18 - Solid-state drives.....

- 1) are widely used in present days
- 2) are very efficient in replacing data
- 3) benefit from low price tag to replace hard-drives
- 4) suffers from the incapability to rewrite data over recorded ones

19 - The Korean researchers.....

- 1) have basically developed MacBook Air
- 2) have reduced the price of ferroelectric RAM's
- 3) have made a new SSD using ferroelectric material
- 4) have developed a new type of FRAM

Passage 3

The first commercial ocean energy project is scheduled to launch this summer off the coast of Portugal. Three snakelike wave-power generators built by Edinburgh's Pelamis Wave Power will deliver 2.25 megawatts through an undersea cable to Portuguese coastal town of Agucadoura. Within a year, another 28 generators should come online there, boosting the capacity to 22.5 MW. That may be a trickle of power, but the project represents a new push into wave and tidal power as governments eye the ocean as a way to meet their renewable energy targets.

Engineers have come up with a variety of schemes to harness the power of waves, the flow of currents, and the motion of the tides. The Pelamis generators, part of the class of wave-energy convertors called linear absorbers, each comprise three long canisters that look like giant oxygen tanks. Hinged Joints link the canisters; when the waves change the segments' position relative to one another, the joints push hydraulic arms, which pump high pressure oil through the turbines inside the canisters.

Through Portugal may be the site of the first commercial installation, the UK-Scotland in particular leads in the research and development of ocean energy and is expected to end up with the most installed capacity in the coming years, say experts. Pelamis's generator was first tested at the European Marine Energy Center (EMEC), which is located amid the Orkney Island off Scotland's northeastern coast.

and in many countries throughout the world. Gone are the days when electric utilities built large central generation stations on a cost-of-service basis as the only alternative to providing electric power and gone also are the early days of cogeneration when thinly capitalized entrepreneurs obtained power contracts while working out of their suitcases. The advent of formal competitive bidding programs as the way of supplying new electric power has expedited the maturing of the non-utility power generation industry. The survivors of the inevitable consolidation we are currently witnessing will need to take considerable market and financial risk before reasonable assurance can be obtained about a project's success. MASSPOWER was one of the first projects to be developed in this new climate and to have such a significant amount of development capital put at risk. Understanding its development process can help us understand what it will take to be successful at profitably building power plants in the future.

15 _ We may conclude from the passage that ...

- 1) the project initially conceived should be centered around important factors
- 2) MASSPOWER project will be of little success unless profitable power plants are developed
- 3) if all the details of the development process are digested, the MASSPOWER project can be a success
- 4) the entrepreneurs should have the required knowledge and skills to plan improved strategies

► *Exercise 14 (IT 83)*

Philosophers have studied the nature of intelligence since ancient times. In modern times, researchers from other fields, including psychology, cognitive science, and AI have joined the debate. Unfortunately, while we can define some abilities related to intelligence, such as learning or reasoning, with some precision, the word intelligence means different things to different people. Humans are intelligent, everybody seems to agree. But are animals intelligent? Is a computer running a medical expert system intelligent? In the larger picture, is sentience even possible for a silicon-based entity such as HAL 9000 ?

One precondition for intelligence seems to be responsiveness to external stimuli. That is, an agent must perceive something about its environment and be able to perform appropriate actions as conditions change. Let's call this the animate criterion. This does not mean an agent must have a camera or a robotic arm; merely that it has some means of input and output. This might be as simple as a text-based system. The point is that an agent should not always emit the exact same response; at the least, some changes in its input should lead to changes in its output. Certainly we would not consider intelligent a robot that just sat on a table or drove forward. Given that perception and action are definitely required, determining such a system's intelligence comes down to judging its actions' appropriateness in light of the prevailing conditions.

16 _ It may be concluded from the second paragraph that the problem facing modern engineers is...

- 1) to develop robots whose actions are similar to those of humans
- 2) how to analyze the process in which stimulus-response takes place
- 3) how to provide for intelligent connection of perception to action
- 4) to develop a system capable of adjusting itself to input/output changes

- 13 _
 1) to be 2) out of 3) of 4) in order to be
- 14 _
 1) if 2) so that 3) rather than 4) less than
- 15 _
 1) whether 2) what 3) how long 4) as soon as

Part C: Reading Comprehension

Passage 1

NASA may not return to the moon for another 10 years, but that is not stopping the U.S. space agency from conducting lunar expedition.

In June, research teams from seven NASA centers gathered at Moses Lake, in central Washington State, to test prototypes for new moon-worthy robots, vehicles, and spacesuits. During the tow-week-long field test, the teams and their machines replaced logistical and scientific operations that might be carried out on the moon.

It was the first time that all the centers were involved in such a test, which gave the teams a chance to see how well the equipment they'd designed played with others.

The field test also offered a "much broader area to stretch you legs," says Bill Bluethmann, a robotics engineer at NASA's Johnson Space Center, in Houston, who served as the expedition's leader. Moses Lake boasts 1200 hectares of sand dunes, popular with the off-road crowd. NASA liked the spot, too, because the loose sand and treeless horizon roughly simulated the lunar surface.

Among the vehicles fielded was a gold-toned, six-wheeled lunar truck called Chariot. Intended to carry up to four suited astronauts, Chariot has an active suspension that lets any part of the truck be lifted and lowered independently.

"If one wheel fails, we can just pick it up and continue mission," says Lucien Junkin, the vehicle's chief engineer. Chariot was designed and built in just 12 months. Under such a compressed schedule, he says, the team because experts at "5-minute design reviews." Also on hand was a four-wheeled lunar prospecting robot called Scrab, which can operate in daylight as well as night, Build by the Robotics Institute at Carnegie Mellon University, in Pittsburgh, the robot totes a 1-meter-long drill for taking geological samples.

- 16 _ Why were the test performed near the Moses Lake? Because....
 1) the are was nearest to Washington D.C.
 2) there were enough sand dunes to stretch your legs.
 3) robotic engineers though the robots were moon-worthy
 4) the widely-spanned sand-covered are resembled the moon surface.
- 17 _ The Chariot....
 1) is a 4 wheel drive, 4 astronaut carrying truck
 2) has been built using a 5 minute design review
 3) is a vehicle which can carry a few astronauts with 6 independently suspended wheels
 4) is a 4 wheel drive vehicle built in 12 months Carnegie Mellon University

► Exercise 15 (CE 82)

Although Linux has yet to achieve wide popularity in the computer game work, making rapid progress toward becoming the dominant operating system in the other major entertainment arena: motion pictures. The Linux operating system initially found a niche for use in computer-generated image rendering for film.

With the success of films such as Toy Story and Titanic, most major motion picture studios now employ CGI and strive to reduce the costs of using this expensive technology. Given the many systems that run it and the numerous applications that support it, film makers can now use Linux animation and rendering. Thus, when we see the entire film industry adopting Linux to remote cost - and performance competitive, how can we help but wonder what new realms Linux may conquer next?

17. According to the passage which of the following statements would best be the conclusion of this passage? Linux.....

- 1) has still new realms to conquer in the future
- 2) has had great achievements in the motion pictures industry
- 3) is used for an animated feature's entire production process
- 4) is the only operating system used in the motion pictures industry

EE 88

Part A: Vocabulary

- 1 - It is not possible for human beings to ----- precisely the time of death.
1) elicit 2) enumerate 3) invoke 4) pinpoint
- 2 - Educational standards are ----- year by year because of a lack of funds.
1) preceding 2) overlapping 3) degenerating 4) restricting
- 3 - Your success is a ----- to all your hard work.
1) testimony 2) partnership 3) requisite 4) compliment
- 4 - Statistical ----- can make it difficult to compare data from one year to the next.
1) version 2) anomalies 3) simulation 4) proportions
- 5 - The chemicals are ----- to environment.
1) exhaustive 2) contrastive 3) detrimental 4) forthcoming
- 6 - After doing this project, we will ----- a new project later this year.
1) bear on 2) break up 3) stand out 4) embark on
- 7 - The soil in this part of the world is not rich enough to ----- a large population.
1) survive 2) sustain 3) suspend 4) submit
- 8 - He felt that graduating from the university was a real ----- in his life.
1) enormity 2) milestone 3) coherence 4) orientation
- 9 - They purchased a (n) ----- of 3,000 shares in the company.
1) welfare 2) revenue 3) aggregate 4) quantification
- 10 - Do you think that these higher-than-average temperatures are ----- to global warming?
1) attributable 2) expansive 3) convertible 4) substitutional

Part B: Grammar

Are some people born clever and others born stupid? Or is intelligence developed by our environment and our experience? (11)-----, the answer to both of these questions is yes. To some extent, our intelligence is given us at birth, and (12)-----special education can make a genius (13)----- a child born with low intelligence. On the other hand, a child who lives in a boring environment will develop his intelligence (14)----- one who lives in rich and varied surroundings. Thus, the limits of a person's intelligence are fixed at birth, but (15)----- he reaches those limits will depend on his environment. This view, now held by most experts, can be supported in a number of ways.

- 11 -
1) Too strange 2) Too strangely
3) Strangely enough 4) Strange enough
- 12 -
1) no amount of 2) amount of no
3) there is amount of no 4) there is not amount of

Lesson 8

Defining Vocabulary In Context

Sometimes in your reading, you come across words or phrases that are unfamiliar to you. How can you understand the passage if you don't know what all of the words mean? Remember that often a single word will not prevent understanding the overall meaning of the passage. Since you do not have dictionary in the exam, you should do your best to understand the new words from the rest of the passage (the context).

► *Example:* Read the following paragraph carefully. Try to guess the meaning of the underlined word.

Most reality TV shows center on two common motivators: fame and money. The shows transform waitresses, hairdressers, investment bankers, counselors, and teachers, to name a few, from obscure figures to household names. A lucky few successfully parlay their 15 minutes of fame into celebrity. Even if you are not interested in fame, you can probably understand the desire for lots of money.

► **What does obscure mean?**

Even if you have no idea what *obscure* means, you can still learn about the word by how it is used, by examining the words and ideas surrounding it. This is called determining word meaning through *context*. Like detectives looking for clues at a crime scene, we must look at the passage for clues that will help us define this word.

So, given the sentence we have here, what can we tell about obscure? Well, since the shows transform waitresses, hairdressers, investment bankers, counselors, and teachers from one position—obscure figures, to another position—household names, that immediately tells us that an obscure figure and a household name are two different things.

Furthermore, we know from the sentence that the people in question are involved in typical, everyday jobs (waitresses, hairdressers, bankers, etc.) and that from this position, they are transformed into household names, which means they achieve some level of fame and notoriety. Now you can take a pretty good guess at the meaning of obscure.

- Before they become household names, the waitresses, hairdressers, investment bankers, counselors, and teachers are:

regarding	در خصوص
wattage ranges	محدوده توان
base stations	ایستگاه
consensus	توافق
hazard	خرابی
proximity	نزدیکی
exposure	در معرض
absolutely	کاملاً
precautionary	روش پیشگیرانه
approach	
adults	بزرگسالان
conversations	مکالمات
discourage	دلسرد کردن
extended use	استفاده طولانی
involve	شامل
radiation	تشعشع
indicate	مشخص کردن
significantly	بطور قابل ملاحظه
dangerous	خطر
drunk	مست

- a) famous and notorious.
- b) unknown and undistinguished.
- c) unique and distinctive.

The correct answer, of course, is b. It certainly can't be a, because we know that these people are not yet famous. The reality shows will make them famous, but until that happens, they remain obscure. Answer c doesn't really make sense because we know from the passage that these people are waitresses, hairdressers, investment bankers, counselors, and teachers. Now, these are all very respectable jobs, but they are fairly common, so they wouldn't be described as unique or distinctive. Furthermore, we can tell that b is the correct answer because we can substitute the word obscure with the word unknown or undistinguished in the sentence and both would make sense.



When you are asked to find the meaning of a word in a passage or sentence, it is usually expected to guess its meaning through context (it is not supposed to know it previously).



You can guess the meaning through **transitions**. These expressions are clues that can help you understand the relationship ideas within sentences and paragraphs. For example, connector **and** shows addition, **or**, **but**, **yet** show contrast. In the following, other transitions are listed:

FUNCTION	TRANSITIONS		
Illustrate	for example for instance	next to illustrate	such such as
Explain	at this point because	furthermore how	in fact in this case
Give Reasons	as a result of because	because of due to	one reason is since
Show Result	accordingly as a result	consequently otherwise	therefore thus
Compare	both equally important	like the same	similarly similar to
Contrast	although conversely however in contrast	instead nevertheless on the contrary on the other hand	rather unlike whereas while
Add	also another as well as	finally first, second, third... furthermore	moreover not only...but also too
Limit	although but	except for even though	however yet
Emphasize	certainly clearly	indeed in fact	most importantly surely

capture	بدست آوردن
well-traveled routes	مسرهای پر تردد
establish	تاسیس کردن
reinforce	مجبور کردن
demonstrators	نمایش دهنده‌ها
implement	پیاده سازی
project partner	همکار پروژه
threshold	آستانه
particularly	مخصوصاً
representation	نمایش
exploit	استخراج کردن
mimic	تقلید کردن
approach	روش
prototyping	ساخت نمونه اولیه
ease	ساده کردن

Passage 4:

cordless	بی سیم
hand-held radios	رادیوهای دستی
timeless	نامناسب
tissue	بافت
widespread	گسترده
concern	موضوع نگران کننده
adverse	مخالف
brain cancer	سرطان مغز
conduct	انجام دادن
rule out	رد کردن
reasonable	معقول
confidence	اطمینان
association	مرتبط

► *Example 1:* What does refine mean?

Storm's creators, whoever they are, continue to modify and refine their malevolent progeny even as it already stands as a dark cloud poised over the Internet.

► *Example 2:* What does moderately mean?

Although Microsoft's products are currently used in any private companies, they are moderately used in public organizations.

► *Example 3:* What does perceptual mean?

This hardware can do complex perceptual tasks such as recognizing objects by sight.

► *Example 4:* What does sluggish mean?

Organic semiconductor circuits are sluggish compared with silicon, because the mobility of charge carriers is low. This isn't a problem for the logic circuitry and memory, because the amount of data to be processed is very small (several hundred bytes of memory suffice for the smaller RFIDs). But it is a problem in the diodes that rectify the high-frequency current obtained from the reader in order to power the RFID's circuitry and transmitter.

► *Example 5:* What does autonomic mean?

The electronic system of the future will monitor itself, change the functions it performs, and repair its damaged circuits - all without external intervention. Such is the dream of autonomic computing. Although the dream is not yet a reality, engineers and scientists have taken a big step forward with the development of an on-chip fuse that is electrically blown - or programmed - by using a physical effect that is usually considered to be a serious reliability problem in semiconductor circuits.



You can also guess the meaning of a word through **appositives, clauses, and punctuations** by giving more information. *Appositive* is a word or phrase which explain another word or phrase. In English grammar, *clause* is a group of words, consisting of a subject and a finite form of a verb, which might or might not be a sentence. *Punctuation* mark is a mark that you add to a text to show the divisions between different parts of it. Comma (,), brackets ([]), parentheses (), dash (-), single and double quotation marks (' ', '"') are some of the punctuation marks.

► *Example 6:* What is the cerebral cortex?

They created an electronic circuit that mimics the biological circuitry of the cerebral cortex which is the brain's center of intelligence.

► *Example 7:* What does excessively mean?

UWB involves transmitting low-power streams of excessively short pulses- on the order of 10-1000 picoseconds.

appliance	وسيله
concentration	تمرکز
detergent	پاک کننده
Immediate	بلافاصله

Passage 3:

intractable	سرسخت-مشکل
cracking	شکستن
conundrum	معما
adaptive	سازگار
Impression	اثر
Surrounding	احاطه کننده
perception	درک
sought (seek)	جستجو کردن
replicate	کپی کردن
aspect	جنبه-منظر
objective	هدف
fusion	ترکیب
inspiration	الهام
environment	محیط
identify	شناسایی کردن
ripe	رسیده
explore	جستجو کردن
spike	جرقه زدن
phenomenon	پدیده
traditional	سنتی
faithful	باوفا
plasticity	حالت پلاستیکی
routes	مسیرها
resource	منبع

► Exercise 1 (IT 84)

When scaling a monitoring system to thousands of entities around a large network, you can find that network links become clogged just from the monitoring traffic. To solve this problem, some monitoring systems have remote probes that collect data and only send summaries back to the master station. If these are strategically placed around the network, they can greatly reduce the amount of network traffic generated. The master station stores the data and makes it available to the SAs. The master station also holds the master configuration and distributes that to the remote monitoring stations. This model scales much further than a single monitoring station or multiple unrelated monitoring stations .

1 _The word "clogged" is closest in meaning to

1) blocked

2) released

3) decreased

4) generated

► Exercise 2 (IT 83)

In the early days of computing, the computes were huge and could be operated only by a few trained people. Their size alone required that they be accommodated in a dedicated data center environment. Later, large mainframes had special cooling and power requirements and also had to live in a special data center environment, although they could be accessed over serial lines from more places. Mini-computers generated less heat and had lower power requirements. They were also housed in special computer rooms. Supercomputers generally needed water cooling, had special power requirements, and typically had to be housed in a data center with a specially reinforced raised floor. Early PCs generally were not used as servers but rather resided on people's desks without special power or cooling. PCs were the radical anti-mainframe tool, and their users prided themselves in being far from the data center. UNIX workstations were used as desktops and servers from the beginning, as are current PCs. Here the line between what should be in a data center versus what can be on, or under, a desk elsewhere in the building becomes less obvious and must be determined by function and customer access requirements, rather than by type of machine. We have come to a full circle: The PC world is now being required to build reliable, 24x7 systems, and they are learning to put their PCs in the data centers that they had previously rebelled against.

2 _The word "reinforced" is closest in meaning to.....

1) prepared

2) repeated

3) conducted

4) strengthened

► Exercise 3 (IT 84)

In the 1990's as organizations of scale began to need more timely data about their business, they found that traditional information systems technology was too cumbersome to provide relevant data efficiently and quickly. Completing reporting requests could take days or weeks using antiquated reporting tools that were designed more or less to "execute" the business rather than "run" the business.

3 _The word "cumbersome" is closest in meaning to.....

1) general

2) complex

3) analytic

4) inconvenient

navigate	هدایت کردن
diverse	متنوع
myriad	ده هزار

Passage 2:

manufacturing	ساختن
concept	مفهوم
synergistic	همکاری کننده
spirit	روح
combine	ترکیب کردن
multidisciplinary	چند رشته‌ای
shorten	کوتاه کردن
Intelligence	هوشمند
flexibility	قابلیت انعطاف
essential	ضروری
achieve	بدست آوردن
primary function	وظیفه اولیه
spatial integration	تجمع مکانی
accomplish	انجام دادن
displacement	جابجا کردن
Proximity	مجاورت - نزدیکی
constitute	تاسیس کردن
principle	اصل
inductive	سلفی
capacitive	خازنی
approaching	نزدیک شدن
orders of magnitude	حدود اندازه
demonstrate	نمایش دادن
practical	عملی
redundant	اضافی

► Exercise 4 (CE 85)

The Wrist PDA with Palm OS, from Fossil Inc., based in Richardson, Texas is a beauty at US \$250. Its screen may measure only 1.4 inches diagonally, but with 160 by 160 pixels, its resolution is the same as that of many full-size PDA screens. With 8MB of RAM and infrared and USB ports for syncing and charging, this watch is approximately equivalent in capability to a full-size PDA, such as the Palm IIIxe.

4 - In the first paragraph of the passage the word "syncing" stands for ...

- 1) synthesize 2) synchromesh 3) syncopation 4) synchronize

► Exercise 5 (IT 85)

More generally, the term data processing can apply to any process that converts data from one format to another, although data conversion would be the more logical and correct term. From this perspective, data processing becomes the process of converting information into data and also the converting of data back into information. The distinction is that conversion doesn't require a question (query) to be answered. For example, information in the form of a string of characters forming a sentence in English is converted or encoded from a keyboard's key-presses as represented by hardware-oriented integer codes into ASCII integer codes after which it may be more easily processed by a computer - not as merely raw, amorphous integer data, but as a meaningful character in a natural language's set of graphemes - and finally converted or decoded to be displayed as characters, represented by a font on the computer display. In that example we can see the stage-by-stage conversion of the presence of and then absence of electrical conductivity in the key-press and subsequent release at the keyboard from raw substantially-meaningless integer hardware-oriented data to evermore-meaningful information as the processing proceeds toward the human being.

5 - The word "integer" in the last paragraph is closest in meaning to

- 1) system 2) modification 3) whole number 4) combined data

► Exercise 6 (CE 84)

The resulting torrent of data will cascade into government and corporate data systems, the Internet. Facts and information that are largely incoherent but overwhelming in volume and detail will accumulate in databases too scattered and numerous - and valuable - to be shut off completely from the rest of cyberspace.

6 - What is meant by "cyberspace" as given on the last line of the passage?

- 1) Databases 2) The Internet
3) The information world 4) The cascading torrent of data

► Exercise 7 (IT 86)

At its most mature, IT portfolio management seeks to account for and direct the entire IT spend, including both innovative new capabilities (which are assessed on criteria such as potential ROI) as well as established systems (which may be assessed as to their contribution to corporate profitability, and also on

Important Vocabularies

Passage 1:

infrastructure networks	شبکه‌های زیرساختاری
transformative	قابل تغییر
economic growth	رشد اقتصادی
complicated	پیچیده
efforts	تلاشها
massive	بزرگ-حجم
centralized	مرکزی
shift	جابجایی
modular	قیاسی
scalable	قابل گسترش
lightweight	سبک
grid	شبکه
miniature plants	نیروگاه‌های مینیاتوری
component	جزء
capital- intensive networks	شبکه‌های کاملاً متمرکز
promise	نوید
disrupt	منقطع کردن
well-established	جا افتاده
solar-powered	کارکننده با انرژی خورشیدی
rural	روستایی
water purification system	سیستم تصفیه آب
infrastructure	زیرساختار
faith	ایمان
juice	عصاره
Meanwhile	در خلال
versatile	فراگیر
upgradable	قابل ارتقاء

non-financial criteria such as stability, usability, and technical obsolescence). It is distinct from IT financial management in which it has an explicitly directive, strategic goal in determining what to continue investing in versus what to divest. IT portfolio management as a systematic discipline is more applicable to the larger IT organizations; in smaller organizations, its concerns might be generalized into IT planning and governance as a whole.

7 - The word "divest" in the third paragraph best means

- 1) manage 2) pick out 3) take away 4) manufacture

► Exercise 8 (CE 79)

In a not too distant past, analog to digital (A/D) converters were realized by only a few highly specialized manufacturers worldwide for use as standard parts assembled in large hybrid and PCB modules. Today, the relentless trend of electronics integration and miniaturization is rapidly changing the way A/D converters are used, designed and even produced. Because such converters are being increasingly used as macro blocks embedded in to very large scale integration (VLSI) mixed-signal systems, their traditional label of "general purpose" components is quickly moving the way to "tailor-made" components that can optimally meet target specifications for performance, cost and energy consumption.

8 - Which phrase best explains the term "tailor-made"?

- 1) target-included 2) specification-driven
3) special-purpose 4) performance-optimized

9 - Which of the following best explain "hybrid"?

- 1) analog and digital 2) assembled and converted
3) embedded and quantized 4) integrated and miniaturized

► Exercise 9 (CE 78)

The unified modeling language (UML) is intended to consolidate the experience of the object-oriented (OO) community by providing a set of semantic modeling concepts and a corresponding notation that can provide a standard general-purpose modeling language for expressing most kinds of models. Its main advantage over other object-oriented analysis and design notation is the opportunity to end the petty wars over minor differences in semantics and notation by adopting a broad consensus developed by a number of methodologists and vendors. UML contains some newer features, but its core is based on years of experience with several of the leading OO methods. Yes, UML can be used on real projects today. UML is not a tiny language, but neither is C++, small talk, java or Eiffel. It needs to accommodate analysis and design, large and small projects, be compatible with many programming languages but depend on none. In particular, it needs to embrace the systems of today (they are no longer in the future) that are inherently concurrent, distributed and multilingual. We have made UML as simple as possible subject to these needs, but we don't expect someone to learn it in a day. We have structured the core concepts of UML to be straightforward; however, users of popular methods should learn enough in a day continue working productively in UML. We feel that UML is better defined than any other comparable modeling language. It has a self-referential meta-model (any general-purpose modeling language should be able to model itself) as well as a built in constraint language for defining non-synthetic restrictions. We have tried to strike a

phones is not radiation, but is rather the increased risk of driving accidents while using them. The results of several studies indicated that talking on a cell phone while driving significantly increases the risk of accidents, with some suggesting that it is almost as dangerous as driving while being drunk.

22 - The consensus of the scientific community for base stations is that there is:

- 1) A possible risk a brain cancer.
- 2) No risk at all.
- 3) No damage as long as people keep away from the site.
- 4) Damage as long as people keep away from the antennas.

23 - Some experts believe that:

- 1) Cancer due to EMR is not associated with cell phones.
- 2) Cancer due to EMR is not associated with low power.
- 3) Cancer due to EMR is associated with high power.
- 4) Cancer due to EMR is associated with medium power.

24 - It is impossible to prove health hazard from cell phones because:

- 1) Cell phone is a new technology.
- 2) Exposure is not safe.
- 3) Exposure is absolutely safe.
- 4) Of the absence of long-term research.

25 - What's a notable danger involving the use of cellular phones?

- 1) Driving.
- 2) Driving while being drunk
- 3) Driving while talking using a cell phone.
- 4) Radiation.

balance between formality and pragmatism. People will find flaws, of course; nothing of this size is ever perfect, but that is no different from most software products. We feel that the language is robust and can be repaired and extended easily, if the need arises.

- 10 _ The word "inherently" as used above is closest in meaning to which of the following?
 1) apparently 2) intrinsically 3) internally 4) interminably
-

► **Exercise 10 (EE 81)**

With thousands of functions and a manual large enough to be dangerous if it falls off a desk, Mathematica is a powerful math tool with steep learning-curve, well-suited for math gurus but likely to be overwhelming for ordinary mortals.

- 11 _ What may a "guru" be as mentioned in the above passage? Respected and influential....
 1) man 2) fellow 3) expert 4) analyst
-

► **Exercise 11 (EE 81)**

As in the real world, management tools and philosophies also tend to follow fade. Reengineering, and total quality management were all the rage 10 years ago. The most recent of which is the defect-eliminating strategy known as Six Sigma and the process management approach- called -Stage-Gate. As product cycle times shrink and competition heats up, management tools have proliferated widely, and senior managers are inundated with offers of books, seminars, and articles hyping the rewards of this or that method or technique.

- 12 _ According to the passage, what does the word "hyping" signify?
 1) presenting 2) resounding 3) announcing 4) exaggerating
-

► **Exercise 12 (EE 81)**

Two boxy, wheeled robots face off against each other. A whistle blows and they spring into action, jostling for possession of a brightly-colored golf ball on a playing field the size of a Ping-Pong table. Each team struggles to push the ball into the other team's goal located at the opposite end of the table. The robots move quickly, constantly adjusting to the run of play in a surprisingly lifelike way. Their anxious builders look on, unable to help because their offspring are completely autonomous.

- 13 _ What is the literal meaning of the word "offspring" and what does it refer to in the above passage?
 1) team, robots 2) robots, robots 3) children, robots 4) robots, builders
-

► **Exercise 13 (CE 79)**

As recently as eight years ago, computer viruses were considered an urban myth many. Today the situation is very different. As of November 1996, virus writers have programmed more than thirty thousand

reconfigure can be exploited, to some extent to mimic the plasticity of biological networks of neurons," says Professor McGinnity. This approach allows for flexibility, both in terms of rapid prototyping and the ease with which different neuron models can be implemented and test.

18 - What's the source of the data for SENSMaker?

- 1) Brain's neural system.
- 2) Capture sensory data from the scenery.
- 3) Capture sensory data from human sense.
- 4) Nature.

19 - To explore the aspects of biological perception by SENSMaker, first:

- 1) A model of human perception was developed.
- 2) Data from human senses were gathered.
- 3) Human brain system was studied.
- 4) Neural models for perception was sought to replicate aspects in silicon.

20 - Biological neurons signals are

- 1) short.
- 2) short and sudden.
- 3) spike or pulse.
- 4) 2 and 3.

21 - The main feature of the Field Programmer Data Array as the hardware of SENSMaker is:

- 1) Dynamically reconfigured.
- 2) Ease of operation.
- 3) Plasticity of biological networks.
- 4) Rapid hardware prototyping.

Passage 4

Electro Magnetic Radiation (EMR) from cellular cordless and hand-held radios have billions of timeless energy to cause ionization or damage to DNA contained in human tissue. The rapid and widespread use of this technology, however, has raised concern over possible adverse health effects, in particular brain cancer. Several studies which addressed this concern have been conducted in a few countries. These studies seem to rule out, with a reasonable level of confidence, any association between EMR from these devices and cancer.

A growing number of scientific experts have shifted positions regarding the use of these types of wireless devices. Many of these experts believe that cancer is a risk associated with EMR in the higher wattage ranges. For base stations located at radio sites, the consensus of the scientific community is that the power produced is far too low to cause health hazard so long as people are not being held in close proximity to the antennas.

It is important to note that cellular and cordless telephones are relatively new technologies, and it is impossible to prove that any product or exposure is absolutely safe in the absence of long-term research. So, a good precautionary approach would be for adults to keep cell phone conversations short and to discourage frequent, extended use of cell phones by children. A notable danger involving the use of cellular

computer viruses. The "improvements" can be at least partially attributed to the efforts of antivirus producers.

As antivirus products improve and detect the latest and greatest viruses, the virus authors invent new and more devious ways to hide their progeny. This co-evolution has led to the creation of the most complex class of virus to date: the polymorphic computer virus. These cunning viruses simply cannot be detected cost-effectively using traditional antivirus scanning algorithms. Fortunately the antivirus producers have responded; as they have in the past, with an equally creative solution to the polymorphic have virus threat. Many antivirus programs are now starting to employ a technique known as generic decryption to detect even the most complex polymorphic viruses quickly and cost-effectively.

14 _ What does the author of this passage mean by the term "co-evolution"?

- 1) improvement of both virus and antivirus techniques
- 2) evolution of virus design methods
- 3) using generic decryption to detect viruses
- 4) all of the above

► Exercise 14 (CE 81)

Forced to grapple with increasingly ubiquitous and powerful information technologies, policy makers and leaders in developing countries have over the past few years been frantically seeking ways and means to shore up the very spare infrastructure base in those countries. Wireless networks are often cited as the most economically feasible solution to the severe dearth of infrastructure in these nations. For the foreseeable future, the development of wireless networks is indeed the optimal solution to the information infrastructure gap in developing countries. Many developing nations have embarked on this road and a loose formula of employing fixed cellular networks for local loops, the proverbial "last mile" in the communications network systems, and satellite transmission for long distance and international communications has emerged.

15 _ What is the "last mile" of communication networks?

- | | |
|----------------------|----------------------------|
| 1) satellites | 2) local loops |
| 3) wireless networks | 4) fixed cellular networks |

► Exercise 15 (IT 83)

Even with traditional file environments, techniques using the database style for organizing data can be applied to produce similar benefits. The process of normalizing files to produce redundancy, eliminating the need for variable length records, and permitting access through primary keys, can produce systems that emulate database environment. Although processing in efficiencies may result for any particular application, the whole system efficiency will be enhanced. The integrity of the data will improve and adaptability of the system to future needs will increase. Generally, the collection of data managed by an organization remains fairly stable. Applications that process the data, however, change and expand. If a system design, especially its file structure, is needed after those applications, a change in processing requirements will dictate a change in the file structure. If, on the other hand, a system design is anchored to

16 _ Which of the following has helped develop microsensors on extremely small scales?

- 1) Advances made in the manufacturing of silicon chips.
- 2) Combination of microsensors and multisensors and multisensor fusion.
- 3) Use of signal-processing electronic in sensing devices.
- 4) Use of intelligence and flexibility in sensor technology.

17 _ The operation of sensors discussed in this paper is mainly based on:

- 1) Ferromagnetic, resistive and signal processing principles.
- 2) Inductive, capacitive, and photoelectric principles.
- 3) Principles imitating human senses.
- 4) Proximity distance measurement.

Passage 3

Teaching a machine to sense its environment is one of the most intractable problems of computer science but one European project is looking to nature for help in cracking the conundrum. It combined streams of sensory data to produce an adaptive, composite impression of surroundings in near real-time. It looked at basic neural models for perception and then sought to replicate aspects of these in silicon. It is said that the objective was to study sensory fusion in biological system and then translate that knowledge into the creation of intelligent computational machines. SENSEMAKER took its inspiration from nature by trying to replicate aspects of the brain's neural processes, which capture sensory data from eyes, ears and touch, and then combine these senses to present a whole picture of the scene or its environment. For example, sight can identify a kiwi, but touch can help tell if that kiwi is ripe, unripe or over-ripe. To explore these aspects of biological perception SENSEMAKER first developed a model of human perception, based on the best available data from the biological and neurological sciences.

Biological neurons use short and sudden increases in voltage to send information. These signals are more commonly known as action potentials, spikes or pulses. Computer science calls the phenomenon Spiking Neural Networks. More traditional or classical artificial neural networks use a simpler model. The traditional model of an artificial neural network is quite removed from biological neurons, while the spiking neural networks we used are more faithful to what happens in the real biological brain," says Professor McGinnity. Similarly, adaptation is another aspect of the biological model, known as plasticity, where data flows through new routes in the brain to add further resources to data capture. If repeated over time, this plasticity becomes learning, where well-traveled routes through the brain become established and reinforce the information that passes.

As the model was being established, the team developed hardware demonstrators to implement and test components of the overall sensory fusion system. One project partner focused on implementations based on classical traditional neural networks _ essentially large arrays of simple threshold devices. In parallel another group used Field Programmable Gate Arrays to implement large arrays of spiking neural networks for emulation of a number of components of the sensory system, particularly the visual processing element. "Field Programmable Gate Arrays are hardware computing platforms that can be dynamically reconfigured and as such, are ideal for exploring artificial representations of biological neurons, since their ability to

the data structure rather than to the processing structure, the impact of changes is reduced. Files organized according to business needs rather than to computer processing needs serve long-term organizational goals as well as immediate data processing objectives .

Thus, determination of file organization methods should be predicted by careful modeling of the data . This modeling in turn, should borrow from schema development techniques that are applied in database environments. The result will be a file structure that is generally applicable to both the current processing environment and to planned changes and contingencies.

16 _ The word "redundancy" is closest in meaning to.....

- 1) obsolescence 2) out-of-date 3) more than enough 4) no longer in use

17 _ The word "emulate" is closest in meaning to

- 1) give 2) imitate 3) take 4) provide

18 _ The word "enhanced" is closest in meaning to

- 1) intensified 2) followed 3) entered 4) degraded

► Exercise 16 (IT 83)

When the PC was first introduced, service and support requirements were far simpler. The machines didn't move around, were often hard-wired to the desk and were only used at the business location that owned them. That started changing in the early 90s, and now the workplace is essentially anywhere the employee is located. This puts new pressures and strains on service requirements.

IT service and support now must deal with an employee who may be in five different cities in four days to fix a broken notebook. Then there's the problem of telecommuters that need to get service and support, but aren't sitting in a corporate office where support can come from down the hall. And of course, most white-collar employees are pretty much non-productive if they have no access to the network. We've become dependent on technology to such extent that in some offices, if the systems are down, and for more than an hour or so, employees are actually allowed to go home.

19 _ Who are the "telecommuters", as stated in the second paragraph of the passage? People who...

- 1) are working a far distance from their office 2) work as sales representatives
3) are always on the move 4) work in an office

20 _ What do "white-collar employees" mean?

- 1) Salesmen 2) Factory workers
3) Office employees 4) Telecommuters

14 - According to the passage, at the present time, how has the Voice over Internet Protocol transformed our communication systems?

- 1) It has dominated the business models of telephony.
- 2) It has interfered with the business models of telephony.
- 3) It has divulged the business models of telephony.
- 4) It has disregarded the business models of telephony.

Passage 2

Mechatronics draws heavily on the concepts of synergistic integration of mechanical engineering with electronics, computers and control in the design and manufacturing of products and processes. The key spirit of mechatronic products is to add intelligent components and systems which combine an optimum use of multidisciplinary technologies to shorten the development cycle with reduced cost and increased quality. Intelligence and flexibility are essential in a mechatronic product. To achieve the primary function of an integrated system, it is essential that the functional interaction and spatial integration between mechanical, electronic, control and information technologies be accomplished in a synergistic way. Sensor technologies are as important in the mechatronic system as the senses are to the human being. It has been estimated that 80% of all measurements made in industry are of displacement nature. Proximity distance measurement constitutes the largest group of measurements made in science and technology. Therefore, this paper focuses on the discussion on proximity sensor with different physical sensing principles such as inductive, capacitive, photoelectric, ultrasonic, linear variable differential transformer, etc., including sensors which are useful in mechatronic systems such as silicon sensors, fiber-optic sensors, force/torque sensors and load cells. Furthermore, advances in the manufacturing of silicon chips which are able to integrate sensing devices and signal-processing electronics have opened the world to the development of microsensors on a scale approaching three orders of magnitude smaller than the diameter of a human hair. A combination of microsensors and multisensors and multisensor fusion will make possible a new range of applications. Continuing developments in microsensor technology demonstrate that it may soon be practical to consider using very dense populations of highly redundant sensors in mechatronic products in much the same way that they appear in biological systems. A modern appliance is an example of a mechatronic product. A washing machine requires a number of sensors, about 10 or more, to detect the level of water, the type of materials to be washed, the degree of dirt, the concentration of detergent, etc., so that it can provide the required immediate feedback for reliable, flexible operation.

15 - What are the essential ingredients of mechatronic products?

- 1) Combination of inductive, capacitive, photoelectric and ultrasonic sensors.
- 2) Intelligence and flexibility.
- 3) Proximity sensing and distance measurements.
- 4) Sensors similar to those in the human body.

Lesson 9

References

In the exam you may also get questions on *reference*. These questions can take certain words from the passage (such as "this", "that", "it", "him", "her", "them", "the problem", "the question" etc.) and ask you what they refer to. The reference could be to something which has already been mentioned or to something which is going to be mentioned.

► **Read the following paragraph and answer its corresponding questions.**

Eight basic practices have been found to be characteristics of successfully managed companies. One of these is management's "bias toward action"; this was manifest in a willingness to experiment and take risks. In such a company all new ideas get tested and then get stored rather than discarded if they don't work right away.

Long, detailed strategies are not the rule, and ideas are solicited from everyone, not just from corporate planners.

Many of these ideas are considered part of the management's conventional wisdom in highly profitable Japanese corporations but few of them are common practice in the majority of American business concerns, many of which do not realize the New Law of Business Life: that strong cultures make for highly successful companies.

► *Example 1:* What does the word "these" in line 2 refer to?

- 1) Basic practices.
- 2) Successfully managed companies.
- 3) New ideas.
- 4) Different styles of management.

15-

1) as

2) to

3) or

4) for

Part C: Reading Comprehension**Passage 1**

During the 20th century, infrastructure networks were the most transformative technology for industrial nations and a powerful engine for economic growth. They were also the most complicated and expensive efforts of the time. In the next 50 years, new materials and information technologies will enable a shift from massive, centralized infrastructure networks to modular, scalable, lightweight grids.

MEMS will shift the scale of materials processing, perhaps making possible home-based miniature plants to generate power, process waste, and purify water. The components will be organized more efficiently, more flexibly, and more securely than the capital-intensive networks of the 20th century.

Already today, Voice over Internet Protocol, or VoIP, communication promises to disrupt the well-established players and business models of telephony. And in the developing world, solar-powered Wi-Fi network hubs and ultralow-cost laptop computers are starting to bring the information age to rural communities. Also, in poorer regions, carbon nanotube filters are enabling the creation of portable personal water purification systems, about the size of a roll of paper towels that do not require electricity.

And that's just the beginning of the new, light infrastructure. Today, flipping on a light switch is an act of faith in the central utilities that serve our cities. They sell, we buy. However, distributed power systems could lead to energy markets where any of us can deal in juice.

Whatever our future sources of energy might be, expect energy-efficient devices to be in wide use. This includes light-emitting diodes (LEDs) instead of incandescent lightbulbs in home lighting and much more efficient photovoltaics, made possible by advances in nanoscience and nanoengineering.

Meanwhile, software-defined radio will transform our communications systems, making them highly versatile, dynamic, and easily upgradable. Ideally, a single device would be able to navigate the wireless world's diverse networks with their myriad protocols. Software-defined radios do this by using software instead of hardware to modulate radio signals.

11 - Which of the following adjectives can best suit MEMS?

1) Efficient.

2) Flexible.

3) Miniature.

4) None of the above.

12 - In what way does life undergo changes within 50 years from now considering the technological developments stated in the above passage?

1) Life will be less monopolized and more decentralized.

2) Life will be less complicated and more organized.

3) Life will be less expensive and more outgoing.

4) Life will be far more convenient.

13 - What is meant by a software-defined radio?

1) Software is used instead of hardware for modulating radio signals.

2) Software that navigates diverse networks and upgrades its environment.

3) Software is used for upgrading the communications system.

4) All of the above.

► *Example 2:* What does the word "this" in line 2 refer to?

- 1) The action of management.
- 2) A bias toward action.
- 3) A willingness to experiment.
- 4) Evidence of risk-taking.

► *Example 3:* What do the words "such a company" in line 3 refer to?

- 1) One that is successful.
- 2) One that plans ahead.
- 3) One that takes risks.
- 4) One that likes long, detailed strategies.

► *Example 4:* What do the words "these ideas" in line 7 refer to?

- 1) Basic practices.
- 2) Strong cultures.
- 3) Careful strategies.
- 4) Ideas suggested by all employees.

► *Example 5:* What does the word "them" in line 8 refer to?

- 1) Conventional methods.
- 2) Japanese companies.
- 3) These ideas.
- 4) Business concerns.

► *Example 6:* What does the word "which" in line 9 refer to?

- 1) Profitable Japanese corporations.
- 2) Common business practices.
- 3) American business concerns.
- 4) New Laws of Business Life.



References are very important in technical passages. Whenever you encounter a reference, you should find its corresponding word even though you are not asked to find it. Otherwise, you will not be able to understand the passage's point.

► *Exercise 1 (IT 84)*

When scaling a monitoring system to thousands of entities around a large network, you can find that network links become clogged just from the monitoring traffic. To solve this problem, some monitoring systems have remote probes that collect data and only send summaries back to the master station. If these are strategically placed around the network, they can greatly reduce the amount of network traffic generated. The master station stores the data and makes it available to the SAs. The master station also

EE 87

1 _ Copies of the documents are available for ----- at local libraries.
1) inspection 2) simulation 3) attribution 4) constitution

2 _ It is perhaps ----- that advanced technology will increase the pressure on workers.
1) eventual 2) inherent 3) potential 4) inevitable

3 _ The finance director has announced that ----- on spending have forced the company to rethink its plans.
1) variables 2) implications 3) constraints 4) procedures

4 _ Certain forms of mental illness be ----- by food allergies.
1) founded 2) triggered 3) assigned 4) disregarded

5 _ Under mandatory sentencing, the court has no authority to ----- the prison term.
1) release 2) modify 3) diminish 4) interact

6 _ In some areas, floodwaters caused ----- damage and a great loss of life.
1) empirical 2) persistent 3) successive 4) widespread

7 _ Offered the position of chairman, Smith -----, preferring to keep his current job.
1) resolved 2) declined 3) conceived 4) encountered

8 _ She holds the ----- of having been the first woman editor of the Harvard Law Review.
1) coherence 2) distinction 3) inclination 4) complement

9 _ Studies have shown that insect populations ----- wildly from year to year.
1) convert 2) maintain 3) fluctuate 4) distribute

10 _ With so little money available, repairs must remain a low ----.
1) priority 2) application 3) incentive 4) adjustment

If you ask most people to list what makes them (11) ----- someone on first meeting, they (12) ----- personality, intelligence, and sense of humor. But they're probably deceiving (13) ----- . The characteristic that impresses people the most (14) ----- meeting anyone, from a job applicant (15) ----- --- a classmate, is appearance.

12-	1) like	2) to like	3) being liked	4) liking
13-	1) will say	2) are to say	3) are saying	4) will be saying
14-	1) it	2) them	3) themselves	4) one another
	1) is	2) for	3) when	4) during

holds the master configuration and distributes that to the remote monitoring stations. This model scales much further than a single monitoring station or multiple unrelated monitoring stations.

Real-time monitoring systems also have scaling problems. When such a system is watching many aspects of many devices, there will always be some things that are "red," indicating some form of outage requiring attention. To scale the system appropriately, the SAs must be able to tell at a glance which of the "red" issues is the "reddest" and having the most impact. Essentially, the problem is that a monitoring system typically only has a few states to indicate the condition of the monitored item. Often there are only three: "green," "yellow," and "red." Monitoring many things requires a finer granularity. For example, a very granular priority system could be built in, and the reporting system could display the problems in a priority-ordered list.

1 - The word "these" refers to.....

- | | |
|------------------|-----------------------|
| 1) stations | 2) summaries |
| 3) remote probes | 4) monitoring systems |

► Exercise 2 (IT 85)

Most definitions of information security tend to focus, sometimes exclusively, on specific usages and, or, particular media; e.g., "protect electronic data from unauthorized use." In fact it is a common misconception, or misunderstanding, that information security is synonymous with computer security in any of its guises: computer and network security, information technology (IT) security, information systems security, information and communications technology (ICT) security. Each of these has a different emphasis, but the common concern is the security of information in some form (electronic in these cases): hence, all are subsets of information security. Conversely, information security covers not just information but all infrastructures that facilitate its use processes, systems, services, technology, etc., including computers, voice and data networks, etc.

2 - The word "all" in the third paragraph refers to....

- | | |
|--|---|
| 1) guises of security | 2) cases of electronic data |
| 3) definitions of information security | 4) computer security and network security |



In addition to simple pronouns which you are familiar with them, English has other pronouns such as **latter** and **former**. They refer to words in the previous sentence which should include only two words.

► Exercise 3 (EE 82)

The low voltage installation in a building is basically an extension of public supply and distribution network. The latter is the responsibility of the 'supply authority' which for operational reasons will impose certain technical constraints on the design and operation of the former.

3 - What does "latter" refer to? (author)

- | | | | |
|-----------------------------|------------------|-------------------------|------------|
| 1) low voltage installation | 2) public supply | 3) distribution network | 4) 2 and 3 |
|-----------------------------|------------------|-------------------------|------------|

inconvenient	ناراحت
deal with	سروکار داشتن با
waste	هدر دادن
financial transactions	معاملات تجاری
achieve	بدست آوردن
maintenance	نگهداری
Furthermore	بعلاوه
component	جزء
scheme	طرح
Besides	بعلاوه
requirement	مایحتاج
complicated	پیچیده
tariff	تعرفه
structural	ساختاری
framework	بستر-چهارچوب
scalability	مقیاس پذیری
Flexibility	قابلیت انعطاف
stability	پایداری
usability	قابلیت استفاده
concern	موضوع مهم
concentrate	متمرکز شدن
provision	تهیه و تدارک دیدن
environment	محیط
adaptable	سازگار
capabilities	امکانات
regardless	صرفنظر
literature	تاریخچه
infrastructure	زیرساختار
assign	تخصیص دادن
unique identifier	شناسه منحصر بفرد
agent	عامل



Definite article **the** can be used before any noun when both the speaker and listener have a specific thing or person in mind. In the other words, a noun with the definite article should be stated in the previous sentences.

► *Exercise 4 (CE 80)*

While reading about the future of the wireless telephone, I recalled some controversy over this system. There is no doubt that wireless telephone benefit our society. The industry's approach to installing antennas wherever it wishes, however, over the objections of local communities, does not benefit our society.

4 _ Who the author blames for the negative impacts of wireless telephone?

- | | |
|---|--|
| 1) wireless industry as a whole | 2) companies that make antenna |
| 3) poor engineer and technology direction | 4) local communities and city administration |

► *Exercise 5 (IT 86)*

IT portfolio management is the application of systematic management to large classes of items managed by enterprise information technology (IT) capabilities. IT portfolios do not always focus on items that can be financially measured. Examples would be planned initiatives, projects, and ongoing IT services (e.g., application support). The promise of IT portfolio management is the quantification of previously mysterious IT efforts, enabling measurement and objective evaluation of investment scenarios. IT portfolio management started with a project-centric bias, but is evolving to include steady-state portfolio entries such as application maintenance and support, which consume the bulk of IT spending. The challenge for including application maintenance and support in portfolios is that IT budgets tend not to track these efforts at a sufficient level of granularity for effective financial tracking.

The concept is analogous to financial portfolio management, but there are significant differences between the two. IT investments are not liquid like stocks and bonds, and require both financial and non-financial measures (e.g., a balanced scorecard approach) to evaluate; a purely financial view is not sufficient. Financial portfolio assets typically have consistent measurement information (enabling accurate and objective comparisons), and this is at the base of the concept's usefulness in application to IT. However, achieving such universality of measurement is going to take considerable effort in the IT industry.

5 _ The phrase "the two" in the second paragraph refers to...

- 1) application maintenance and support
- 2) different types of IT management
- 3) financial and IT portfolio management
- 4) the two concepts of financial portfolio management

hostility	دشمنی
demonstrate	نمایش دادن
admit defeat	قبول شکست
obstacle	مانع

Passage 7:

surgery	جراحی
habitat	محل سکونت

Passage 8:

request	خواهش کردن
Despite	باوجود
delay	تاخیر
simulate	شبیه سازی
suturing	بخیه کردن
vein	رگ
latex anatomical model	مدل پلاستیکی آناتومی
influential	بانفوذ
encourage	تشویق کردن
perform	انجام دادن
patient	بیمار
gallbladder removal procedure	عمل خارج کردن کیسه صفرا
dedicated	پیشیده
litigation	دادخواهی
merger	ادغام
approved	تایید شده
cardiac procedure	عمل قلب
customer	مشتری
billing and accounting scheme	طرح صدور قبض
flat rate	نرخ ثابت
varieties	تنوع
comprehensive	جامع
subscribe	پذیره نویسی کردن
service provider	سرویس دهنده

► Exercise 6 (IT 86)

The discipline of information technology governance derives from corporate governance and deals primarily with the connection between business focus and IT management of an organization. It highlights the importance of IT-related matters in contemporary organizations and states that strategic IT decisions should be owned by the corporate board, rather than by the chief information officer or other IT managers. The primary goals for information technology governance are to assure that the investments in IT generate business value and to mitigate the risks that are associated with IT. This can be done by implementing an organizational structure with well-defined roles for the responsibility of information, business processes, applications, infrastructure, etc. Decision rights are a key concern of IT governance, being the primary topic of the book by that name by Weill and Ross. According to Weill and Ross, depending on the size, business scope, and IT maturity of an organization, either centralized, decentralized, or federated models of responsibility for dealing with strategic IT matters are suggested. In this view, the well defined control of IT is the key to success. After the widely reported collapse of Enron in 2000, and the alleged problems within Arthur Andersen and WorldCom, the duties and responsibilities of the boards of directors for public and privately held corporations were questioned. As a response to this, and to attempt to prevent similar problems from happening again, the US Sarbanes-Oxley Act was written to stress the importance of business control and auditing. Sarbanes-Oxley and Basel-II in Europe have been catalysts for the development of the discipline of information technology governance since the early 2000s. However, the concerns of Sarbanes Oxley (in particular, Section 404) have less to do with IT decision rights as discussed by Weill and Ross, and more to do with operational control processes such as change management.

6 -By "It" in the first paragraph, the author means.....

- 1) organization
- 3) management

- 2) IT governance
- 4) corporate governance

► Exercise 7 (EE 85)

Most current commercial packages for harmonic analysis use a direct solution method whereby a harmonic current source, specified in advance, is injected into the linear network to determine the voltage and current distortion levels. This approach provides realistic frequency domain models of the linear ac system. However, a harmonic current source is usually an oversimplified model of the non-linear plant. The overall solution for twelve pulse converter test system depends not only on the system voltage source, current source and impedances, but on converter variables such as controller characteristics, firing angle constraints, etc. Iterative techniques are thus necessary to solve all these variables together to reach a final correct solution. In the harmonic models of ac-dc system available in the literature, the emphasis is on the solution technique, with a clear trend towards the Newton method. In comparison, the question of model accuracy has been given very little attention and some early models are still superior to those recently described .

dynamic equilibrium	تبادل دینامیکی
disappear	ناپدید شدن
consequently	در نتیجه
reduce	کاهش یافتن

Passage 6:

iteration	تکرار
concept	مفهوم
ultra wideband radio	رادیوی طیف گسترده
expanse	پهنا
vast	وسیع
radio spectrum	طیف رادیویی
Traditional radio	رادیو سنتی
authority	اجازه
regulate	تنظیم کردن
consistently	بطور موافق
rule	قانون گذاری
commerce	تجارت
claim	ادعا
jurisdiction	صلاحیت قانونی
minuscule	کوچک
restrict	محدود کردن
broadcaster	پخش کننده
licensed	دارای مجوز
encryption	کد گذاری - رمزنگاری
allowed	اجازه داشتن
In contrast	برعکس
concern	موضوع مهم
coalition	ائتلاف
demand	تقاضا
mandatory	اجباری
enforce	مجبور کردن
preposterous	نامعقول

Under realistic conditions, the switching instant of the bridge valves are not equispaced over one cycle due to converter action. The incorporation of switching angle modulation in the converter model permits an accurate derivation of the individual switching instants; their effect on transfers between the ac and dc system must be quantified, and all causes influencing the modulation must be accounted for. An early cause of firing angle modulation was the use of individual firing control.

7 - Which techniques are important to solve variables such as controller characteristics and firing angle constraints?

- | | |
|----------------------|-------------------------|
| 1) Direct solution | 2) Newton's method |
| 3) Indirect solution | 4) Iterative techniques |

► Exercise 8 (EE 84)

Relays are supposed to protect the power system from those conditions that we consider to be undesirable. These conditions may be harmful to the power apparatus - such as a line, a transformer, or a bus - but, more often, the potential is for harm to the power system. It is the system that may go unstable, split up, and cause a blackout. It is to prevent these happenings that the relays must act quickly and accurately. And this, in fact, is the central dilemma of relaying: how to be quick and accurate at the same time. If you can be slow, you can think things over and be more accurate. Quickness of action is an invitation to make mistakes. So, relays will make mistakes. They can err on the side of being too cautious: the relays will fail to trip when they should have - in the relaying jargon, this is failure of dependability. Or they err on the other side: they will trip when they should not have - again, in the jargon, this is a loss of security. Both errors are bad, but we have to accept both. The relay designer strikes a balance between the two errors, and depending upon what the protection engineer did with his balancing act, the system will be prone to over-tripping, thus bringing the power system down - or it will fail to trip soon enough and may bring the system down anyway. It is a tough balancing act.

8 - Relays must act quickly and accurately

- 1) to set up undesirable conditions in a power system
- 2) to harm the power apparatus under transient conditions
- 3) to prevent the power system from becoming unstable
- 4) to eliminate lines, transformers, and buses from a power system

► Exercise 9 (EE 86)

Face recognition technology that could revolutionize security systems worldwide has been developed by computer scientists at Sheffield Hallam University. The new specialist software can produce an exact 3D image of a face within 40 milliseconds. Other 3D systems that have been trailed have proved unworkable because of the time it takes to construct a picture and an inaccurate result. The groundbreaking invention, by experts in the University's Materials and Engineering Research Institute (MERI), was tested by Home Secretary Charles Clarke on a recent visit to Sheffield. It could be used for tighter security in airports, banks, and government buildings and ID cards.

Passage 4:

recognition	شناسایی
security systems	سیستمهای حفاظتی
worldwide	جهانی
specialist software	نرم افزارهای خاص
trail	پیشرو
unworkable	ناکارآمد
construct	ساختن
inaccurate result	نتایج غلط
ground-breaking invention	نوآوری عظیم
government	دولت
identity	شناسایی
Biometric features	ویژگیهای بیومتریک
extract	استخراج کردن
heightened security	ایمنی زیاد
private	خصوصی
pose	حالت
criminal	جنایی
viable	ارزشمند

Passage 5:

ionization	یونیزاسیون
radiation	تشعشع
strike	برخورد کردن
intensity	شدت
altitude	ارتفاع
thin	نازک
denser	چگالتر
ultra violet light	نور مافوق بنفش
recombine	بازترکیب
afterwards	سپس
affair	کار- امر

The breakthrough comes days after members of parliament (MPs) backed the compromise plans for identity cards, meaning from 2008 people applying for a new passport will also get an identity card, with their biometric details stored on a central register. The new technology works by projecting a pattern of light onto the face, creating a 2D image, from which 3D data is generated. Biometric features are extracted by a "parameterization" process, giving a digital mapping of a face that would form part of a fool-proof security system.

It is said that, this technology could be used wherever there is a need for heightened security. It is well suited to a range of applications including person identification from national databases, access control to public and private locations, matching 3D poses to 2D photographs in criminal cases, and 3D facial biometric data for smart cards such as ID and bank cards. We have developed a viable, working system at the cutting edge of 3D technology.

9 _ In the new technology discussed in the passage, 3D data is generated from

- | | |
|-----------------------|--------------------|
| 1) 2D image | 2) light patterns |
| 3) biometric features | 4) digital mapping |

Passage 3:

extremely	بشدت
primarily	اولیه
excellent	عالی
material	ماده
attractive	جذاب
electrically-driven motor	موتور الکتریکی
strength-to-weight ratio	نسبت وزن به نیرو
manufacturing	ساخت
diverse	متنوع
category	دسته
military product	محصول نظامی
suspension system	سیستم ترمز
pervasive	فراگیر
actuator	محرك
unreliable	غیر قابل اطمینان
substrate	زیر لایه
fabricate	ساخت
sequence	سکانس
compatible	سازگار
selectively	گزینشی
etch	زدودن
wafer	قطعه نازک سیلیکون که مدار مجتمع روی آن ساخته می شود
batch fabrication	ساخت دسته جمعی
revolutionize	انقلابی کردن
smart products	محصولات هوشمند
augment	تقویت کردن
perception	ادراک

Lesson 10

Multiple Choice Strategies

5- XXX XXXX XXX XXXX XXX XXXX ?
✗ 1) XXX XXXX
✗ 2) XXX XXXX
? 3) XXX XXXX
✓ 4) XXX XXXX



In the exam all the questions are in a multiple choice format. They all follow the same principle, the same idea, that there is one question (or a statement or an incomplete statement) and four “answers”, only one of which is correct.

► Example:?

- 1) Incorrect
- 2) Correct
- 3) Incorrect
- 4) Incorrect



Of the four answers often one is “nearly” correct. In other words, it can distract you; it can draw your attention away from the correct answer, more easily than the other two incorrect answers.

Passage 2:

require	لازم داشتن
sophisticated	پیچیده
flexibility	قابلیت انعطاف
points of view	دیدگاه
feature	ویژگی
consider	ملاحظه کردن
luxury	لوکس
requirement	نیازها
integration	تجمع
relevant	مرتبط
aspect	جنبه - وجه
emphasize	تاکید کردن
demand	تقاضا
challenging	چالش برانگیز
involve	شامل
exhibit	نمایش دادن
significant	قابل ملاحظه
disturbance	اختلال - پارازیت
bearing system	سیستم یاطاقان
Analytical	تحلیلی
description	توصیف
fundamental concepts	مفاهیم پایه‌ای
applicable	قابل اجرا
specification	تعیین
imply	اشاره داشتن به

► *Example:*?

- 1) Nearly correct
- 2) Incorrect
- 3) Correct
- 4) Incorrect

What can incorrect answers have in common? Often they can contain words from the passage or the question which have been mixed up. Or they can contain certain ideas from the passage which have been wrongly put together. The “nearly correct” answer can be quite close to being correct, but it fails for any of a number of reasons:

- (i) It may be too general or too vague.
- (ii) It may be true of the passage but slightly irrelevant to the question.
- (iii) It may be true but not according to the context of the passage.

► *Example:* Consider the following passage. Notice to the multiple choice strategies mentioned before and try to answer its corresponding questions.

Bananas are widely believed to grow on trees: this is incorrect. The banana is a plant which finishes all its growth in one year, reaching a height of 30 feet. Bananas have a subterranean stem from which come large, green leaves. The plant reaches its maturity in about 18 months.

As the bunches of bananas mature and the fruit develops, they can be propped up with poles and covered with blue polyethylene bags. These prevent bruising, protect against the frost, and speed ripening by increasing heat and humidity.

Once the banana plant has produced its fruit, the mother plant dies and is replaced by pups (sucker plants). These grow next to the parent and make a new generation of banana plants.

► *Reference*

What does the word “this” in line 1 refer to?

- 1) The belief that bananas grow on trees.
- 2) Certain beliefs about bananas.
- 3) Widely-held beliefs about banana trees.
- 4) The belief that bananas do not grow on trees.

► *Answer:*

✓ 1) Correct.

? 2) “Close” but incorrect. “This” refers to only one specific belief about bananas, namely, that they grow on trees.

✗ 3) Incorrect. “This” refers to only one belief about bananas, not banana trees. The word “widely-held” is also misleading.

✗ 4) Incorrect. The belief (an incorrect one) is that bananas do grow on trees.

Important Vocabularies

Passage 1:

autonomous	مستقل - خود مختار
govern	کنترل کردن
environment	محیط
determine	تعیین کردن
knowledge	دانش
release	آزاد کردن
adapt	وفق دادن
explicitly	بطور آشکار
in advance	از پیش
entity	موجودیت
modify	تغییر دادن
ability	توانایی
respond	پاسخ دادن
local	محلی
individual	منحصر بر فرد
Worth noting	قابل ذکر
randomness	تصادفی
despite	با وجود
presence	حضور
explore	کاوش کردن
uncharted territory	قلمرو کشف نشده
evidence	مدرک - دلیل
conflict	تضاد
suggestion	پیشنهاد
avoid	اجتناب کردن
local optima	بهینه محلی
roam	گشتن
constantly	دائما

► *Main Idea*

What would be the best title for the first paragraph?

- 1) Beliefs about banana plants.
- 2) The growth of a banana plant to maturity.
- 3) A year in the life of a banana plant.
- 4) Banana plants: from birth to maturity.

► *Answer:*

✗ 1) Incorrect. Only the first sentence refers to beliefs about banana plants

✓ 2) Correct.

✗ 3) Incorrect. The paragraph looks at a year and a half in the life of a banana plant. This answer is also vague.

? 4) "Close" but incorrect. This is vague and the "birth" of the banana plant is not mentioned here.

► *Scanning*

Why are blue polyethylene bags mentioned in paragraph 2?

- 1) They are used to prop up bananas.
- 2) They protect growing bananas and speed ripening.
- 3) They help increase heat and humidity and so prevent bruising.
- 4) Bunches of bananas are always covered with them.

► *Answer:*

✗ 1) Incorrect. It is poles which are used for this.

✓ 2) Correct.

✗ 3) Incorrect. They do help increase heat and humidity but these two factors do not prevent bruising.

? 4) "Close" but incorrect. Bunches of bananas may be covered with these bags. "Always" is wrong.

► *Skimming- General idea*

What is the main idea of the last paragraph?

- 1) How the banana plant produces its fruit.
- 2) How a sucker plant is called a pup.
- 3) The death of mother plants.
- 4) The growth of sucker plants.

► *Answer:*

✗ 1) Incorrect. "Fruit" is only mentioned in the first sentence of the paragraph; and there is nothing about how fruit is produced.

✗ 2) Incorrect. Pup is the name given to a sucker plant; but no other information about this name was given in the paragraph.

? 3) "Close" but incorrect. The death of the mother plant is referred to but it is the growth of the sucker plants which is more important; both the sentences refer to this growth.

✓ 4) Correct.

user also belongs to a home network that has servers with the updated user profile (including the current location of the user's agents, user's preferences, and currently used device descriptions). When the user moves from his/her home network to a visiting network, his/her agents will migrate to the new network. When somebody makes a call request to a user, say Mary, the caller's agent first locates Mary's agent by making a location request to her home network. By looking up Mary's profile, her home network sends back the location of Mary's agent to the caller's agent. Once the caller's agent identifies Mary's location, the caller's agent can directly communicate with her agent. Different agents may be used for different services. A mobile agent-based infrastructure uses four assistants (user assistant, HTTP assistant, mail assistant, and FTP assistant) to personalize user operating environments. However, there are other personal mobility frameworks that do not rely on mobile agents.

23 - Which choice is closer to the passage?

- 1) Agents in a mobile agent-based infrastructure belong to one network
- 2) In video message transmission, the person's location is an important issue
- 3) In a mobile agent-based infrastructure, agents of users communicate with each other directly all the time
- 4) In a mobile agent-based infrastructure, communication is done by agents

24 - According to the passage, which statement is correct?

- 1) In 4G, all media have the same tariff
- 2) Creating one billing system for all of communication systems is not easy because there are varying services
- 3) A simple billing system suffices for 4G
- 4) An exact billing system is required only for multimedia

25 - What activity is most closely related to personal mobility?

- 1) Carrier of persons
- 2) Location management
- 3) Mobility management
- 4) Terminal mobility

► *Prediction and inference*

The next sentence after the passage is most likely to be:

- 1) The old banana plants are chopped up and used as manure.
- 2) Chicken manure can now be used to feed all kinds of banana plants.
- 3) Bananas are used in dessert recipes all over the world.
- 4) Bananas are grown all over South and Central America.

► *Answer:*

✓ 1) Correct.

? 2) The word “now” is confusing. Also we expect reference to sucker plants and not to all kinds of plants

✗ 3) The leap from new banana plants to banana recipes is too extreme.

✗ 4) General information about bananas that does not follow the last sentence.

► *Restatement*

Another way of expressing the last sentence is:

- 1) Sucker plants grow beside the parent plant and create new banana plants.
- 2) A new generation of parent plants grows next to the sucker plants.
- 3) Growing next to the parent plant helps sucker plants make a new generation of banana plants.
- 4) Parent plants have sucker plants growing beside them; two generations of plants thus grow together.

► *Answer:*

✓ 1) Correct.

✗ 2) Incorrect. The new generation is one of sucker plants.

? 3) “Close” but incorrect. It is true that the sucker plant grows next to the parent plant and that it makes a new generation of plants. But the parent plant has by then died.

✗ 4) Incorrect. The second part of the sentence is wrong; the two generations do not grow together.



Sometimes incorrect choices are a subset of the correct choice. In this case, you should choose the more comprehensive choice which is called **best answer**.

► *Exercise 1 (EE 83)*

In the past, the major concerns of a VLSI designer were area, performance, cost, and reliability; power considerations were mostly of only secondary importance. In recent years, however, this has begun to change and, increasingly, power is being given comparable weight to area and speed in VLSI design.

- 20 - Who originally developed the remote surgery system?
- 1) Jacques Marescaux
 - 2) Mehran Anvari
 - 3) Phil Green
 - 4) Timothy Broderick
- 21 - Under what circumstances was the experimental remote surgery performed?
- 1) In an inconvenient, uncommon condition
 - 2) In an operating room in Strasbourg
 - 3) In cooperation with Computer Motion and Intuitive Surgical
 - 4) With a high speed connection
- 22 - On which human organ was the first remote surgery performed?
- 1) Chest
 - 2) Gallbladder
 - 3) Heart
 - 4) Kidney

Passage 8

In today's mobile market, an operator usually charges customers with a simple billing and accounting scheme. A flat rate based on subscribed services, call durations, and transferred data volume is usually enough in many situations. However, with the increase of service varieties in 4G systems, more comprehensive billing and accounting systems are needed. Customers may no longer belong to only one operator, but instead subscribe to many services from a number of service providers at the same time. It may be very inconvenient for a customer to deal with multiple service providers. Instead, a brokering service can be provided. Customers do not have to waste time handling all the financial transactions involved. To achieve this, operators need to design new business architecture, accounting processes, and accounting data maintenance. Moreover, equalization on different charging schemes is also needed. This is because different billing schemes may be used for different types of services (e.g., charging can be based on data, time, or information). It is challenging to formulate one single billing method that covers all the billing schemes involved. Furthermore, 4G networks support multimedia communications, which consists of different media components with possibly different charging units. This adds difficulty to the task of designing a good charging scheme for all customers. Besides, the media components may have different QOS requirements. It is very complicated to decide a good tariff for all the possible components. In order to build a structural billing system for 4G networks, several frameworks have already been studied. The requirements on these frameworks include scalability, flexibility, stability, accuracy, and usability.

In addition to terminal mobility, personal mobility is a concern in mobility management. Personal mobility concentrates on the movement of users instead of users' terminals, and involves the provision of personal communications and personalized operating environments. When there is a video message addressed to the mobile user, no matter where the user is located or what kind of terminal is being used, the message will be sent to the user correctly. A personalized operating environment, on the other hand, is a service that enables adaptable service presentations (in order to fit the capabilities of the terminals in use regardless of network types). Currently, there are several frameworks on personal mobility found in the literature. Mobile agent-based infrastructure is one widely studied solution. In this infrastructure, each user is usually assigned a unique identifier and served by some personal mobile agents (or specialized computer programs running on some servers). These agents act as intermediaries between the user and the Internet. A

1 - The major concerns of a VLSI designer

- 1) only include cost and reliability
- 2) are restricted to performance and cost
- 3) cover factors such as power, area, and reliability
- 4) include power consumption, area, performance, cost, and reliability



When you have two choices with very close relationship (being similar or even totally dissimilar), it is highly probable that the answer is based on this relationship. So, one of them must be the correct answer.

► Exercise 2 (EE 83)

According to the FCC, ultrawideband (UWB) is any signal that occupies at least 500 MHz of bandwidth in the 7.5 GHz chunk of spectrum between 3.1 GHz and 10.6 GHz. That definition also includes some rather strict limits on radiated power and power density: it's a lot less than the 3 mW allowed for a cell phone.

2 - Based on the text, the power spectral density of UWB pulses.....

- 1) is limited in a narrow band of frequencies
- 2) is mostly spread around the central frequency
- 3) has a tiny magnitude over a large band of frequencies
- 4) has a large magnitude over a narrow band of frequencies

► Exercise 3 (EE 83)

3 - Data is any information used to discuss or decide something. When computers were first.... they were used for this purpose.

- 1) anticipated
- 2) donated
- 3) developed
- 4) improved



When you have three choices with very close relationship, it is highly probable that the forth choice be the correct answer. It is called **farthest choice**. The farthest choice can be determined with the following criteria:

- (i) general and specific
- (ii) positive and negative
- (iii) grammatical structure

► Exercise 4 (CE 83)

4 - One of the results of thein solid-state technology is the capability of fabricating very large numbers of transistors within a single chip.

- 1) refinement
- 2) advancement
- 3) development
- 4) improvement

17 - By reading the above passage, which of the following statements would best explain what the passage reveals?

- 1) FCC may not have full authority over the users but it is successful in restricting encryption
- 2) FCC has full authority and is capable of banning encryption
- 3) FCC's authority is undeniable and can be an obstacle in controlling low-power radio
- 4) None of the above

Passage 7

A few months ago Timothy Broderick, a professor of surgery and biomedical engineering at the University of Cincinnati, chose an unusual place for an experiment in surgical robotics. As part of the NASA Extreme Environment Mission Operations, or NEEMO project, he headed out to the Aquarius habitat, located 19 meters underwater off Key Largo, Florida, and in a cramped laboratory he set up an experimental two-armed surgical robot.

Broderick requested the help of another surgeon, Mehran Anvari of McMaster University, in Hamilton, Ont., Canada, who controlled the robot from his office 2000 kilometers to the north. Despite a delay of up to 2 seconds, Anvari was able to successfully simulate complex surgical tasks, such as suturing a vein on a latex anatomical model. The surgical robot used by Broderick and Anvari was a modified version of a system originally developed in the early 1990s by Phil Green, a researcher at SRI International, for the U.S. military. The highly influential SRI project encouraged the start-up of two companies to address the civilian robotic surgery market: Computer Motion, in Goleta, Calif., and Intuitive Surgical, in Sunnyvale, California.

In 2001, Jacques Marescaux, a surgeon at the University of Strasbourg, in France, worked with Computer Motion to modify its system and perform the first remote surgery on a human patient, a gallbladder removal procedure called laparoscopic cholecystectomy. Using a dedicated high-speed connection, Marescaux controlled the robot from New York City while the patient lay in an operating room in Strasbourg.

In 2003, a lengthy patent litigation ended with the merger of Computer Motion and Intuitive Surgical. Under the name of Intuitive Surgical, the merged company is now the only one to commercialize a robotic surgical system approved by the US Food and Drug Administration. The FDA-approved procedures include general laparoscopic surgery, chest surgery, certain cardiac procedures, and urological and gynecological procedures.

18 - Under whose control, with what, and in which state was the experimental surgery mentioned in the above passage performed?

- 1) Jacques Marescaux, surgical robot, France
- 2) Mehran Anvari, a two armed robot, Florida
- 3) Phil Green, surgical robot, Florida
- 4) Timothy Broderick, a two armed robot, Canada

19 - Which country was the pioneer in performing the remote surgery?

- 1) France
- 2) Canada
- 3) U.s.A.
- 4) None of the above

► **Exercise 5 (EE 83)**

As originally developed by several start-up companies that borrowed the technology from U.S. military research, like Xtreme Spectrum Inc. (Vienna, Va.) and Discrete Time Communications (now Staccato Communications Inc., San Diego, Calif.), UWB involves transmitting low-power streams of extremely short pulses - on the order of 10-1000 picoseconds.

5 - Based on the text, the UWB technology was originally investigated by....

- | | |
|----------------------------|---------------------------------|
| 1) Military research | 2) Xtreme Spectrum |
| 3) Staccato Communications | 4) Discrete Time Communications |
- Regardless of the passage, try to find the answer (farthest choice).

► **Exercise 6 (CE 83)**

6 - The price of computer is now....

- | | |
|--------------------------------|---|
| 1) rising | 2) too high for most schools |
| 3) affordable for most schools | 4) preventing schools from buying computers |

► **Exercise 7 (EE 80)**

7 - What could be the first important piece of the thermal puzzle?

- | | |
|---------------------------------------|---------------------------------|
| 1) peak power rating | 2) maximum case temperature |
| 3) conditions for maximum performance | 4) maximum junction temperature |

► **Exercise 8 (EE 84)**

8 - Which of the following statements holds True?

- 1) one hundred percent of faults radiate light
- 2) all defects do not emit light or produce heat
- 3) every defect is sensitive to photon simulation
- 4) every fault generates a temperature rise when it occur

► **Exercise 9 (EE 81)**

9 - ITTL students are constantly reminded of what they have been learning....

- 1) since their progress constantly monitored and analyzed
- 2) through observing how those theories are applied in the building
- 3) because there is a mechanism that reminds the students whenever they pass by it
- 4) since there are sensors everywhere watching them to make sure they spend their time learning the course

Passage 6

WiMedia, the next generation of wireless connectivity, is raising some interesting questions about privacy.

WiMedia, which underlies consumer technologies such as Certified Wireless USB and the planned next iteration of Bluetooth, is based on the concept of ultra wideband radio. It uses short-range, very-low-power signals transmitted across a vast expanse of the radio spectrum - from 3.1 to 10.6 GHz. Traditional radio, on the other hand, uses a much higher-power signal across a narrow band of spectrum.

In the United States, the authority to regulate use of the radio spectrum falls to the Federal Communications Commission (FCC). U.S. courts have consistently ruled that the federal government has the power to regulate the airwaves, because radio is interstate commerce. But can the FCC really claim jurisdiction over the minuscule power levels used by WiMedia radios?

The answer to the question is important because the FCC restricts what radio broadcasters, whether licensed (as in the case of radio or TV stations) or unlicensed (as in the case of the millions of people who own Wi-Fi base stations), can do. On many licensed radio services, encryption is not allowed, as a condition of licensing. Amateur radio operators, for example, have never been allowed to send encrypted traffic; they would lose their licenses if they did.

In contrast, concerned that users be able to trust their own wireless systems, the coalition of electronics companies behind WiMedia - the WiMedia Alliance - demands that all ultra wideband radio systems sold under the WiMedia banner be capable of strong hardware encryption and that for some applications, using this encryption capability be mandatory.

So far, FCC regulations that deal with ultra wideband technologies have made no mention one way or the other of the use of encryption. But could the federal government use the authority of the FCC to enforce a law requiring that all ultra wideband transmissions be in the clear? It's not such a preposterous idea: the government's hostility to encryption was demonstrated in the 1990s, when it tried to restrict the use of Internet-based encryption technologies. In the end, the borderless nature of the Internet caused the government to admit defeat. There is no such obstacle to controlling low-power radio, however.

14 - What is meant by WiMedia?

- 1) WiMedia is the next generation of wireless connectivity based on the concept of ultra wideband radio
- 2) Wi Media is the next generation of wireless connectivity that is banned by the FCC
- 3) WiMedia is the next generation of wireless connectivity that uses high power signal across the radio spectrum
- 4) WiMedia is the next generation of wireless connectivity contradicted by the FCC

15 - What is the constraining factor that FCC imposes upon radio broadcasters?

- 1) Encryption is mandatory
- 2) Encryption technologies to be licensed
- 3) Encryption is not authorized
- 4) Licenses to be obtained

16 - In what category does the power of FCC lie?

- 1) Power to regulate use of the radio spectrum
- 2) Power to provide services for radio broadcasters
- 3) Power to restrict broadcasters
- 4) Full jurisdiction over the airwaves to regulate use of the radio spectrum

Answer Key

Lesson 1: General consideration

۱. گزینه ۴ صحیح است.
۲. گزینه ۳ صحیح است.
۳. گزینه ۱ صحیح است.
۴. گزینه ۲ صحیح است.
۵. گزینه ۴ صحیح است.
۶. گزینه ۲ صحیح است.
۷. گزینه ۴ صحیح است.
۸. گزینه ۳ صحیح است.
۹. گزینه ۱ صحیح است.
۱۰. گزینه ۴ صحیح است.
۱۱. گزینه ۲ صحیح است.
۱۲. گزینه ۳ صحیح است.
۱۳. گزینه ۳ صحیح است.
۱۴. گزینه ۳ صحیح است.
۱۵. گزینه ۳ صحیح است.
۱۶. گزینه ۱ صحیح است.
۱۷. گزینه ۲ صحیح است.
۱۸. گزینه ۲ صحیح است.
۱۹. گزینه ۱ صحیح است.
۲۰. گزینه ۳ صحیح است.
۲۱. گزینه ۱ صحیح است.
۲۲. گزینه ۲ صحیح است.
۲۳. گزینه ۴ صحیح است.

9 - In the new technology discussed in the passage, 3D data is generated from

- 1) 2D image
- 2) light patterns
- 3) biometric features
- 4) digital mapping

10 - The new technology could be used for

- 1) access control
- 2) identification in criminal cases
- 3) person identification
- 4) all of the above

Passage 5

The ionization in the ionosphere is generated when radiation from the sun strikes the gas molecules in the upper atmosphere. The radiation is of sufficient intensity that it gives the electron in some molecules sufficient energy to leave the molecular structure. This leaves a free electron and the gas molecule, having one electron too few becomes a positive ion. At very high altitudes the atmosphere is very thin, and as a result the levels of ionization are very low. As the atmosphere become denser, so the level of ionization starts to rise. However the ionization process uses up the energy of the radiation, and after a certain distance the energy of the radiation is such that it does not ionize as many gas molecules as before and the level of ionization begins to fall. It is also found that for the higher layers including the F and E layers most of the ionization results from ultra violet light. The D layer being at a lower altitude results mainly from X rays that are able to penetrate further into the atmosphere.

It is also found that the free electrons and positive ions slowly recombine. In other words the radiation is causing them to ionize, and then they slowly recombine afterwards. In chemistry this state of affairs is called a dynamic equilibrium. It means that if the source of radiation is removed, then the levels of ionization will fall. As a result the D layer disappears after nightfall, and the E layer is greatly reduced in intensity. In view of the high levels of ionization in the F layer and the fact that the air density is so much less, it takes longer for the recombination process to take place and consequently it remains over night, although its level is reduced.

11 - At very high altitudes of the atmosphere the level of ionization is low because...

- 1) atmosphere is dense
- 2) atmosphere is not dense
- 3) radiation from the sun is low
- 4) radiation from the sun is high

12 - At which layer of atmosphere ionization results from ultra violet light?

- 1) Low layers of the atmosphere
- 2) Only the E layer of the atmosphere
- 3) High layers of atmosphere including the E and F layers
- 4) Medium layers of the atmosphere including the D layer

13 - F Layer remains over night because....

- 1) source of radiation is removed
- 2) longer recombination process takes place
- 3) air density is so much high
- 4) 2 and 3

۲۴. گزینه ۲ صحیح است.

۲۵. گزینه ۳ صحیح است.

Lesson 2: Getting the essential information

تمرین ۱:

۱. گزینه ۲ درست است.

باتوجه به جمله هدف در پاراگراف اول یعنی:

The second light wave, the reference wave, falls directly onto the film.

گزینه ۲ درست است.

۲. گزینه ۴ درست است.

با توجه به عبارات انتهایی پاراگراف دوم گزینه ۴ درست است.

تمرین ۲:

۳. گزینه ۲ درست است.

سؤال بسیار ساده است. با توجه به جمله... gallbladder removal... در پاراگراف سوم می‌توان گزینه ۲ را انتخاب کرد.

۴. گزینه ۳ درست است.

باتوجه به جمله اول از پاراگراف سوم گزینه ۳ درست است.

In 2001, Jacques Marescaux,... perform the first remote surgery on a human patient

تمرین ۳:

۵. گزینه ۳ درست است.

باتوجه به جمله هدف در پاراگراف اول بسادگی گزینه ۳ درست است.

It is also found that for the higher layers including the F and E layers most of the ionization results from ultra violet light.

۶. گزینه ۲ درست است.

ضمیمه it است که در جمله it remains over night,...it takes longer for the recombination process to take place

اشاره به F layer دارد.

تمرین ۴:

۷. گزینه ۱ درست است.

باتوجه به عبارت Each unique number is known as an IP address در پاراگراف دوم گزینه ۱ درست است.

possible the realization of complete systems-on-a-chip. It is an enabling technology allowing the development of smart products, augmenting computational ability of microelectronics with the perception and control capabilities of micro-sensors and micro-actuators and expanding the space of possible designs and applications.

5 - What are the strong points of MEMS and Nanotechnology?

- 1) Low cost and computational ability
- 2) High ability and excellent materials properties
- 3) Small size and computational ability
- 4) Small size, computational ability, and low cost

6 - Where are MEMS manufactured on?

- 1) On a chip
- 2) On suspension systems for automobiles
- 3) On a silicon wafer
- 4) On motors smaller than the diameter of human hair

7 - How are MEMS manufactured?

- 1) By integrated circuits
- 2) By micromachining technology
- 3) By microelectronics technology
- 4) By microfabrication technology

Passage 4

Face recognition technology that could revolutionize security systems worldwide has been developed by computer scientists at Sheffield Hallam University. The new specialist software can produce an exact 3D image of a face within 40 milliseconds. Other 3D systems that have been trailed have proved unworkable because of the time it takes to construct a picture and an inaccurate result. The ground-breaking invention, by experts in the University's Materials and Engineering Research Institute (MERI), was tested by Home Secretary Charles Clarke on a recent visit to Sheffield. It could be used for tighter security in airports, banks, and government buildings and ID cards.

The breakthrough comes days after members of parliament (MPs) backed the compromise plans for identity cards, meaning from 2008 people applying for a new passport will also get an identity card, with their biometric details stored on a central register. The new technology works by projecting a pattern of light onto the face, creating a 2D image, from which 3D data is generated. Biometric features are extracted by a "parameterization" process, giving a digital mapping of a face that would form part of a fool-proof security system.

It is said that, this technology could be used wherever there is a need for heightened security. It is well suited to a range of applications including person identification from national databases, access control to public and private locations, matching 3D poses to 2D photographs in criminal cases, and 3D facial biometric data for smart cards such as ID and bank cards. We have developed a viable, working system at the cutting edge of 3D technology.

8 - The previous software for 3D face recognition was unworkable because it was ...

- 1) fast
- 2) slow
- 3) slow and inaccurate
- 4) fast but inaccurate

تمرین ۵:

۸. گزینه ۱ درست است.

باتوجه به عبارت The trick is to add extra primaries, the basic colors that در پاراگراف دوم گزینه ۱ درست است.

تمرین ۶:

۹. گزینه ۲ درست است.

باتوجه به کلمه shore (ساحل) در پاراگراف دوم می‌توان گزینه ۲ را انتخاب کرد.

۱۰. گزینه ۱ درست است.

باتوجه به عبارت film-canister-sized cylinders - called motes در پاراگراف اول گزینه ۱ درست است.

۱۱. گزینه ۲ درست است.

باتوجه به عبارت seabird known as Leach's storm petrel در پاراگراف اول گزینه ۲ درست است.

تمرین ۷:

۱۲. گزینه ۳ درست است.

باتوجه به جمله هدف which terminate in phono-plugs...phono-sockets گزینه ۳ بوضوح درست است.

تمرین ۸:

۱۳. گزینه ۳ درست است.

باید در متن به دنبال عبارت personal mobility گشت. باتوجه به اولین جمله از پاراگراف دوم یعنی personal mobility is a concern in mobility management.

بوضوح گزینه ۳ درست است.

تمرین ۹:

۱۴. گزینه ۲ درست است.

طبق جمله هدف it was tested on a two-legged robot called Rabbit در پاراگراف آخر، گزینه ۲ درست است. در گزینه ۴

عبارت their own robot غلط است.

تمرین ۱۰:

۱۵. گزینه ۱ درست است.

بر اساس جمله because the motor is activated only when the foot is in the air گزینه ۱ درست است.

graphical descriptions for modeling physical dynamic systems are necessary for such integration. Graphical descriptions, such as the bond graph representation, can provide techniques for modifying system characteristics, leading to proper system designs. These fundamental concepts are applicable to single and multi-energy domain systems. These systems include one or more of the following energy domains: electrical, mechanical, magnetic, chemical, and thermo-fluidic. System design of engineering systems requires a clear understanding of the system dynamic behavior and the performance specifications sought. This in turn implies the need for predicting the system behavior with and without a control system.

3 - Which of the following are needed for proper system design of forward-looking electromechanical applications?

- 1) Analytical and graphical descriptions
- 2) Disintegration of design and control
- 3) Environments with unpredictable disturbances
- 4) Use of analog signal processing boards

4 - Based on the text, what is most relevant in the systems approach?

- 1) A clear understanding of system dynamics
- 2) Combining design and control
- 3) Knowledge of performance specifications
- 4) Predicting system behavior

Passage 3

MEMS (Micro-Electro-Mechanical Systems) and Nano devices are extremely small - for example, MEMS and Nanotechnology has made possible electrically-driven motors smaller than the diameter of a human hair - but MEMS and Nanotechnology is not primarily about size. It is also not about making things out of silicon, even though silicon possesses excellent materials properties, which make it an attractive choice for many high-performance mechanical applications; for example, the strength-to-weight ratio for silicon is higher than many other engineering materials which allows very high-bandwidth mechanical devices to be realized. Instead, the deep insight of MEMS and Nano is as a new manufacturing technology, a way of making electromechanical systems using batch fabrication techniques similar to those used for integrated circuits, and uniting these electromechanical elements with electronics.

MEMS and Nanotechnology are extremely diverse technologies that can significantly affect every category of commercial and military product. They are already used for tasks ranging from in-dwelling blood pressure monitoring to active suspension systems for automobiles. Their nature and diversity of useful applications make it potentially a far more pervasive technology than even integrated circuit microchips. Historically, sensors and actuators are the most costly and unreliable part of a macro-scale sensor-actuator-electronics system. However, MEMS and Nanotechnology allows these complex electromechanical systems to be manufactured using batch fabrication techniques increasing the reliability of the sensors and actuators to equal those of integrated circuits at a much lower cost.

MEMS are the integration of mechanical elements, sensors, actuators, and electronics on a common silicon substrate through microfabrication technology. While the electronics are fabricated using integrated circuit (IC) process sequences, the micromechanical components are fabricated using compatible "micromachining" processes that selectively etch away parts of the silicon wafer or add new structural layers to form mechanical and electromechanical devices. MEMS can revolutionize nearly every product category by bringing together silicon-based microelectronics with micromachining technology, making

تمرین ۱۱:

۱۶. گزینه ۲ درست است.

طبق جمله هدف posterity will be reluctant to tread گزینه ۲ درست است.

Lesson 3: Finding the main idea

مثال ۱: گزینه ۲ درست است.

مثال ۲: گزینه ۳ درست است.

تمرین ۱:

۱. گزینه ۱ درست است.

باتوجه به انتهای پاراگراف اول که درباره HD DVD will arrive first است، گزینه ۱ درست خواهد بود.

تمرین ۲:

۲. گزینه ۴ درست است.

تمام جملات درباره مقایسه سوخت فسیلی و انرژی اتمی است.

تمرین ۳:

۳. گزینه ۲ درست است.

کل متن درباره مشکلات جستجوی ویدئو است بنابراین گزینه ۲ درست است.

تمرین ۴:

۴. گزینه ۱ درست است.

باتوجه به کلمه reveal (آشکار کردن) در صورت سؤال، سؤال از نوع تحلیلی است. گزینه ۲ کاملاً غلط است. گزینه های ۳ و ۴ جزئی هستند و موضوع اصلی محسوب نمی شود.

تمرین ۵:

۵. گزینه ۲ درست است.

دو روش عبارتند از: methods, the symbolic approach, and the connectionist...two distinct

تمرین ۶:

۶. گزینه ۲ درست است.

متن عمدتاً درباره چگونگی عملکرد transaction processing است.

تمرین ۷:

۷. گزینه ۴ درست است.

باتوجه به انتهای متن و جمله

The level of knowledge about computer organization and computer architecture that a high-level programmer must have, depends on....

EE 86

Passage 1

Central to an autonomous entity are the rules of behavior governing how it must act or react to the information collected by the detector from the environment and its neighbors. These rules determine into what state the entity should change and also what local knowledge should be released via the effector to the environment.

In order to adapt itself to a problem without being explicitly told what to do in advance, an autonomous entity must modify the rules of its behavior over time. This ability, responding to local changing conditions, is known as the individual's learning capability. Worth noting is that randomness plays a part in the decision making process of an autonomous entity despite the presence of a rule set. It allows an autonomous entity to explore uncharted territory despite evidence that it should exploit only a certain path. On the other hand, randomness helps the entity resolve conflict in the presence of equal support for suggestions to act in different ways in its own best interests and avoid being stuck by randomly choosing an action in local optima.

The environment acts as the domain in which autonomous entities are free to roam. This is a static view of the environment. The environment of a NIC (Nature-Inspired Computing) system can also act as the "noticeboard" where the autonomous entities post and read local information. In this dynamic view, the environment is constantly changing.

- 1 - If the individual's learning capacity is not high enough, an autonomous entity ...
 - 1) cannot adapt itself to a problem
 - 2) can respond to local changes
 - 3) modifies the rules of its behavior
 - 4) should be told what to do in advance
- 2 - Randomness being a part of decision making process...
 - 1) leads to confusion because of the presence of a rule set
 - 2) cannot work in the presence of a rule set
 - 3) allows the autonomous entity to explore unknown areas but helps it resolve possible conflicts
 - 4) helps the autonomous entity to follow a pre-arranged path

Passage 2

Forward-looking electromechanical applications require more sophistication and flexibility from both the hardware and software points of view. Many features which were considered luxury items in a product just a few years ago have now become standard items. This reality has led to new requirements for system design. The integration of design and control becomes even more relevant in the systems approach. These are important aspects not only for industrial research and development personnel but also for academicians. The specific application often dictates the system design requirements and control system characteristics. The applications considered emphasize the demand for high-performance systems which has introduced an increasingly challenging system design problem. These systems involve multi-energy domains, exhibit significant dynamic changes, and operate in environments where unpredictable disturbances are possible.

The applications discussed in this paper include robot manipulators, high-speed and high-precision magnetic bearing systems, atomic resolution systems, and their control using digital signal processing boards. In general, the design procedure involves the integration of design and control. Analytical and

گزینه ۴ درست است.

تمرین ۸:

۸. گزینه ۱ درست است.

متن از نوع partial essay است که هریک از پاراگرافها دارای موضوع جداگانه‌ای هستند. گزینه‌های ۲ و ۳ و ۴ جامع نیستند و تنها به یک پاراگراف می‌پردازند.

تمرین ۹:

۹. گزینه ۲ درست است.

پاراگرافهای یک و دو هر دو به بحث Human memory می‌پردازند.

Lesson 4: Restatement questions

مثال ۱: گزینه ۳ درست است.

مثال ۲: گزینه ۲ درست است.

مثال ۳: گزینه ۱ درست است.

مثال ۴: گزینه ۱ درست است.

مثال ۵: گزینه ۴ درست است.

مثال ۶: گزینه ۴ درست است.

تمرین ۱:

۱. گزینه ۴ درست است.

متن ارتباط بین انواع رباتها را نشان می‌دهد. ربات cyborg تعمیم یافته automaton و flexible machine و mobile robot و android است. در گزینه ۱ عبارت inorganic اشتباه است. گزینه ۲ با تعریف automaton و گزینه ۳ با تعریف mobile robot در تضاد هستند.

تمرین ۲:

۲. گزینه ۲ درست است.

جمله هدف Geometric hashing permitted the detection of objects در پاراگراف اول آمده است. در گزینه ۲ کلمه identifying بجای detection و کلمه shapes بجای objects استفاده شده است.

تمرین ۳:

۳. گزینه ۴ درست است.

باتوجه به عبارت first important piece در صورت سؤال که بازنویسی شده first step در متن است می‌توان متوجه شد که جمله هدف همان اولین جمله متن است. بنابراین گزینه ۴ درست است که در آن بجای conditions for maximum performance از

Passage 8:

Associated	مرتبط
Reliability	قابلیت اطمینان
Density	چگالی
Furthermore	بعلاوه
Portable applications	کاربردهای قابل حمل
Promote	ترقی دادن
Favor	التفات
Implementation	پیاده سازی
Power supplies	منبع تغذیه
Communication	مخابرات
Predict	پیش بینی کردن
Target	هدف
Threshold voltage	ولتاژ آستانه
Available	در دسترس
Pose	حالت
Challenge	چالش
Amplifier	تقویت کننده
Inverter	معکوس کننده
Transmission gates	گیت‌های انتقالی
Magnitude	بزرگی
Sufficient	کافی
Apply	اعمال کردن
Consequently	در نتیجه
Depletion-mode	حالت تخلیه‌ای

requirements for optimum operation استفاده شده است. اگر پس از یافتن جمله هدف توقف نکنید ممکن است سایر گزینه‌ها را انتخاب نمائید.

تمرین ۴:

۴. گزینه ۲ درست است.

در جمله Their designs were predicated almost entirely on practicality از practicality به distribution systems اشاره دارد. در گزینه ۲ بجای experience از practical استفاده شده است.

تمرین ۵:

۵. گزینه ۱ درست است.

باتوجه به کلمات بکار رفته در صورت سؤال، جمله هدف اولین جمله متن است که بدلیل As یک جمله complex است. در جمله As the drive for further integration of عبارت further integration بجای ever-increasing در گزینه ۱ بکار رفته است.

۶. گزینه ۲ درست است.

باید به دنبال special issue بود که در دو جای متن به آن اشاره شده است. جمله هدف آخرین جمله متن است. در گزینه ۱ کلمه alone اشتباه است. در گزینه ۳ عبارت non-behavioral اشتباه است.

تمرین ۶:

۷. گزینه ۱ درست است.

براساس کلمه under closer scrutiny بوضوح جمله اول متن، جمله هدف است. این جمله یک جمله complex بوده و بوضوح گزینه ۱ درست است.

تمرین ۷:

۸. گزینه ۱ درست است.

باید به کلمه کلیدی thumb-sized در صورت سؤال توجه کنید و خواندین را ادامه ندهید. باتوجه به جمله introducing a thumb-sized fuel cell that it says can power an MP3 player در صورت سؤال، گزینه ۱ درست است.

تمرین ۸:

۹. گزینه ۱ درست است.

بهترین روش پاسخ‌دهی به این سؤال یافتن جمله هدف و توقف در خواندن است. گزینه ۱ بوضوح در پاراگراف اول آمده است و چون سایر گزینه‌ها تکمیل شده این گزینه نیستند، براحتی می‌توان این گزینه را انتخاب نمود.

Passage 7:

Commercial	تجاری
Whereby	که بوسیله آن
Inject	تزریق کردن
Determine	تعیین کردن
Distortion	اعوجاج
Approach	روش
Provide	تهیه کردن
Realistic	واقعی
Domain	حوزه
Variable	متغیر
Characteristic	مشخصه
Constraint	محدودیت
Iterative technique	روش تکرار پذیر
Literature	مطبوعات
Emphasis	تاکید
Comparison	مقایسه
Accuracy	دقت
Attention	توجه
Superior	برتر
Realistic conditions	شرایط واقعی
Firing angle	زاویه آتش
Valve	شیر- درب
Converter	مبدل
Incorporation	مشارکت
Modulation	مدولاسیون
Derivation	مشتق گیری
Individual	منحصر بفرد
Instants	فوری
Transfer	انتقال
Influence	نفوذ- تاثیر
Accounted	شمردن- حساب کردن

تمرین ۹:

۱۰. گزینه ۴ درست است.

در گزینه ۱ کلمه only غلط است. گزینه‌های ۲ و ۳ بخشی از گزینه ۴ بوده و کامل نیستند.

تمرین ۱۰:

۱۱. گزینه ۳ درست است.

جمله هدف stalwart marketing of awkward software است. stalwart صفت marketing و awkward صفت software است. در گزینه‌های ۱ و ۲ و ۴ جای این صفتها با هم و یا با قید آنها عوض شده است که غلط خواهند بود. در گزینه ۳ از مترادف awkward و stalwart استفاده شده است.

تمرین ۱۱:

۱۲. گزینه ۱ درست است.

جمله هدف The quality of communication that takes place in an organization is greatly affected by the overall design of that organization. است که یک جمله مجهول می‌باشد. overall design of that organization فاعل و quality of communication مفعول است. تنها در گزینه ۱ جای فاعل و مفعول درست است.

تمرین ۱۲:

۱۳. گزینه ۳ درست است.

براساس no mention is made of the development of the internet protocol گزینه ۳ درست است.

تمرین ۱۳:

۱۴. گزینه ۲ درست است.

باتوجه به جمله هدف

If the client decides that IR should press ahead and design a viable product, both sides sign a contract

گزینه ۲ درست است. drawn up بجای sign استفاده شده است.

۱۵. گزینه ۴ درست است.

در پاراگراف آخر آمده است

that prevents IR from offering that product or developing a similar one for another client

بنابراین گزینه ۴ درست است.

Assurance	بیمه
Obtain	بدست آوردن
Significant	قابل توجه
Development	توسعه
Profitably	بطور مفید

Passage 6:

Depth	عمق
Manipulate	دستکاری کردن
Resolution	درشت نمایی
Screen	صفحه نمایش
Contain	شامل
Inherently	ذاتی
Interact	تعامل
Imposing	تحمیل کننده
Object	شیء
Initially	بطور اولیه
In phase	همفاز
Illuminate	روشن کردن
Reference	مرجع
Strike	برخورد کردن
Precisely	به دقت
Interference	تداخل
Pattern	الگو
Superposition	جمع آثار
Presentation	نمایش
Tiny	ظریف
Attach	پیوستن

تمرین ۱۴:

۱۶. گزینه ۳ درست است.

جمله هدف monitor itself, change the functions it performs, and repair its damaged circuits - all without external intervention اولین جمله متن است. در گزینه ۳ external command بجای external intervention آمده است.

۱۷. گزینه ۴ درست است.

جمله هدف

fuses and redundant circuits have worked hand in hand to repair chips and increase the number of usable chips on a wafer

در پاراگراف آخر آمده است. گزینه ۱ بازی با کلمات است. گزینه‌های ۲ و ۳ خارج از جمله هدف هستند.

تمرین ۱۵:

۱۸. گزینه ۴ درست است.

ضمیر This در آخرین جمله به increasing the test application time اشاره دارد. در جمله هدف به کلمه ربط and دقت کنید. and observe circuit response...is mainly due to extra tester clock cycles بنابراین گزینه ۴ کاملتر است.

Lesson 5: Inference questions

مثال ۱: گزینه‌های (۱) (۲) (۳) درست هستند.

مثال ۲: گزینه ۳ درست است.

مثال ۳: گزینه ۲ درست است.

مثال ۴: گزینه ۲ درست است.

مثال ۵: گزینه ۱ درست است.

مثال ۶: گزینه ۳ درست است.

مثال ۷: گزینه ۱ درست است.

تمرین ۱:

۱. گزینه ۱ درست است.

در متن صحبتی از electricity lab نشده است. گزینه ۲ را نمی‌توان از متن استدلال کرد. گزینه‌های ۳ و ۴ در متن اشاره شده‌اند که درست نیز نیستند.

تمرین ۲:

۲. گزینه ۲ درست است.

براساس جمله آخر متن تنها می‌توان گزینه ۲ را استنباط کرد.

Passage 4:

Industrial	صنعتی
Automation	اتوماتیک
Spectrum	طیف
Complexity	پیچیدگی
Perform	انجام دادن
Led to	منجر شدن به
Lack	کمبود - فقدان
Maintain	نگهداری کردن
Modify	تغییر دادن - بهبود دادن
Encourage	تشویق کردن
Vendor	فروشنده
Dominance	غلبه - سلطه
Stagnation	رکود
Innovation	نوآوری

Passage 5:

Competitive	رقابتی
Arena	عرصه
Generation station	نیروگاه
Entrepreneurs	مدیر موسسه
Contract	قرارداد
Advent	ظهور - پیدایش
Expedite	تسریع کردن
Maturing	بالغ شدن
Survivor	بازمانده
Inevitable	اجتناب ناپذیر
Consolidation	تحکیم و تثبیت
Witness	گواهی - شهادت
Considerable	قابل ملاحظه
Financial	مالی و تجاری

تمرین ۳:

۳. گزینه ۴ درست است.

ضمیر These در جمله These tinkers paid about \$50,000 and got computing power that به دانشمندانی اشاره دارد که برای صرفه‌جویی در هزینه بجای استفاده از کامپیوتر از Sony Playstations استفاده کرده‌اند. گزینه ۱ کاملاً غلط است. گزینه‌های ۲ و ۳ خیلی عام هستند.

تمرین ۴:

۴. گزینه ۱ درست است.

در تمام گزینه‌ها از عبارت 4 استفاده شده است. ولی چون پس quartet از who استفاده شده است گزینه ۱ درست خواهد بود.

تمرین ۵:

۵. گزینه ۲ درست است.

traditional methods در مقابل استفاده از کامپیوتر بجای معلم انسانی استفاده شده است. بنابراین گزینه‌های ۱ و ۴ غلط هستند و درست بودن گزینه ۳ را نمی‌توان استدلال کرد.

تمرین ۶:

۶. گزینه ۴ درست است.

درست بودن گزینه ۱ را نمی‌توان از متن استدلال کرد. گزینه‌های ۲ و ۳ طبق متن غلط هستند. در نتیجه گزینه ۴ باید درست باشد.

تمرین ۷:

۷. گزینه ۱ درست است.

طبق جمله

intelligent was a favorite topic in conference halls and journal pages. Spectrum was no exception.

می‌توان استدلال کرد که Spectrum نیز یک journal است.

۸. گزینه ۲ درست است.

باتوجه به مثالهای پاراگراف آخر و جمله the journey continues for AI researchers گزینه ۲ درست خواهد بود. گزینه‌های ۱ و ۳ طبق متن غلط هستند و گزینه ۴ بی‌معنی است.

تمرین ۸:

۹. گزینه ۴ درست است.

گزینه ۱ اگر چه درست است اما استدلالی نیست. گزینه ۲ درباره روشهای قبلی است. گزینه ۳ بی‌معنی است. از جمله so there is little fear that it will accidentally remove می‌توان درست بودن گزینه ۴ را استدلال کرد.

Important Vocabularies

Passage 1:

Incandescent	ملتهب
Acme	اوج- قله
Impairing	خراب کردن- زیان رساندن
Alternative	جایگزین
Entirely	کاملا
Civic	شهری

Passage 2:

Performance	بازده و کارایی
Combination	ترکیب
Consists of	شامل
Common	متداول- مشترک
Mobility	جابجایی
On the other hand	از سوی دیگر
Structure	ساختار
Manufacturing processes	پروسه ساخت

Passage 3:

Absolutely	مطلقا
Essential	ضروری
Restrict	محدود کردن
Blindfold	با چشم بسته
Equipment	لوازم
Adequate	کافی
Aligning	تراز کردن
Worthwhile	ارزشمند- ارزنده
Terminate	خاتمه دادن
Available	در دسترس

تمرین ۹:

۱۰. گزینه ۴ درست است.

XML از RDF استفاده می‌کند. طبق عبارت allowing logical inferences to be made می‌توان درست بودن گزینه ۴ را استدلال کرد.

تمرین ۱۰:

۱۱. گزینه ۱ درست است.

باتوجه به کلمه reveal (آشکار کردن) در صورت سؤال، سؤال از نوع تحلیلی است. گزینه ۲ کاملاً غلط است. گزینه های ۳ و ۴ جزئی هستند و موضوع اصلی محسوب نمی‌شود.

تمرین ۱۱:

۱۲. گزینه ۲ درست است.

کل متن درباره استفاده از Holinser که از یک ابزار ساده یعنی انبر دندانپزشکی (dental forceps) ساخته شده است و کاربرد زیادی در ماموریت‌های فضایی پیدا کرده است توضیح می‌دهد.

تمرین ۱۲:

۱۳. گزینه ۲ درست است.

طبق جمله اول personal listening بجنگ car stereo رفته است بنابراین می‌توان درست بودن گزینه ۲ را استدلال کرد.

تمرین ۱۳:

۱۴. گزینه ۱ درست است.

طبق جمله آخر متن یعنی

The drawback is that this process is a lengthy and costly one.

که مشکلات سیستم‌های امروزی را مطرح می‌کند می‌توان درست بودن گزینه ۱ را استدلال کرد.

تمرین ۱۴:

۱۵. گزینه ۳ درست است.

با توجه به عبارت deduce (استنباط کردن) سؤال از نوع تحلیلی است. با توجه به عبارت That was not entirely true در پاراگراف دوم که به بدون آلودگی بودن الکتریسته اشاره دارد می‌توان گزینه ۳ را انتخاب کرد.

تمرین ۱۵:

۱۶. گزینه ۴ درست است.

به دو جمله اول پاراگراف دوم توجه کنید. همچنین به ضمیر this ability که دو جمله را بهم پیوند می‌دهد نیز دقت کنید. این جمله دقیقاً برعکس گزینه ۴ است که چون صورت سؤال نیز منفی شده متن است، گزینه درست گزینه ۴ خواهد بود.

- 24 - What is the most viable solution for the threshold voltage limitations?
- 1) Using BJT or JFET
 - 2) Further consumption of NMOS in output
 - 3) Applying signal to bulk instead of the gate
 - 4) Applying signal to the source instead of the gate
- 25 - Taking the gate-source potential to a dc voltage sufficient to turn on the MOSFET, connecting drain normally and applying the signal between the bulk and the source would result in ...
- 1) low-input impedance depletion-mode device
 - 2) high-input impedance depletion-mode device
 - 3) low-input impedance enhancement-mode device
 - 4) high-input impedance enhancement-mode d

Lesson 6: Point of view

تمرین ۱:

۱. گزینه ۱ درست است.

گزینه‌های ۲ و ۳ و ۴ کاملاً غلط هستند. باتوجه به عبارات *anxious* و *irritated* در متن گزینه ۱ درست است.

تمرین ۲:

۲. گزینه ۲ درست است.

در متن هم جملات مثبت مانند *There is no doubt that wireless telephone benefit our society* و هم جملات منفی نظیر *antennas are unsightly intrusion into local parks and playgrounds* آمده است. بنابراین باید به جمله آخر که نتیجه گیری است مراجعه کرد. در این جمله آمده است:

The industry needs to approach the planning and installation of antennas with greater senility and creativity than it has shown to date.

فعل *needs* پیشنهادی است و می‌توان درست بودن گزینه ۲ را استدلال کرد. گزینه ۱ کاملاً مثبت و گزینه‌های ۳ و ۴ کاملاً منفی هستند اما گزینه ۲ شرطی است.

تمرین ۳:

۳. گزینه ۲ درست است.

براساس جمله *Bates was right, and the journey continues for AI researchers* می‌توان درست بودن گزینه ۲ را استدلال کرد.

تمرین ۴:

۴. گزینه ۳ درست است.

معنی گزینه‌ها عبارتند از:

- | | | | |
|------------|-------------|------------------|----------|
| ۱- پرتراوت | ۲- واقع بین | ۳- دل‌تنگ و غریب | ۴- متفکر |
|------------|-------------|------------------|----------|
- باتوجه به انتهای پاراگراف اول یعنی

those curled and faded pieces of cardboard were more real than the thousands of vibrant displays....

گزینه ۳ درست است.

تمرین ۵:

۵. گزینه ۴ درست است.

عبارت *hardly believe* به معنی انتظار نداشتن است. در نتیجه گزینه ۴ درست است.

- 19 - Which techniques are important to solve variables such as controller characteristics and firing angle constraints?
- 1) Direct solution
 - 2) Newton's method
 - 3) Indirect solution
 - 4) Iterative techniques
- 20 - What was an early cause of firing angle modulation?
- 1) The use of frequency control
 - 2) The use of individual firing control
 - 3) The use of impedance variable control
 - 4) The use of harmonic current source control

Passage 8

Factors associated with the scaling of CMOS technology such as reliability and density are driving down supply voltages. Furthermore, the rapid growth of portable applications promotes battery operation which favors low voltage and low power circuits. As a result, many suggest that future implementation of mixed analog-digital circuits using standard CMOS will have power supplies of 1.5 V or less. Communication large-scale integrations (LSIs) are predicted to be the target. Threshold voltages of future standard CMOS technologies may not decrease much below what is available today. This poses a great challenge to CMOS analog/mixed signal circuit design. Consider the standard push-pull CMOS amplifier/inverter and transmission gates. These circuits require the analog power supply to be at least equal to the sum of the magnitudes of the n-channel and p-channel thresholds. Probably the most important solution to the threshold voltage limitation is the bulk-driven MOSFET. The gate-source potential is taken to a dc voltage that is sufficient to turn on the MOSFET. The drain is connected normally and the signal is applied between the bulk and the source. The current flowing from the source to drain is modulated by the reverse bias on bulk-channel junction. The result is a junction field-effect transistor with the bulk as the signal input gate. Consequently, a high-input impedance depletion-mode device would result.

- 21 - What factors are the driving forces for reduced supply voltages of CMOS?
- 1) Device density
 - 2) Device reliability
 - 3) Hybrid technology
 - 4) Both 1 and 2
- 22 - What can be predicted as the great challenge in designing the analog circuits?
- 1) Low power CMOS
 - 2) Threshold voltage
 - 3) Mixture of analog and digital blocks
 - 4) Portable instruments and battery usage capability
- 23 - The threshold voltage of standard CMOS technologies
- 1) need not change at all
 - 2) would be reduced drastically
 - 3) will have to decrease to meet the current challenge
 - 4) may not decrease much below what is available today

تمرین ۶:

۶. گزینه ۳ درست است.

عبارت looms large به معنی مسئله نگران کننده‌ای است که زیاد نیز وجود دارد. گزینه‌های ۱ و ۴ فقط بر وجود تاکید دارند. گزینه‌های ۲ و ۳ به هم نزدیک هستند اما در گزینه ۳ مسئله نگران کننده بیشتر وجود دارد.

تمرین ۷:

۷. گزینه ۱ درست است.

از عبارت enough to be dangerous if it falls off a desk می‌توان به سنگینی راهنما (manual) پی برد. گزینه‌های ۲ و ۴ برای نرم‌افزار Mathematica درست هستند. راهنما به خودی خود خطرناک نیست بنابراین گزینه ۳ نیز غلط است.

تمرین ۸:

۸. گزینه ۳ درست است.

متن درباره روشهای تفکیک ارقام اول از غیر اول است.

تمرین ۹:

۹. گزینه ۱ درست است.

گزینه ۴ بدلیل استفاده از کلمات مشابه سریع رد می‌شود. در گزینه ۳ origin is the same اشتباه است. هر دو ترانزیستور کار یکسانی را انجام می‌دهند اما تکنولوژیهای مختلفی دارند. مقایسه سیب با پرتغال یعنی مقایسه دو چیزی که قابل مقایسه نیستند.

تمرین ۱۰:

۱۰. گزینه ۱ درست است.

عبارت years away اشاره به زمان آینده دارد.

Lesson 7: Standard questions

تمرین ۱:

۱. گزینه ۱ درست است.

نکته سؤال ارتباط بین پاراگراف های متوالی است. عبارت As originally developed در پاراگراف دوم به UWB در پاراگراف اول اشاره دارد. باتوجه به borrowed the technology from U.S. military research گزینه ۱ کاملتر از سایر گزینه‌ها است.

تمرین ۲:

۲. گزینه ۱ درست است.

نکته سؤال ارتباط بین پاراگراف های متوالی است. عبارت More serious is the need در پاراگراف دوم به physical fault isolation در پاراگراف اول اشاره دارد.

- 14 - What is meant by the reference wave?
- 1) Laser light
 - 2) The light wave that falls directly onto the film
 - 3) The third light wave that strikes the hologram
 - 4) The light wave that illuminates the object to be imaged
- 15 - What are the principal tools used to create the image discussed in the passage?
- 1) An autostereoscopic display, tiny lenses, and a digital projector
 - 2) An autostereoscopic display, a large screen, and a digital projector
 - 3) An autostereoscopic display, special glasses, and a digital projector
 - 4) An autostereoscopic display, a white-light hologram, and a digital projector

Passage 7

Most current commercial packages for harmonic analysis use a direct solution method whereby a harmonic current source, specified in advance, is injected into the linear network to determine the voltage and current distortion levels. This approach provides realistic frequency domain models of the linear ac system. However, a harmonic current source is usually an oversimplified model of the non-linear plant. The overall solution for twelve pulse converter test system depends not only on the system voltage source, current source and impedances, but on converter variables such as controller characteristics, firing angle constraints, etc. Iterative techniques are thus necessary to solve all these variables together to reach a final correct solution. In the harmonic models of ac-dc system available in the literature, the emphasis is on the solution technique, with a clear trend towards the Newton method. In comparison, the question of model accuracy has been given very little attention and some early models are still superior to those recently described.

Under realistic conditions, the switching instant of the bridge valves are not equispaced over one cycle due to converter action. The incorporation of switching angle modulation in the converter model permits an accurate derivation of the individual switching instants; their effect on transfers between the ac and dc system must be quantified, and all causes influencing the modulation must be accounted for. An early cause of firing angle modulation was the use of individual firing control.

- 16 - Which method is used in commercial packages for harmonic analysis?
- 1) Iterative solution
 - 2) Direct solution
 - 3) Indirect solution
 - 4) Injection solution
- 17 - For what kind of system does the direct solution method provide realistic frequency domain models?
- 1) Linear ac systems
 - 2) Linear dc systems
 - 3) Non-linear systems
 - 4) Linear ac and dc systems
- 18 - Which of the following items does the overall solution for twelve-pulse converter test system depend on?
- 1) Converter variables
 - 2) System voltage sources
 - 3) Current sources and impedances
 - 4) All of the above

تمرین ۳:

۳. گزینه ۱ درست است.

باتوجه به عبارت converts data into information در پاراگراف اول و موضوع سایر پاراگرافها گزینه ۱ درست است. متن از نوع fully essay است.

تمرین ۴:

۴. گزینه ۳ درست است.

متن از نوع fully essay است. باتوجه به جمله آخر از پاراگراف اول بوضوح گزینه ۳ درست است.

۵. گزینه ۲ درست است.

برای نتیجه گیری باید به پاراگراف آخر مراجعه کرد. براساس جمله Bates was right, and the journey continues for AI researchers گزینه ۲ درست است.

تمرین ۵:

۶. گزینه ۳ درست است.

متن از نوع partial essay است. هر کدام از پاراگرافها یکی از مشکلات monitoring systems را بیان می کنند. بنابراین گزینه ۳ که اشتراک این دو موضوع است جواب مورد نظر خواهد بود.

تمرین ۶:

۷. گزینه ۲ درست است.

پاراگراف اول لزوم پیدایش data warehouse و سایر پاراگرافها در مورد data warehouse هستند بنابراین متن از نوع fully essay است و گزینه ۲ درست خواهد بود.

تمرین ۷:

۸. گزینه ۱ درست است.

گزینه های ۲ و ۳ و ۴ عناوین جزئی هستند اما گزینه ۱ جذابیت بیشتری دارد.

تمرین ۸:

۹. گزینه ۱ درست است.

کل متن درباره صنعت کامپیوتر چین است. بجز گزینه ۱ سایر گزینهها خیلی عام هستند. مثلا در گزینه ۲ تبدیل از چه چیزی به چه چیزی مطرح نشده است و یا در گزینه ۴ موضوع توسعه نامشخص است.

تمرین ۹:

۱۰. گزینه ۱ درست است.

نکته سؤال حدس موضوع پاراگراف بعدی است. با توجه به جمله آخر از پاراگراف آخر که درباره permanent faults است، گزینه ۱ درست است.

Passage 6

The beauty of three-dimensional graphics packages used by engineers and scientists is that viewer can not only see an image in depth from different angles but can also manipulate it with software. The resolution of the image, however, is limited to the resolution of the graphics program, or of the screen on which the graphics are viewed - which is typically megapixels at most. Holograms, on the other hand, can contain terapixels of data and are inherently 3-D. But because these holographic images are fixed in the holographic film, the viewer cannot manipulate the image or interact with it, except to view it from different angles. But now, a research group at the Bauhaus University in Weimar, Germany, has developed a method for combining the interactivity of computer graphics with the data richness of the hologram by superimposing the holographic image and the 3-D graphics image. To understand how the Bauhaus University's method works, consider how a hologram is made and how it re-creates a 3-D image of an object. To make a hologram, laser light is split into two light waves that are initially in phase. One of waves illuminates the object to be imaged, and the light reflected from the object travels to a holographic film. The second light wave, the reference wave, falls directly onto the film. Because the distance that the first light wave travels varies according to where it strikes the object, it will generally arrive at the film out of phase with the reference wave. The amount by which it is out of phase depends precisely on where it strikes the object.

The two out-of-phase light waves create an interference pattern on the film. And this interference pattern contains all of the information needed to re-create a high-resolution image of the object when a third light wave strikes the hologram at the same angle as the reference wave that helped to create it. In most holograms, white light, typically from a halogen bulb, rather than laser light, is used to re-create the image. To create the superposition of the two images, Bauhaus University researchers mainly use three pieces of equipment: an autostereoscopic display, which allows viewing of 3-D graphics without the use of special glasses; a white-light hologram; and a digital projector, such as one used to display presentations stored on a computer onto a larger screen.

The autostereoscopic display shows images of 3-D graphics through a plastic sheet of tiny lenses that direct a different image to each eye. The holographic film is directly attached to the front of the display screen. When the digital projector illuminates the hologram, the recreated 3-D images from the hologram and the display appear to the viewer in the same volume of space. The power of the technique comes from the ability to control the direction and intensity of the light from the digital projector, and thus to control which parts of the hologram are re-created and which are not.

12 _ What is the difference between a 3-D image and a holographic image?

- 1) The former image is limited to the graphics program while the latter is rather interactive
- 2) A 3-D image is limited in resolution while a holographic image can contain terapixels of data
- 3) In the former the image has depth and can be manipulated with the help of software while in the latter the image is fixed
- 4) All of the above

13 _ What has the research group at Bauhaus University achieved? A Method...

- 1) to recreate a 3-D image of an object
- 2) to manipulate the holographic image
- 3) for combining the interactivity of computer graphics
- 4) to superimpose the holographic image and the 3-D graphics image

تمرین ۱۰:

۱۱. گزینه ۴ درست است.

نکته سؤال حدس موضوع پاراگراف بعدی است. با توجه به جمله آخر از پاراگراف آخر که درباره a promising material است، گزینه ۴ درست است.

تمرین ۱۱:

۱۲. گزینه ۱ درست است.

باتوجه به ارتباط دهنده Nevertheless در پاراگراف اول، موضوع دو جمله مربوط به آن با هم متضاد هستند. جمله اول بدلیل appears difficult to achieve منفی و جمله دوم بدلیل استفاده از hope to مثبت است. اما چون آخرین جمله مثبت است، متن اغلب مثبت (mostly positive) خواهد بود. در نتیجه باید به دنبال یک جمله complex sentence بود که بخش اصلی آن مثبت باشد. گزینه های ۲ و ۳ ساده هستند (گزینه ۲ کاملاً منفی و ۳ کاملاً مثبت). در گزینه ۴ کلمه students بجای contributors آمده است که کاملاً غلط خواهد بود.

۱۳. گزینه ۳ درست است.

نکته سؤال ارتباط بین پاراگراف های متوالی است. برای درک این ارتباط باید به انتهای پاراگراف اول و ابتدای پاراگراف دوم مراجعه کرد. باتوجه به interdisciplinary thinking گزینه ۳ درست است.

تمرین ۱۲:

۱۴. گزینه ۴ درست است.

متن درباره توازن هزینه و ارزش اطلاعات است. بنابراین گزینه ۴ درست است. عبارت characteristics needed by managers به accuracy, timeliness, completeness, and conciseness اشاره دارد.

تمرین ۱۳:

۱۵. گزینه ۳ درست است.

برای نتیجه گیری باید به جمله آخر متن مراجعه نمود. باتوجه به عبارت Understanding its development process can help us که حالت شرطی دارد گزینه ۳ درست است.

تمرین ۱۴:

۱۶. گزینه ۳ درست است.

موضوع پاراگراف دوم درباره intelligence است. باتوجه به جمله نتیجه گیری (جمله آخر) تنها گزینه ۳ درباره intelligence است.

تمرین ۱۵:

۱۷. گزینه ۱ درست است.

جمله نتیجه گیری آخرین جمله متن است که با Thus شروع شده است. باتوجه به عبارت how can we help but wonder what new realms Linux may conquer next?

- 7 - Which of the following does NOT the author list as a characteristic of "industrial automation" that would result in difficulties in control systems?
- 1) Novelty
 - 2) Complicacy
 - 3) Lack of uniformity in parts
 - 4) Difficulty in making changes
- 8 - There is information in the passage to support which of the following conclusions?
- 1) The vendor dependency has slowed down enhancement in control systems quality
 - 2) The adoption of better design approaches is severely handicapped due to lack of knowledge
 - 3) The components are usually selected on a performance basis rather than vendor dependency
 - 4) The machines consisting of suitable combinations of system hardware and software are easier to improve

Passage 5

The MASSPOWER project and its development represents a future model for how power generation projects may be put together in the new competitive energy arena in the United States and in many countries throughout the world. Gone are the days when electric utilities built large central generation stations on a cost-of-service basis as the only alternative to providing electric power and gone also are the early days of cogeneration when thinly capitalized entrepreneurs obtained power contracts while working out of their suitcases. The advent of formal competitive bidding programs as the way of supplying new electric power has expedited the maturing of the non-utility power generation industry. The survivors of the inevitable consolidation we are currently witnessing will need to take considerable market and financial risk before reasonable assurance can be obtained about a project's success. MASSPOWER was one of the first projects to be developed in this new climate and to have such a significant amount of development capital put at risk. Understanding its development process can help us understand what it will take to be successful at profitably building power plants in the future.

- 9 - The author believes that those interested in the MASSPOWER project ...
- 1) have accepted its financial risk
 - 2) do not fully understand its difficulties
 - 3) are thinking of finding ways to ensure its success before building power plants
 - 4) have accepted that power generation based on cost-of-service is a good alternative to MASS POWER generation
- 10 - The passage provides information that would answer all of the following questions EXCEPT ...
- 1) what is considered on inviting programs
 - 2) what does the author think of large central power stations
 - 3) does MASSPOWER project present a positive competitive energy activity
 - 4) does the author suggest the MASSPOWER project as the only alternative to providing electric power
- 11 - We may conclude from the passage that ...
- 1) the project initially conceived should be centered around important factors
 - 2) MASSPOWER project will be of little success unless profitable power plants are developed
 - 3) if all the details of the development process are digested, the MASSPOWER project can be a success
 - 4) the entrepreneurs should have the required knowledge and skills to plan improved strategies

گزینه ۱ درست است.

Lesson 8: Defining vocabulary in context

مثال ۱:

باتوجه به کلمه and و کلمات modify and refine می توان حدس زد که معنی refine (پالایش کردن) به modify (بهبود دادن) نزدیک باشد.

مثال ۲:

Although دو جمله با هم متضاد هستند. پس میتوان حدس زد moderately (بطور معمول) رابطه عکس با any داشته باشد.

مثال ۳:

از روی مثال such as recognizing objects by sight می توان به معنی perceptual (ادراکی) نزدیک شد.

مثال ۴:

براساس دلیل ارائه شده یعنی because the mobility of charge carriers is low می توان به معنی sluggish (کند) نزدیک شد.

مثال ۵:

باتوجه به all without external intervention می توان معنی autonomic (مستقل) را حدس زد.

مثال ۶:

تعریف cerebral cortex بوسیله which is the brain's center of intelligence آمده است.

مثال ۷:

از روی مثال order of 10-1000 picoseconds می توان معنی excessively (بی نهایت) را حدس زد.

تمرین ۱:

۱. گزینه ۱ درست است.

باتوجه به عبارت links become clogged تنها فعل مناسب برای لینکها گزینه ۱ است.

تمرین ۲:

۲. گزینه ۴ درست است.

باتوجه به specially reinforced raised floor می توان حدس زد که بدلیل وزن زیاد ابر رایانه ها کف اتاق نگهداری آنها باید مقاوم باشد.

تمرین ۳:

۳. گزینه ۴ درست است.

cumbersome صفت traditional information systems technology است. باتوجه به take days or weeks می توان کند

بودن آنها (یا ناکارآمد بودن آنها) را حدس زد.

3 - An HEMT transistor offer....

- 1) low noise
- 2) high power
- 3) operate at microwave frequencies
- 4) 1 & 2

4 - Gallium arsenide is generally used in a HEMT transistor since

- 1) it can not form a pn junction
- 2) it has a high level of electron mobility
- 3) it has a low level of electron mobility
- 4) Si has a high level of electron mobility

Passage 3

For fault-finding you must have at least a multi meter, either analogue or digital. An oscilloscope is not absolutely essential but you will find yourself very restricted without one. It's like trying to repair a car while wearing a blindfold. For audio equipment, a signal source is needed. Clearly a function generator is useful but simpler and cheaper alternatives work well in most cases. You only need a fixed frequency source, say 400 or 1000Hz sine or square wave. For cassette recorders a tape with a constant 400Hz wave recorded on both channels is adequate for most fault-finding. However, for checking playback levels and frequency response and aligning the tape head, proper test tapes, which are expensive, are required. For serious work, a collection of test leads and audio connectors is essential. Most modern audio equipments use phono-sockets so it's worthwhile investing in cables which terminate in phono-plugs. For other types of sockets, adaptors are available.

5 - What is a less complicated and less expensive alternative for a function generator?

- 1) Signal source
- 2) A fixed source
- 3) Audio equipments
- 4) Fault-finding test tapes

6 - What are phono-sockets associated with?

- 1) Adaptors
- 2) Tests leading to audio connectors
- 3) Cables which lead to phono-plugs
- 4) All of the above

Passage 4

Industrial automation spans a huge spectrum of complexity in terms of both the physical structures of machines and the tasks that they perform. This has led to an equally wide range of control system hardware and software building blocks. The general lack of standardization between different control system components makes industrial control systems difficult to maintain, modify, and integrate. This has encouraged users to go to a single vendor for all their machine control needs in order to minimize such problems. The dominance of closed, vendor-specific solutions has generally resulted in stagnation rather than innovation and improvement in control systems.

تمرین ۴:

۴. گزینه ۴ درست است.

sync مخفف شده synchroniz است.

تمرین ۵:

۵. گزینه ۳ درست است.

براحتی می‌توان گزینه ۳ را انتخاب کرد.

تمرین ۶:

۶. گزینه ۲ درست است.

باتوجه به عبارت rest of و کلمه Internet که در متن اشاره شده است، گزینه ۲ درست است.

تمرین ۷:

۷. گزینه ۳ درست است.

باتوجه به ترکیب investing in versus what to divest. می‌توان حدس زد که divest متضاد investing باشد.

نزدیکترین گزینه، گزینه ۳ است.

تمرین ۸:

۸. گزینه ۳ درست است.

بر اساس فعل moving the way می‌توان گفت که general purpose متضاد tailor-made است. علائم "نیز کمک کمک

می‌کنند.

۹. گزینه ۱ درست است.

در متن عبارت analog to digital آمده است که می‌توان درست بودن گزینه ۱ را حدس زد.

تمرین ۹:

۱۰. گزینه ۲ درست است.

inherently به معنی ذاتی است که از روی متن نمی‌توان آنرا به راحتی حدس زد.

تمرین ۱۰:

۱۱. گزینه ۳ درست است.

بر اساس عبارت for math gurus but likely to be overwhelming for ordinary mortals می‌توان حدس زد که guru متضاد

mortal (شخص معمولی) است.

EE 85

Passage 1

Electricity's green roots run deep, starting with one of its earliest applications: the incandescent lamp. The lamp was a welcome advance, and not just for its light. In 1893, architect Frank T. Lent described electric incandescent light as "the acme of all methods of lighting neover impairing the air in it a room." Electric light was a clean, safe alternative to the gas that was being used to light businesses and homes. Gas was sooty, consumed oxygen, and released carbonic acid into the air, damaging books, curtains, and carpets.

"Smoke, ashes, and cinders are unknown because electricity is used now for which formerly fires had to be built," novelist Solomon Schindler wrote in 1894. That was not entirely true; coal-fired stations still generated most of the electricity. Although generating power centrally back then does not qualify as green by today's standards, it was less harmful to the environment than the scores of dispersed coal burning furnaces would have been. In the 19th century, factories were clustered in cities, instead - as nowadays outside of them, so clean power sources were a civic necessity. Steam replaced water power as the primary source of energy used by industries in the United States and Europe, and that resulted in grimy, smoke shrouded cities.

- 1 - Why was an incandescent lamp considered to be Green in the early days of electricity?
 - 1) Because the lamp was the acme of lighting technology
 - 2) Because the new lamp consumed oxygen and carbonic acid
 - 3) Because Gas lamp soot tarnished curtains, books and carpets
 - 4) Because the lamp replaced lighting methods that polluted living areas
- 2 - It can be deduced from the text that...
 - 1) grimy and smoke-shrouded cities are unknown to well-developed countries
 - 2) nowadays smoke, ashes and cinders are unknown because electricity has replaced them
 - 3) electricity generation was not necessarily Green given the fact that it is generated by coal-fired stations
 - 4) a century ago factories were dispersed out of the cities but nowadays they are in central urban Areas

Passage 2

The High Electron Mobility Transistor or HEMT is a form of field effect transistor (FET) that is used to provide very high levels of performance at microwave frequencies. It offers a combination of low noise figure combined with the ability to operate at microwave frequencies. The key element within a HEMT is the pn junction that it uses. It is known as hetero-junction and consists of a junction that uses different materials on either side. The most common materials used are aluminum gallium arsenide (ALGaAs) and gallium arsenide (GaAs). Gallium arsenide is generally used because it provides a high level of electron mobility which is crucial to the operation of the device. On the other hand, Silicon has a much lower level of electron mobility and that is why it is never used in a HEMT. There are a variety of different structures that can be used within a HEMT. However, they all basically use the same manufacturing processes.

تمرین ۱۱:

۱۲. گزینه ۴ درست است.

فعل hyping درباره reward (جایزه) است. سه گزینه اول مشابه بوده اما گزینه ۴ حالت تأکیدی و گسترش را دارد.

تمرین ۱۲:

۱۳. گزینه ۳ درست است.

offspring در لغت به معنی فرزند و در اینجا اشاره به ربات دارد.

تمرین ۱۳:

۱۴. گزینه ۱ درست است.

پیشوند CO بمعنی هم است و تنها در گزینه ۱ دو مورد (both virus and antivirus techniques) وجود دارد.

تمرین ۱۴:

۱۵. گزینه ۲ درست است.

last mile به نزدیکترین اسم یعنی local loops اشاره دارد.

تمرین ۱۵:

۱۶. گزینه ۳ درست است.

براساس عبارت eliminating the need for variable length records می‌توان معنی افزودگی را حدس زد.

۱۷. گزینه ۲ درست است.

emulate بمعنی تقلید کردن است که از روی متن نمی‌توان آن را حدس زد.

۱۸. گزینه ۱ درست است.

گزینه‌های ۱ و ۴ متضاد هم بوده و احتمال درست بودن آنها از دو گزینه دیگر بیشتر است.

تمرین ۱۶:

۱۹. گزینه ۱ درست است.

tele به معنی دور است که تنها در گزینه ۱ ذکر شده است.

۲۰. گزینه ۳ درست است.

گزینه‌های ۱ و ۲ با access to the network ارتباطی ندارند. گزینه ۴ مستقیماً در متن اشاره شده است.

Lesson 9: References

مثال ۱: گزینه ۱ درست است.

مثال ۲: گزینه ۲ درست است.

19. **acquire** v.

to gain or come to possess

adj. acquisitive n. acquisition Syn. obtain

a- He acquired two rewards for his outstanding innovations in computer architecture.

b- The office's most recent acquisition was a new photocopier.

20. **assortment** n.

a variety

adj. assorted Syn. selection

a- You have an assortment of elective courses from which to choose.

b- He bought a box of assorted books at the book fair.

مثال ۳: گزینه ۳ درست است.

مثال ۴: گزینه ۴ درست است.

مثال ۵: گزینه ۳ درست است.

مثال ۶: گزینه ۳ درست است.

تمرین ۱:

۱. گزینه ۳ درست است.

باتوجه به ارتباط بین دو جمله متوالی بوضوح گزینه ۳ درست است.

تمرین ۲:

۲. گزینه ۱ درست است.

در این سؤال چون بین اسم و ضمیر فاصله زیادی افتاده است پاسخ دهی به آن سخت است. اسم آن *guises* است که عبارت *Each of these* فاصله بین اسم و ضمیر را کم کرده است.

تمرین ۳:

۳. گزینه ۴ درست است.

چون در جمله دوم دو ضمیر *former* و *latter* داریم بنابراین باید جمله ماقبل آن نیز شامل دو اسم باشد که اسم آخر آن خود شامل ترکیب دو اسم *public supply* و *distribution network* است.

تمرین ۴:

۴. گزینه ۱ درست است.

بدلیل استفاده از حرف تعریف *The* در *The industry* این صنعت باید قبلاً معرفی شده باشد. بنابراین گزینه ۱ درست است.

تمرین ۵:

۵. گزینه ۳ درست است.

نکته سؤال علاوه بر ضمیر، ارتباط بین پاراگراف‌های متوالی نیز است. پاراگراف اول به *IT portfolio management* و پاراگراف دوم به *financial portfolio management* اشاره دارد بنابراین گزینه ۳ درست است.

تمرین ۶:

۶. گزینه ۲ درست است.

ضمیر به *information technology governance* اشاره دارد.

b- Emotional problems are apt to damage personal relationships.

13. **involuntarily** *adv.*

in an unthinking manner; not chosen

adj. involuntary *Syn.* automatically

a- He involuntarily agreed to work overtime.

b- Reflexes are involuntary reactions to external stimuli.

14. **sustained** *adj.*

continuing in a constant way; remaining strong

v. sustain adj. sustenance *Syn.* consistent

a- Sustained rainfall is the only hope they have for relief from the drought.

b- The workstations can only sustain high data flow for seconds.

15. **tangible** *adj.*

real; that which can be felt

adv. tangibly n. tangibility *Syn.* concrete

a- The work of a teacher seldom produces tangible results until years after a student has graduated.

b- The solution to this problem can be tangibly demonstrated.

16. **conceivably** *adv.*

feasibly; believable

adj. conceivable v. conceive *Syn.* possibly

a- They could conceivably earn first place with their science project.

b- It is conceivable that humans will travel to distant planets one day.

17. **debilitating** *adj.*

weakening

v. debilitate n. debility *Syn.* weakening

a- The lack of investment savings has a debilitating effect on the economy.

b- The patient's debility restricted him to the room.

18. **deplete** *v.*

to use up; to reduce greatly

adj. depleted n. depletion *Syn.* consume

a- High potential depleted all carriers from junction.

b- The depletion layer was build under gate region.

تمرین ۷:

۷. گزینه ۴ درست است.

در جمله Iterative techniques are thus necessary to solve all these variables ضمیر these variables به اسامی جمله قبلی که در صورت سؤال هستند اشاره دارد.

تمرین ۸:

۸. گزینه ۳ درست است.

در جمله these در جمله It is to prevent these happenings به عبارات unstable, split up, blackout اشاره دارد. بنابراین ضمیر these ۳ درست است.

تمرین ۹:

۹. گزینه ۱ درست است.

در عبارت creating a 2D image, from which 3D data is generated which به 2D image اشاره دارد.

Lesson 10: Multiple choice strategies

تمرین ۱:

۱. گزینه ۴ کاملترین گزینه است.

تمرین ۲:

۲. گزینه‌های ۳ و ۴ برعکس هم هستند.

تمرین ۳:

۳. معنی گزینه‌ها بترتیب عبارتند از: پیش بینی شده- بخشیده شده (اهدا شده)- رشد داده شده- بهبود داده شده
معنی گزینه های ۳ و ۴ بهم نزدیک هستند. املاً توجه به واژه first که تاکید بر بار اول دارد، گزینه ۳ درست است.

تمرین ۴:

۴. گزینه های ۱ و ۳ و ۴ معنی بهبود تدریجی را دارند و بهم نزدیک هستند. اما گزینه ۲ حالت بهبود بصورت جهشی را دارد که با سه گزینه دیگر متفاوت بوده و جواب مورد نظر است.

تمرین ۵:

۵. سه گزینه انتهایی اسامی شرکت بوده و خاص هستند اما گزینه اول عام است.

تمرین ۶:

۶. گزینه های ۱ و ۲ و ۴ حالت منفی دارند اما گزینه ۳ مثبت است.

- a- She reacted impulsively to the loud noise.
b- Many shoppers buy items on impulse.

7. **subsequently** *adv.*

following; coming after something

adj. subsequent *Syn.* afterwards

- a- The public applauded the president's actions, and subsequently his ratings in the polls improved.
b- This report, and all subsequent reports, must be written in the appropriate style.

8. **controversial** *adj.*

something that causes disagreement or argument.

v. controversially n. controversy *Syn.* debatable

- a- The governor made a controversial decision to raise taxes.
b- The controversy was caused by the proposal to build an airport in the area.

9. **launch** *v.*

to cause something to begin

n. launch n. launching *Syn.* initiate

- a- The company launched a new program to attract more clients.
b- The launching time of the first university is not clear.

10. **spontaneous** *adj.*

unplanned; uncontrolled

adv. spontaneously n. spontaneity *Syn.* instinctive

- a- The spontaneous combustion inside the cylinder creates the power of the motor.
b- The hazard spontaneously happened.

11. **striking** *adj.*

drawing special attention to

adv. strikingly *Syn.* remarkable

- a- His striking proposal saved the company from bankruptcy.
b- That was a strikingly convincing argument that the speaker delivered.

12. **aptly** *adv.*

having a tendency to do something; likely

adj. apt n. aptness *Syn.* appropriately

- a- It was an aptly timed remark.

تمرین ۷:

۷. سه گزینه اول خاص بوده و گزینه ۴ عام است.

تمرین ۸:

۸. فقط گزینه ۲ خاص است (all defects do not) و سایر گزینه ها عام هستند (one hundred percent, every).

تمرین ۹:

۹. گزینه های ۱ و ۳ و ۴ دلیل بوده (because since,) و گزینه ۲ روش است (through).

b- He triumphed over all of his difficulties.

Lesson 10

1. **affordable** *adj.*

able to be done, usually refers to something you can do without damage or loss

adv. affordably v. afford *Syn.* economical

a- The new project is quite affordable.

b- He could afford the exam because of his aptitude and enthusiasm.

2. **peculiar** *adj.*

unusual; uncommon

adv. peculiarly n. Peculiarity *Syn.* strange

a- This plastic has a peculiar texture.

b- This eminent scientist has many peculiarities not analogous by any other.

3. **potent** *adj.*

very strong

Syn. powerful

a- He gave a potent speech at the convention.

b- Potent and versatile sensors are emerged these days.

4. **remarkable** *adj.*

worthy of mention; uncommon

adv. remarkably *Syn.* exceptional

a- The invention of the radio was a remarkable achievement.

b- The industrious student was remarkably calm before the exam.

5. **somewhat** *adj.*

a little

Syn. slight

a- They feel somewhat tired after the mile run.

b- Buying food at a convenience store can be somewhat expensive.

6. **impulsively** *adv.*

acting without thinking

adj. impulsive n. Impulse n. impulsiveness *Syn.* capriciously

PART A

Lesson 1

1. **access** (v, n)

adj: accessible syn: admission, right to use, right to entry
the method or possibility of approaching a place or person, or the right to use or look at something.

a- The only access to this computer is via its USB port.

b- Access of denied is an error prompt, when you do not have authorization to a network.

2. **dense** (adj) -r, -st

adv: densely n: denseness

thick; close together; difficult to go or see through

a- A dense material is needed to build the insulator.

b- There will be dense current in the emitter region.

c- The density of carriers can affect the amount of current.

3. **advocate** (v,n)

syn: supporter, sponsor, promoter

to speak in support of (an idea, course of action, etc.)

a- He advocates the return of conventional systems.

b- He's a strong advocate of state ownership of the new technology.

4. **assess** (v)

adj: assessable n: assessment

to judge or decide the amount, value, quality or importance of; to evaluate

a- Assessment of your proposal will take a while, I'm afraid.

b- Assessable income is the amount of money which is considered when calculating tax payments.

c- They assessed the cost of the new project at £1500.

5. **qualify** (v)

n: qualification adj: qualified

syn: become certified, be eligible, succeed

to (cause someone to) achieve or have the standard of skill, knowledge or ability that is necessary for doing or being something.

a- I'm not qualified to give advice on such matters.

b- I haven't got any qualifications in science.

c- Chris has just qualified as a doctor (= passed the exams necessary to become a doctor).

15. **compel** v.

to make something happen by necessity

adv. compellingly or force

adj. compelling Syn. obliged

a- The representatives were compelled to vote in favor of the legislation despite their personal opposition to it.b- The decision was made in a compelling manner.16. **formidable** adj.

difficult; causing worry or fear

adv. formidably Syn. overwhelming

a- Their formidable opponents gave no sign of weakness.17. **intrusive** adj.

the state of being inside or upon something when not desired to be there by others

adj. intrusively v. Intrude n. intrusion n. intruder

Syn. annoying

a- The intrusive bacteria caused his condition to worsen.b- The intrusion of the hazardous gas made it difficult to live in the house.18. **prone** adj.

likely to do something

Syn. inclined to

a- Most liquids are prone to contract when frozen.b- She is prone to study hard the night before her tests.19. **readily** adv.

willingly; easily

adj. ready v. ready n. readiness Syn. freely

a- Job opportunity is readily available in some part of the country.b- Her readiness to cooperate was an important factor in the investigation.20. **triumph** n.

a victory; a success

adv. triumphantly adj. triumphant adj. triumphal v. triumph

Syn. achievement

a- His career was characterized by one triumph after another.

6. **characterize** (v)

n: characterization syn: describe, illustrate, distinguish

To characterize something means to describe it by stating its main qualities.

a- In her essay, she characterizes the whole era as a period of radical change.

b- I/V characterization is one of the most important descriptions of an electrical element.

7. **peril** (n)

adj: perilous adv: perilously syn: danger, hazard, threat
great danger, or something that is very dangerous.

a- I never felt that my life was in peril.

b- Working with high voltage electricity is **fraught with peril** (= full of dangers).

c- Acids can be quite perilous.

8. **typical** (adj)

syn: usual, standard, conventional

a- Signal to noise ratio is a typical criterion in communication.

9. **scarce** (adj) -r, -st

n: scarcity adv: scarcely syn: rare, limited, inadequate
not easy to find or obtain.

a- Scarce resources should be used sensibly.

b- The scarcity of skilled engineers is worrying the government.

c- I could scarcely believe it when my manager fired me.

10. **annual** (adj)

adv: annually syn: once a year
happening once every year, or relating to a period of one year.

a- Companies publish annual reports to inform the public about the previous year's activities.

b- Your starting salary is £13 000 per annum and will be reviewed annually (= once every year).

11. **associate** (n,v)

adj: associated syn: partner, co-worker

To join or connect (people, things or ideas) together, or to be connected (with a person, organization or idea).

An associate is someone who is closely connected to another person as a companion, friend or business partner.

9. **archaic** *adj.*

very old, old-fashioned; no longer used

Syn. ancient

a- These archaic methods of fabrication must be brought up to date.

b- His speech was full of archaic expressions.

10. **hasten** *v.*

to cause to go faster; move forward more quickly

adv. *hastily* adj. *hasty* n. *Hastiness* *Syn.* accelerate

a- There is little doubt that poor medical treatment hastened her death.

b- You should not make important decisions hastily.

11. **intricate** *adj.*

having many parts; finely detailed

adv. *intricately* n. *Intricacy* *Syn.* complex

a- The intricate design of the circuit made it difficult to analysis.

b- I cannot begin to understand all of the intricacies of modern automobile motors.

12. **Poll** *n.*

questionnaire; a vote of public opinion

n. *polling* n. *pollster* *Syn.* survey

a- The poll indicated that conservation of the environment was the number one issue with college students.

b- The pollster asked the questions in a nonpartisan manner.

13. **predominant** *adj.*

the most noticeable or powerful element

adv. *predominantly* v. *Predominate* n. *Predominance* *Syn.* principal

a- The predominant export of the Middle East is petroleum.

b- Public opinion seems to be predominantly (= Most people are) in favor of holding a referendum.

14. **analogous** *adj.*

alike in some way

n. *analogy* *Syn.* similar to

a- The action of light waves is analogous to the action of sound waves.

b- The analogy between the behaviors of these machines is obvious.

- a- An associated professor will manage the project.
- b- The system's fault was not associated with its design.

12. **essential** (adj)

syn: vital, crucial, critical, necessary

- a- Maintaining standards is essential to our good reputation.
- b- Water is essential for/to living things.

13. **visible** (adj)

adv: visibly syn: observable, detectable, obvious ant: invisible
able to be seen

- a- The wires on the printed circuit is barely visible.
- b- There are few visible signs of degradation in the robot's performance.

14. **devise** (v)

syn: invent, create, contrive

to invent (a plan, system, object, etc.), esp. cleverly or imaginatively

- a- He's very good at devising software programs.
- b- The most important invention of the century, the transistor, was devised by Schockley, Bardeen and Bratten in Bell Lab.

15. **eliminate** (v)

n: elimination syn: get rid of, abolish, eradicate
to remove or take away.

- a- The silicon wafer should be eliminated from any impurities.
- b- We found the answer by a **process of elimination** (= by removing from several possible answers the ones which were unlikely to be correct until only one is left).

16. **utilize** (v)

n: utilization adj: utilizable syn: use, exploit, develop, consume, make use of

- a- At the development phase it was possible to utilize (= use) earlier research which had been performed.
- b- Sensible utilization of the world's resources must be given priority.

17. **descend** (v)

n: descent syn: go down, come down ant: ascend
to go or come down (something)

- a- (figurative) The situation rapidly descended into (= became worse so that it was) chaos.
- b- The system performance descent is rapid.

- a- She has the notion that she wants to become an architect.
b- Some outlandish notions about the origin of the solar system have been disproved.

3. **accentuate** v.

to highlight; to give more importance to

adj. accentuated n. Accentuation Syn. emphasize

- a- The supervisor accentuated her role in project success.

4. **Innovative** adj.

something newly introduced; creative

n. innovator n. Innovation Syn. creative

- a- This innovative project is worthy of support.
b- There have been many innovations in the field of genetic engineering.

5. **outlandish** adj.

strange and unpleasant; beyond accepted norms

adv. outlandishly Syn. bizarre

- a- His outlandish ideas demonstrated his creativity.
b- He outlandishly solved the problem.

6. **partially** adv.

a part of the whole; incomplete

adv. partly adj. Partial n. Part Syn. somewhat

- a- The clerk was only partially responsible for the error.
b- The business scheme was only a partial success.

7. **decline** v.

to move from good to bad, or from much to little, to refuse

n. decline Syn. decrease

- a- The systems performance has declined.
b- Serious communicable diseases are on the decline in most parts of the world.

8. **plentiful** adj.

more than sufficient

adv. plentifully n. Plenty Syn. abundant

- a- I always make sure I have a plentiful supply of things to amuse students in the class.
b- A balanced diet normally provides plenty of the necessary vitamins.

18. **enormous** (adj)

adv: enormously n: enormousness syn: huge, vast, gigantic, massive ant: tiny
extremely large

a- It gives me enormous pleasure to welcome Professor Hall.

b- Displacing is an enormously long process in VLSI.

19. **predict** (v)

adj: predictable adv: predictably n: prediction

Syn: forecast, foresee, foretell, guess

to say that (an event or action) will happen in the future, esp. as a result of knowledge or experience

a- Who could have predicted **that** within ten years he'd be in charge of the whole company?

b- The new project appears at predictable times.

c- We are not yet able to **make** a prediction **about** when the next earthquake will happen.

20. **vanish** (v)

adj: vanished, vanishing syn: disappear, evaporate ant: appear

to disappear or stop being present or existing, esp. in a sudden, surprising way

a- Vacuum tubes were vanished in the computer technology.

b- The old building on the road is a distant reminder of a vanished empire.

Lesson 21. **majority** (n)

syn: bulk, greater part

the larger number or part of something

a- In n-type semiconductor, electrons are in the/a majority (= there are more than holes).

2. **assemble** (v)

n: assembler, assembly syn: bring together, pull together ant: disband

to join or bring (parts) together in a single group or place, or (of parts) to come together like this.

a- Robert Noyce was the first man who assembled more than one transistor into a single chip.

b- You can be close to the hardware with assembly language.

3. **explore** (v)

n: exploration, explorer adj: exploratory syn: discover, travel around, investigate
to search and discover (about)

a- Some people think it's wrong to spend money on exploring space.

- a- You should handle your duty by any means available to you.
b- The most convenient means of communicating with someone is by phone.

17. **preconception** *n.*

an opinion formed in advance without experience or knowledge of something

adj. preconceived v. preconceive Syn. bias

- a- It is difficult to overcome preconceptions if we are not open to new ideas.
b- His preconceived notions about his job disappeared after he visited it.

18. **robust** *adj.*

showing good health; in good shape

adv. robustly n. robustness Syn. energetic

- a- The robust economy is expected to continue growing quickly.
b- The new product is selling robustly.

19. **steady** *adj.*

firm; in a fixed position; without change; reliable, dependable

adv. steadily v. steady n. steadiness Syn. constant

- a- Steady growth is expected for companies involved in genetic engineering.
b- The secretary has steadily earned respect for her work.

20. **swift** *adj.*

quick adv. swiftly n. swiftness Syn. fast

- a- Inventors are usually swift thinkers.
b- They swiftly agreed with the conclusion of the report.

Lesson 9

1. **fabricate** *v.*

to make up, to invent or produce

adj. fabricated n. Fabrication Syn. invent

- a- This company can fabricate various range of products.
b- IC fabrication is a fruitful business.

2. **notion** *n.*

an idea, belief, or opinion

Syn. concept

b- Let's explore this question/issue/topic/idea more fully (= examine it carefully in order to discover more about it).

c- You can search the web with Internet Explorer.

4. **topic** (n)

adj: topical syn: theme, subject, issue

a subject which is discussed, written about or studied

a- Our discussion ranged over various topics.

5. **debate** (n,v)

syn: discuss, argue, contest

serious discussion of a subject in which many people take part

a- Education is the current focus of public debate.

b- We debated (= considered) whether to take the XML or HTML.

6. **probe** (v,n)

adj: probing syn: search, explore, query

to try to discover information that other people do not want you to know, by asking questions in an indirect careful way.

a- The article probes (= tries to describe and explain) the effect of software acquisition on the company's income.

b- In their official probe into malpractice, federal officials have found evidence of corruption within the company.

7. **reform** (v,n)

n: reformation, reformer adj: reformed syn: improvement, modification
(to make) an improvement, esp. by changing a person's behaviors or the structure of something.

a- The government is committed to carrying out a program of social reform.

b- A reformed alcoholic/criminal (= someone who was previously an alcoholic/criminal, but is not now).

8. **approach** (v,n)

adj: approachable syn: move toward, come near, method ant: retreat
to come near or nearer to (something or someone) in space, time, quality or amount

a- Many things in the engineering world have changed at the approach of computers.

b- This approach has more advantage than the other method.

9. **detect** (v)

adj: detectable n: detection syn: notice, distinguish, identify

10. documented *adj.*

proven with written evidence

adj. documentary *v.* document *n.* documentation *Syn.* proven

a- He had documented proof that the bank had made an error.

b- The car's documentation was in order.

11. inordinate *adj.*

a large amount or quality; more than reasonable

adv. inordinately *Syn.* excessive

a- The airlines had to cancel an inordinate number of flights due to the fog.

12. involve *v.*

to become concerned with or connected to

adj. involved *n.* involvement *Syn.* include

a- She involved herself in many activities at the university.

b- His involvement in politics is well documented.

13. absurd *adj.*

clearly false, without reason

adv. absurdly *n.* absurdity *Syn.* ridiculous

a- Confidentially, I think his suggestion is absurd.

b- They are absurdly irrational about the issue.

14. allocation *n.*

a share; a part set aside for a special purpose; an assignment of portions

adj. allocated *v.* allocate *Syn.* distribution

a- You should be careful about time allocation in your presentation.

b- Allocating memory space in a computer is a difficult task.

15. fallacious *adj.*

having errors

adv. fallaciously *n.* fallacy *Syn.* incorrect

a- Her fallacious argument could not be defended.

b- It is a fallacy to think that money will bring you happiness

16. means *n.*

Ways *Syn.* methods

to notice (something that is partly hidden or not clear) or to discover (something) esp. using a special method

- a- Early detection of the cancer improves the chances of successful treatment.
- b- The drug is detectable in the body for up to three months after it has been taken.
- c- Some sounds cannot be detected by the human ear.

10. defect

n: defection adj: defective syn: fault, flaw, imperfection

a fault, problem or lack in something or someone that spoils them or causes them not to work correctly.

- a- Recent improvements in science and technology have resulted in large-scale defection in the previous experiments.
- b- It's a **character defect** in her that she can't ever accept that she's in the wrong.

11. employee (n)

syn: worker, member of staff

An employee is someone who is paid for working for someone else.

- a- The number of employees in the company has increased tenfold over the past decade.
- b- The technology employees a process that does not involve any chemical changes.

12. neglect (v,n)

adj: neglected, neglectful syn: abandon, ignore, avoid

to give not enough care or attention to (people or things that are your responsibility)

- a- Over the years the inventory and maintenance have fallen into a state of neglect.
- b- I'm sure my boss thinks I've been neglectful of my duties recently.

13. deceive (v)

n: deceiver syn: trick, cheat, defraud

to persuade (someone) that something false is the truth; to keep the truth hidden from (someone) for your own advantage

- a- Money will not bring happiness; we are deceiving ourselves.
- b- The sound of the door closing deceived me **into** thinking they had gone out.

14. persuade (v)

n: persuasion adj: persuasive adv: persuasively

syn: convince, influence

to make (someone) do or believe something by giving them a good reason to do it or by talking to them and making them believe it

- a- It is very important for managers to persuade their financial supporters.

- a- The reporters had inadvertently failed to include the name of one of the dignitaries.
- b- His inadvertent calculation caused him to derive the wrong answer.

4. **inevitable** *adj.*

something that cannot be prevented from happening

adv. inevitably n. inevitability *Syn.* unavoidable

- a- When two waves interfere each other, noisy signals are inevitable.
- b- The inevitability of the outcome made the challenge less exciting.

5. **infancy** *n.*

in the beginning stages of development

adj. infantile n. Infant *Syn.* beginning

- a- The new theory is in its infancy and will be thoroughly tested by its critics.
- b- Certain head injuries can cause infantile behavior.

6. **retrieve** *v.*

to find and bring back

adj. retrieve n. Retrieval *Syn.* recover

- a- Will Detroit retrieve its status as the car manufacturing center of the world?
- b- This computerized information retrieval system is the most up-to-date system available.

7. **unlikely** *adj.*

not probable *Syn.* doubtful

- a- It is unlikely that he will want to attend the conference.

8. **unwarranted** *adj.*

without good reason or cause; inappropriate

Syn. unjustified

- a- His negative reaction was unwarranted.
- b- The company director claimed the criticism was unwarranted and unjust.

9. **delighted** *adj.*

to be satisfied; very happy

adv. delightfully adj. Delightful n. Delight *Syn.* elated

- a- He was delighted with the result of the experiment.
- b- It was a delightful afternoon.

b- The power of persuasion (=ability to persuade people) is very important for politicians.

15. **undoubtedly** (adv)

adj: undoubted syn: certainly, undeniably, without doubt
not questioned or doubted; accepted as the truth

a- Of course she's good at her job - that is undoubtedly true.

b- A Nobel price winner is the undoubted inventor of the year.

16. **client** (n)

syn: customer, user, purchaser ant: consultant
a person who receives services; a customer

a- Client and server protocol is used frequently in computer's network.

b- We always aim to give our clients personal attention.

17. **comprehensive** (adj)

adv: comprehensively syn: complete, full, widespread ant: sketchy
complete and including everything that is necessary

a- He has written a **fully comprehensive** user manual.

b- The plan has been comprehensively rejected.

18. **postpone** (v)

n: postponement syn: put off, delay, suspend ant: continue
to delay (an event), esp. arranging for it to happen at a later date or time

a- The project leader decided to postpone the new proposal until the autumn.

b- They accepted the need for postponement.

19. **consent** (v,n)

syn: permission, approval, authority ant: refusal
permission or agreement

a- They can't publish your name without your consent.

b- Your supervisor should consent to your thesis before you can start it.

20. **massive** (adj)

adv: massively n: massiveness syn: huge, gigantic, great
very large in size, amount or number

a- With the advent of internet we can have access to a massive information superhighway.

b- They rejected a massively (= very) ambitious project.

18. halt v.

to stop or discontinue

adv. haltingly adj. Halting n. Halt Syn. stop

a- Computer was halted due to innumerable errors.

b- The supervisor put a halt to the tardiness of the employees.

19. handle v.

to deal with or control

n. handle Syn. manage

a- They handled themselves very well given the circumstances.

b- The computer's handling of the massive data was impressive.

20. substantial adj.

important; noticeable

adv. substantially adj. Substantive Syn. significant

a- The discovery of transistor was a substantial technical achievement.

b- This substantive article will change your opinion.

Lesson 8

1. conscientious adj.

showing serious purpose; one who works carefully and with enthusiasm

adv. conscientiously Syn. meticulous

a- She is a conscientious representative of the student body.

b- They approached the task conscientiously.

2. encompass v.

to surround completely; to envelop

Syn. include

a- Her plan of the study encompasses every aspect of computer science.

b- The course encompasses all the requirements.

3. inadvertently adv.

by accident; without paying attention; unexpectedly

adj. inadvertent

Syn. carelessly

Lesson 3

1. preserve

syn: conserve, save ant: destroy

to keep (something) as it is, esp. in order to prevent it from decaying or being damaged or destroyed

a- This transformation preserves the height to width ratio.

2. denounce (v)

n: denunciation syn: condemn, criticize, deplore ant: support

to criticize strongly and publicly

a- The firm's economic policy has been denounced on all sides.

b- The minister's speech contained a strong denunciation.

3. unique (adj)

Adv: uniquely n: uniqueness

syn: single, inimitable, rare ant: common

being the only existing one of its type or, more generally, unusual or special in some way

a- IP address is a unique number.

b- Professor Smith, he would seem uniquely qualified to play the role of the chairman.

4. unforeseen

syn: unexpected, unanticipated, unpredicted, sudden

a- Due to unforeseen circumstances the cost of the improvements has raised by twenty per cent.

5. exaggerate (v)

adv: exaggeratedly n: exaggeration

syn: overstate, embellish ant: understate

to make (something) seem larger, more important, better or worse than it really is

a- It's not an exaggeration to say that her work has saved lives.

b- The new project's success has been greatly exaggerated.

6. conventional

n: conventionality syn: conservative, usual, normal, typical, traditional

ant: unconventional

a- conventional behavior/attitudes/opinions/clothes

b- Conventional radio systems like AM and FM are still in use.

c- To become integrated into a society, you must learn the conventions of that society.

12. **exhaust** v.

to use completely; to expend all energy

adv. exhaustively adj. exhaustive adj. exhausting

adj. Exhausted n. Exhaustion Syn. deplete

a- The battery exhausted its energy in 50 minutes.

b- He exhaustive report was acclaimed by everyone.

13. **Facet** n.

element or component.

adj. Faceted Syn. aspect

a- The proposal had many beneficial facets.

b- It was a multi faceted problem that challenged the entire student body.

14. **ample** adj.

more than enough

adv. amply Syn. sufficient

a- There is ample evidence that due to lack of financial support, our firm can not overcome obstacles.

b- She was amply paid for the work she completed.

15. **indiscriminate** adj.

not chosen carefully; unplanned

adv. indiscriminately Syn. arbitrary

a- The indiscriminate arrangement of the products made the store confusing.

b- The book's chapters seem to be organized indiscriminately.

16. **withstand** v.

to fight without surrender; to persist

Syn. survive

a- She cannot withstand the pressures of her job.

b- The insulator must withstand even the high voltage.

17. **gain** n.

to obtain something needed or useful; to increase the amount of something

adj. gainful n. gain Syn. attain

a- He gained a lot of experience working as a volunteer.

b- His gain in knowledge was impressive.

c- Voltage gain can be increased through bypassing the emitter's resistor.

7. mediocre

n: mediocrity syn: middling, average, second-rate, moderate ant: excellent
not very good; not good enough

- a- The film's plot is predictable, the dialogue is second-rate, and the acting is mediocre.
- b- This is a mediocre research report.
- c- The mediocrity of his work was disappointing.

8. variety (n)

syn: diversity, mixture ant: likeness
the characteristic of frequently changing and being different

- a- Work on the production line is monotonous and lacks variety.

9. valid (adj)

v: validate syn: legal, official, legitimate ant: invalid
based on truth or reason; able to be accepted

- a- There is still no valid research/evidence/data that supports your theory.
- b- The data is entered on to a computer which validates it.

10. prominent (adj)

adv: prominently n: prominence
syn: famous, well-known, major, outstanding, salient
very noticeable, well known or important

- a- Most of the papers give prominence to (= put in a noticeable position) the same topic.
- b- The universities should be playing a more prominent role in promoting educational standards.

11. reluctant (adj)

adv: reluctantly syn: unwilling, hesitant, unenthusiastic ant: eager
not very willing to do something and therefore slow to do it

- a- the project was abandoned due to reluctant managers.
- b- The losers reluctantly accepted defeat.

12. conclude (v)

n: conclusion syn: bring to a close, terminate, finish off ant: start
to end (a speech, meeting or piece of writing), or to judge after some consideration

- a- Did you come to/reach/draw any conclusions (= make any decisions) at the meeting this morning?
- b- The jury concluded from the evidence that the defendant was innocent.

13. autonomous (adj)

adv. autonomously Syn. independent
by itself, with no association

- a- A robot is an autonomous machine which should change its action according to its environment.
- b- Although working closely in a group, all members must work autonomously.

b- The unstable chemical reacted erratically.

6. **prevalent** *adj.*

existing widely or commonly.

n. prevalence *Syn.* Commonplace, widespread

a- Studying two majors concurrently is prevalent in some countries.

b- There is a prevalence of disease where poor sanitation conditions exist.

7. **conspicuously** *adv.*

attracting attention

adj. conspicuous *Syn.* noticeably

a- His name was conspicuously absent from the list of winners.

b- The attorneys were conspicuous for their aggressive manner in the courtroom.

8. **endorse** *v.*

to express approval

n. endorsement *Syn.* support

a- The union endorsed the new contract.

b- The president's endorsement of the project guaranteed its funding.

9. **shift** *n.*

change in position or direction.

adj. shifting *v.* Shift *adj.* Shifty *Syn.* Switch, alter, move

a- China shifts its policy from nationalism to international economy.

b- Earthquakes are caused by shifting in layers of earth along faults.

10. **dignitary** *n.*

a very important or famous person, usually associated with a high position in government.

Syn. notable

a- All of the high ranking dignitaries attended the economic summit.

11. **elude** *v.*

to escape in a tricky way

adj. elusive *n.* Elusiveness *Syn.* evade

a- The criminal has eluded the police for months.

b- Success has been elusive for the team.

14. **lack** (v,n)

Syn: be short of

to not have or not have enough of (something that is needed or wanted)

a- We are lacking three members of staff due to illness.

b- Her only problem is lack of confidence.

15. **disruptive** (adj.)

causing confusion and interruption

v. disrupt Syn. Disturbing n. disruption adv. disruptively

a- Frequent questions during lectures can be disruptive.

b- Many power outage can have a disruption effect in network service.

16. **confirm** (v)

adj: confirmed n: confirmation syn: Prove

to make certain, given support

a- The director confirmed that the meeting would be on the tenth.

b- We have just received confirmation of your paper submission for the conference.

17. **convenient** (adj.)

adv: conveniently n: convenience Syn. practical

easy to reach, near; suitable to one's needs

a- The student union is convenient to the physical sciences building.

b- For the convenience of the students, the library is located in a central location.

18. **arbitrary** (adj.)

Syn: random, subjective, illogical ant: logical

based on chance rather than being planned or based on reason, or (disapproving) based on personal power without considering people's wishes

a- Before working with this software unlike arbitrary parameters, you should set mandatory parameters.

19. **elaborate** (v)

syn: explain, expand, enlarge

to add more information to or explain something that you have said

a- Introduce your main points to begin with and elaborate on them later in your essay.

20. **challenge** (n,v)

adj: challenging syn: argue with, oppose

an invitation to compete or take part, esp. in a game or argument

a- Their objections challenged me to think of better arguments in support of my suggestion.

b- This is the most challenging book that I've ever read.

20. **bear** (v.)

to produce, to carry; to show; to endure.

adj. bearably adj. bearable Syn. yield

a- This firm bears many software applications in a year.

b- Although stock prices declined, losses have been bearable for most investors.

Lesson 7

1. **akin**

similar; having some of the same qualities

Syn. analogous

a- They speak a language akin to French.

2. **intrinsic** (adj.)

belonging to the essential nature of something.

adv. intrinsically

Syn. inherent

a- An intrinsic semiconductor is a material which has both electrons and holes in normal condition.

b- Some students are intrinsically talented.

3. **vigorous** (adj.)

powerful, full of action.

adv. Vigorously n. Vigor Syn. strong

a- His vigorous defense of the issues impressed everyone.

b- He approached his work with vigor.

4. **disperse** v.

to cause to move in many different directions

adj. dispersed Syn. Circulate, scatter

a- The high winds and rain dispersed the crowd.

b- The friends were widely dispersed when they left university, but they still meet occasionally.

5. **erratic** adj.

no regular pattern in thinking or movement; changeable without reason.

adv. erratically Syn. inconsistent, unpredictable, irregular

a- The student's marks have an erratic qualify, some being excellent, and others mediocre.

Lesson 4

1. broaden (v)

n: broadness adj: broad syn: enlarge

To make larger or greater

a- education will broaden your opportunities to land a good job.

b- In our communication project we are dealing with broad band signals.

2. tendency (n)

V: tend syn: propensity, penchant, affinity

If you have a particular tendency, you are likely to behave in that way or like that particular thing.

a- His tendency to exaggerate is well known.

b- He's always had a tendency towards (= He has always liked) difficult circumstances.

c- She tends not to go away in the summer.

3. underestimate (v)

n: underestimate syn: undervalue, miscalculate, take too lightly ant: overestimate

to fail to guess or understand the real cost, size, difficulty, etc. of (something), or to fail to understand how strong, skilful, intelligent or determined (someone, esp. a competitor) is

a- Never underestimate your enemy!

b- Clearly £25 was a serious underestimate.

4. numerous (adj)

syn: many, frequent, abundant, various, plentiful ant: few

a- We have discussed these plans on numerous occasions.

b- She is the author of three books and numerous articles.

5. flexible (adj)

n: flexibility syn: adaptable, compliant ant: rigid

able to change or be changed easily according to the situation

a- My manager is not prepared to be flexible about the system objections.

b- The advantage of this system is its flexibility.

6. evidence (n)

Adj: evidenced, evident adv: evidently

syn: proof, confirmation, facts, verification

one or more reasons for believing that something is or is not true

- b- The enrollment fees increased drastically over past few years.
c- You should enroll before starting of the new term.

14. donate (v)

n: donation, donor Syn: give, provide, contribute
to give without wanting anything in exchange.

- a- Computer manufacturers donate equipments to colleges and universities as a tax-free condition.
b- In n-type semiconductor, donor impurities share their free electrons with others.

15. apex (n)

Syn: peak, summit, acme, zenith

- a- He reached the apex of his career during that period.

16. interference (n)

v. interfere adj. interfering

Syn: intrusion, intervention

to involve yourself in matters which are connected with other people when your involvement is neither wanted nor helpful.

- a- She seems to regard any advice or help from me as interference.
b- Radio stations with adjacent frequency bands may interfere each other.

17. alternative (n)

adj. alternate v. alternate adv. alternately

Syn: option, choice

to happen or exist one after the other repeatedly.

- a- In some countries large central generators provide electric power as the only alternative.

18. viable (adj.)

Syn: workable, feasible, practical

- a- Do you think solar power is really a viable alternative as a way of providing heat?
b- Utilizing electric machines is the only viable solution for the air pollution problem.

19. relinquish (v)

to give up control.

n. relinquishment Syn. abdicate

- a- The troubled executive relinquished his control of the company.
b- The relinquishment of his claim to the building will allow the building to be sold.

- a- He was evidently upset by supervisor's advice.
- b- It is evident **that** our team manager has a comprehensive point of view.
- c- We have found no evidence of system degradation.

7. **trend** (n)

Syn: tendency, inclination

a general development or change in a situation or in the way that people are behaving.

- a- Surveys show a trend away from general-purpose systems towards tailor-made systems.

8. **vision** (n)

syn: foresight, imagination

the ability to see or an imagined mental image of something

- a- Machine vision is one of the associated majors with image processing.

9. **hesitate** (v)

n: hesitation adj: hesitant syn: be uncertain, vacillate

to pause before you do or say something, often because you are uncertain or nervous about it.

- a- If you need anything, don't hesitate to call me.
- b- After a slight hesitation, she began to speak.
- c- You seemed a bit hesitant **about** recommending that university; is something wrong with it?

10. **conflict** (n,v)

adj: conflicting syn: disagreement, controversy

ant: concord, convergence

an active disagreement between people with opposing opinions or principles.

- a- There was a lot of conflict **between** parameters that should be optimized.
- b- If the two sides conflict with each other again, it will be disastrous for party unity.
- c- conflicting opinions/ideas/advice

11. **commence** (v)

n: commencement syn: start, originate, begin, embark ant: terminate

to begin (something)

- a- When you've finished your talking I shall commence!
- b- Before the commencement of transistors, vacuum tubes were in wide use.

12. **albeit** conj.

in spite of the facts, regardless of the fact

Syn. Although

- a- New technologies may degrade our society.
- b- It is so degrading to ask for money.
- c- There is no evidence of system degradation.

8. **surmount** (v)

Syn: overcome, conquer, defeat

to deal successfully with a difficulty or problem.

- a- The project has a shortcoming that will soon be surmounted.

9. **testify** (v)

to speak seriously about something, esp. in a court of law; to give or provide evidence.

syn: confirm, swear

- a- anyone who has ever used speech recognition algorithms can testify that they are fancy.
- b- No one expected him to testify against his former employer.

10. **conspicuous** (adj)

Adv: conspicuously n: conspicuousness

Syn: obvious, noticeable

very noticeable; tending to attract attention, often in a way that is not wanted.

- a- Compactness is the most conspicuous quality of MP3 format.

11. **feature** (n)

Syn: trait, attribute, characteristic

an esp. typical quality or important part.

- a- Feature extraction is one of the sections in pattern recognition.
- b- One of the key features of the invented system is its ability to anticipate.

12. **curriculum** (n)

Syn: syllabus, set of courses

the group of subjects studied in a school, college etc., or a particular course of study in one subject

- a- All universities in Iran follow a unique national curriculum.
- b- Computer courses should be given higher priority in school's curriculum.

13. **enrollment** (n)

V: enroll

To become a member of a group, a student on a course, etc.

- a- The aim of school advertisement is to increase enrollment.

- a- His trip was successful, albeit tiring.
- b- Albeit difficult at times, learning another programming language is rewarding.

13. **contemporary** *adj.*

modern, up-to-date; also a person living at the same time as another person

n. contemporary *Syn.* current

- a- Contemporary electronics systems can repair themselves without any intervention.
- b- Cervantes was a contemporary of Shakespeare.

14. **worthwhile** *adj.*

value in doing something *Syn.* Rewarding

- a- Learning vocabulary is a worthwhile task for your exam.
- b- It's worthwhile to prepare for the master degree.

15. **alter** *v.*

to change or make different

v. altered n. alteration adj. alterable adv. alterably *Syn.* Modify

- a- All parameters should be calculated in each alteration of the signal.
- b- You should not alter your plans to enter a good university to continue your education.

16. **compromise** (v.n)

(to reach) an agreement in an argument in which the people involved reduce their demands or change their opinion in order to agree

syn. Trade-off

- a- There is a compromise **between** accuracy and speed in the design of relays.
- b- It is hoped that a compromise will be **reached/agreed/arrived at/worked out** in today's talks.

17. **drawback** (n)

a disadvantage or problem; the negative part of a situation

syn: weakness, shortcoming, disadvantage

- a- One of the drawbacks **of** this system is its high power consumption.

18. **hazy** (adj) -ier, -iest

Adv: hazily *Syn:* unclear, confused, indistinct

- a- a hazy thought/picture.

adv. intensively *Syn.* heighten

- a- The importance of the test will sometimes intensify the nervousness of the students.
- b- Current intensity is proportional to the potential's difference.

2. intolerable *adj.* difficult or painful to experience, not able to accept different ways of thought or behavior

n. intolerance adv. intolerably adv. intolerantly
adj. intolerant *Syn.* unbearable

- a- Any opposition to the rules is intolerable.
- b- His boss was intolerant of his tardiness.

3. elicit *v.* to get the facts, to draw out, to evoke

n. elicitation *Syn.* extract

- a- A scientist should elicit all the facts necessary to prove his theory.
- b- Elicitation of the truth can be difficult at times.

4.concern (*v,n*)

Adj: concerned adv: concernedly *syn:* worry, alarm
to cause anxiety to.

- a-The state of my father's health concerns us greatly.
- b- I'm a bit concerned about/for your health.

5-circumstance

Syn: Condition

- a- We discussed the new proposal in numerous circumstances.

6. imperative (*adj,n*)

Syn: very important, vital, necessary
extremely important or urgent; needing to be done or given attention immediately.

- a- It's imperative to act now before the problem gets really serious.
- b- Getting the unemployed back to work, said the minister, is a moral imperative.

7. degrade (*v*)

Adj: degrading n: degradation *syn:* corrupt, humiliate
to cause (people) to feel that they or other people are worthless and do not have the respect or good opinion of others.

- b- I'm very hazy about what happened after we hit the other car.
 c- She only hazily remembered her last visit twenty years ago.

19. **distribute** (v.)

to divide among people or to give out

n. distribution Syn. Dispense

- a- Many publishers distribute their newspapers directly to homes in their area.
 b- Distribution systems bring electricity from power generation plants to the customers.

20. **ongoing** adj.

Continuing Syn. Current

- a- The tutoring project is an ongoing program in our university.
 b- Maintaining roads is an ongoing job.

Lesson 5

1. **duplicate** (v,n,adj)

n: duplication

to make an exact copy of (something)

- a- Lack of communication between the two groups led to a wasteful duplication of effort.
 b- I lost the original form so they sent me a duplicate.
 c- The thieves were equipped with duplicate keys to regenerate the coded image.

2. **bewildered** (adj)

V: bewilder adj: bewildering n: bewilderment

Syn: confused, puzzled, baffled

to confuse (someone) by being difficult to understand or by not being familiar.

- a- She was completely bewildered by his critical remarks (= She did not understand why he had criticized her).
 b- He was in a complete state of bewilderment and did not know what to do next.

3. **obstacle** n.

Syn. Blockage, complication

something that blocks you so that movement, going forward or action are prevented or made more difficult

- a- Eventually they overcame all the obstacles and their firm was very successful.
 b- Heat transform is a major obstacle in the way of IC manufacturing.

(knowledge obtained from) an ability to understand or know something immediately without needing to think about it, learn it or discover it by using reason.

- a- Sometimes difficult problems can be solved by acting intuitively rather than thinking logically about it.
- b- Men are often regarded as less intuitive than women.

16- **coordinate** v.

adj: coordinated n: coordinates

syn: synchronize, match

to match; to look attractive together.

- a- Team manager should coordinate all activities of the team.
- b- You look very coordinated today (= Your clothes match in color and style).

17- **familiar** adj.

n: familiarity / v: familiarize

syn: recognizable, known, common

easy to recognize because experienced previously. To be familiar with something is to know it well.

- a- A good student is expected to be familiar with computer.

18- **feasible** adj.

n: feasibility syn: possible, practicable, realistic

able to be made, done or achieved; possible or reasonable.

- a- The jury is making/doing a feasibility study of/on your proposals.
- b- Now that we have the extra resources, the scheme seems politically/financially/technically feasible.

19- **framework** n.

a supporting structure around which something can be built.

- a- The chair has a bamboo framework.
- b- Any changes that you make must fit into the existing framework.

20- **infrastructure** n.

The basic structure on which an organization or system is built and which makes it able to work.

- a- The war has badly damaged the country's infrastructure, from electricity plants and generators to roads and bridges.

Lesson 6

1. **intensify** v. to make stronger in feeling or quality

n. intensity adj. Intense adj. Intensive adv. intensely

4. celebrated *adj.*

acclaimed, well-known, and popular

Syn. renown

a- The celebrated inventor will give a speech this weekend.

b- Supercomputers are celebrated for their computational power.

5. stagnation *n.*

v: stagnate adj: stagy

a- The electronics industry is showing signs of stagnating after 15 years of tremendous growth.

b- If the economic stagnation in many countries is to be overcome, trade needs to be increased between industrial and developing nations.

6. revise *v*

adj: revised syn: modify, adjust, improve, change

to look again at (an idea, a piece of writing, etc.) in order to make corrections or improvements to it

a- His helpfulness today has made me revise my original opinion/impression of him.

b- The researchers made many corrections to the revised edition.

7. casual *adj.*

adv: casually

not regular or fixed; temporary

a- Are you employed permanently or on a casual basis?

8. collaboration *n.*

adj: collaborative n: collaborator v: collaborate

to work with someone else for a special purpose

a- Two writers collaborated on the script for the film.

b- This is a new production by Andrew Davies and collaborators.

9. manipulate *v.*

n: manipulation syn: influence, control, operate, employ

to control (something) using the hands

a- The wheelchair is designed so that it is easy to manipulate.

10. ban *v, n.*

Syn: forbid, prohibit, interdict

to forbid, esp. officially.

- a- Smoking is banned in this restaurant.
b- There should be a ban on talking and eating loudly in cinemas.

11. appropriate adj.

Adv: appropriately n: appropriateness
syn: suitable, fitting ant: inappropriate
suitable or right for a particular situation or occasion.

- a- It wouldn't be appropriate for me to comment.
b- Nanotechnology has been appropriately used in numerous applications.

12. emerge v.

n: emergence adj: emergent, emerging
syn: come into view, become apparent, come out
to appear by coming out of something or out from behind something.

- a- Transistor was emerged in 1948.
b- The emergence of small Japanese cars in the 1970s challenged the US and European manufacturers in their own countries.

13. widespread adj.

Syn: extensive, general, common ant: limited
existing or happening in many places and/or among many people.
a- A single flaw can have a widespread effect to the overall system.

14. relentless adj.

Adv: relentlessly Syn: persistent, insistent, uncompromising
continuing in a severe or determined way.

- a- He believes that the relentless push for economic growth is deeply damaging to the environment.
b- Demand for places in the college has been rising relentlessly over the past few years.

14. motivation n.

v: motivate adj: motivated

- a- Our staff are hard-working and highly motivated (= enthusiastic).
b- The motivation for the decision is the desire to improve our service to our customers.

15. intuitive adj.

n: intuition adv: intuitively