

### Passage 31

The number of women directors appointed to corporate boards in the United States has increased dramatically, but the ratio of female to male directors remains low. Although pressure to recruit women directors, unlike that to employ women in the general work force, does not derive from legislation, it is nevertheless real.

Although small companies were the first to have women directors, large corporations currently have a higher percentage of women on their boards. When the chairs of these large corporations began recruiting women to serve on boards, they initially sought women who were chief executive officers (CEO's) of large corporations. However, such women CEO's are still rare. In addition, the ideal of six CEO's (female or male) serving on the board of each of the largest corporations is realizable only if every CEO serves on six boards. This raises the specter of director over-commitment and the resultant dilution of contribution. Consequently, the chairs next sought women in business who had the equivalent of CEO experience. However, since it is only recently that large numbers of women have begun to rise in management, the chairs began to recruit women of high achievement outside the business world. Many such women are well known for their contributions in government, education, and the nonprofit sector. The fact that the women from these sectors who were appointed were often acquaintances of the boards' chairs seems quite reasonable: chairs have always considered it important for directors to interact comfortably in the boardroom.

Although many successful women from outside the business world are unknown to corporate leaders, these women are particularly qualified to serve on boards because of the changing nature of corporations. Today a company's ability to be responsive to the concerns of the community and the environment can influence that company's growth and survival. Women are uniquely positioned to be responsive to some of these concerns. Although conditions have changed, it should be remembered that most directors of both sexes are over fifty years old. Women of that generation were often encouraged to direct their attention toward efforts to improve the community. This fact is reflected in the career development of most of the outstandingly successful women of the generation now in their fifties, who currently serve on corporate boards: 25 percent are in education and 22 percent are in government, law, and the nonprofit sector.

One organization of women directors is helping business become more responsive to the changing needs of society by raising the level of corporate awareness about social issues, such as problems with the economy, government regulation, the aging population, and the environment. This organization also serves as a resource center of information on accomplished women who are potential candidates for corporate boards.

1. The author of the passage would be most likely to agree with which of the following statements about achievement of the "ideal" mentioned in line 14?
  - (A) It has only recently become a possibility.
  - (B) It would be easier to meet if more CEO's were women.
  - (C) It is very close to being a reality for most corporate boards.
  - (D) It might affect the quality of directors' service to corporations.
  - (E) It would be more realizable if CEO's had a more extensive range of business experience.
2. According to the passage, the pressure to appoint women to corporate boards differs from the pressure to employ women in the work force in which of the following ways?
  - (A) Corporate boards are under less pressure because they have such a small number of openings.
  - (B) Corporate boards have received less pressure from stockholders, consumers, and workers within companies to include women on their boards.
  - (C) Corporate boards have received less pressure from the media and the public to include women on their boards.
  - (D) Corporations have only recently been pressured to include women on their boards.
  - (E) Corporations are not subject to statutory penalty for failing to include women on their boards.
3. All of the following are examples of issues that the organization described in the last paragraph would be likely to advise corporations on EXCEPT
  - (A) long-term inflation

- (B) health and safety regulations
  - (C) retirement and pension programs
  - (D) the energy shortage
  - (E) how to develop new markets
4. It can be inferred from the passage that, when seeking to appoint new members to a corporation's board, the chair traditionally looked for candidates who
- (A) had legal and governmental experience
  - (B) had experience dealing with community affairs
  - (C) could work easily with other members of the board
  - (D) were already involved in establishing policy for that corporation
  - (E) had influential connections outside the business world
5. According to the passage, which of the following is true about women outside the business world who are currently serving on corporate boards?
- (A) Most do not serve on more than one board.
  - (B) A large percentage will eventually work on the staff of corporations.
  - (C) Most were already known to the chairs of the board to which they were appointed.
  - (D) A larger percentage are from government and law than are from the nonprofit sector.
  - (E) Most are less than fifty years old.
6. The passage suggests that corporations of the past differ from modern corporations in which of the following ways?
- (A) Corporations had greater input on government policies affecting the business community.
  - (B) Corporations were less responsive to the financial needs of their employees.
  - (C) The ability of a corporation to keep up with changing markets was not a crucial factor in its success.
  - (D) A corporation's effectiveness in coping with community needs was less likely to affect its growth and prosperity.
  - (E) Corporations were subject to more stringent government regulations.
7. Which of the following best describes the organization of the passage?
- (A) A problem is described, and then reasons why various proposed solutions succeeded or failed are discussed.
  - (B) A problem is described, and then an advantage of resolving it is offered.
  - (C) A problem is described, and then reasons for its continuing existence are summarized.
  - (D) The historical origins of a problem are described, and then various measures that have successfully resolved it are discussed.

- (E) The causes of a problem are described, and then its effects are discussed.
8. It can be inferred from the passage that factors making women uniquely valuable members of modern corporate boards would include which of the following?
- I. The nature of modern corporations
  - II. The increased number of women CEO's
  - III. The careers pursued by women currently available to serve on corporate boards
- (A) I only
- (B) II only
- (C) III only
- (D) I and III only
- (E) I, II, and III

### Passage 32

Increasingly, historians are blaming diseases imported from the Old World for the staggering disparity between the indigenous population of America in 1492—new estimates of which soar as high as 100 million, or approximately one-sixth of the human race at that time—and the few million full-blooded Native Americans alive at the end of the nineteenth century. There is no doubt that chronic disease was an important factor in the precipitous decline, and it is highly probable that the greatest killer was epidemic disease, especially as manifested in virgin-soil epidemics.

Virgin-soil epidemics are those in which the populations at risk have had no previous contact with the diseases that strike them and are therefore immunologically almost defenseless. That virgin-soil epidemics were important in American history is strongly indicated by evidence that a number of dangerous maladies—smallpox, measles, malaria, yellow fever, and undoubtedly several more—were unknown in the pre-Columbian New World. The effects of their sudden introduction are demonstrated in the early chronicles of America, which contain reports of horrendous epidemics and steep population declines, confirmed in many cases by recent quantitative analyses of Spanish tribute records and other sources. The evidence provided by the documents of British and French colonies is not as definitive because the conquerors of those areas did not establish permanent settlements and begin to keep continuous records until the seventeenth century, by which time the worst epidemics had probably already taken place. Furthermore, the British tended to drive the native populations away, rather than enslaving them as the Spaniards did, so that the epidemics of British America occurred beyond the range of colonists' direct observation.

Even so, the surviving records of North America do contain references to deadly epidemics among the indigenous population. In 1616-1619 an epidemic, possibly of bubonic or pneumonic plague, swept coastal New England, killing as many as nine out of ten. During the 1630's smallpox, the disease most fatal to the Native American people, eliminated half the population of the Huron and Iroquois confederations. In the 1820's fever devastated the people of the Columbia River area, killing eight out of ten of them.

Unfortunately, the documentation of these and other epidemics is slight and frequently unreliable, and it is necessary to supplement what little we do know with evidence from recent epidemics among Native Americans. For example, in 1952 an outbreak of measles among the Native American inhabitants of Ungava Bay, Quebec, affected 99 percent of the population and killed 7 percent, even though some had the benefit of modern medicine. Cases such as this demonstrate that even diseases that are not normally fatal can have devastating consequences when they strike an immunologically defenseless community.

1. The primary purpose of the passage is to
  - (A) refute a common misconception
  - (B) provide support for a hypothesis
  - (C) analyze an argument
  - (D) suggest a solution to a dilemma
  - (E) reconcile opposing viewpoints
2. According to the passage, virgin-soil epidemics can be distinguished from other catastrophic outbreaks of disease in that virgin-soil epidemics
  - (A) recur more frequently than other chronic diseases
  - (B) affect a minimum of one-half of a given population
  - (C) involve populations with no prior exposure to a disease
  - (D) usually involve a number of interacting diseases
  - (E) are less responsive to medical treatment than are other diseases
3. According to the passage, the British colonists were unlike the Spanish colonists in that the British colonists
  - (A) collected tribute from the native population
  - (B) kept records from a very early date
  - (C) drove Native Americans off the land
  - (D) were unable to provide medical care against epidemic disease
  - (E) enslaved the native populations in America
4. Which of the following can be inferred from the passage concerning Spanish tribute records?
  - (A) They mention only epidemics of smallpox.
  - (B) They were instituted in 1492.
  - (C) They were being kept prior to the seventeenth century.
  - (D) They provide quantitative and qualitative evidence about Native American populations.
  - (E) They prove that certain diseases were unknown in the pre-Columbian New World.
5. The author implies which of the following about measles?
  - (A) It is not usually a fatal disease.

- (B) It ceased to be a problem by the seventeenth century.
  - (C) It is the disease most commonly involved in virgin-soil epidemics.
  - (D) It was not a significant problem in Spanish colonies.
  - (E) It affects only those who are immunologically defenseless against it.
6. Which of the following can be inferred from the passage about the Native American inhabitants of Ungava Bay?
- (A) They were almost all killed by the 1952 epidemic.
  - (B) They were immunologically defenseless against measles.
  - (C) They were the last native people to be struck by a virgin-soil epidemic.
  - (D) They did not come into frequent contact with white Americans until the twentieth century.
  - (E) They had been inoculated against measles.
7. The author mentions the 1952 measles outbreak most probably in order to
- (A) demonstrate the impact of modern medicine on epidemic disease
  - (B) corroborate the documentary evidence of epidemic disease in colonial America
  - (C) refute allegations of unreliability made against the historical record of colonial America
  - (D) advocate new research into the continuing problem of epidemic disease
  - (E) challenge assumptions about how the statistical evidence of epidemics should be interpreted
8. Which of the following, if newly discovered, would most seriously weaken the author's argument concerning the importance of virgin-soil epidemics in the depopulation of Native Americans?
- (A) Evidence setting the pre-Columbian population of the New World at only 80 million
  - (B) Spanish tribute records showing periodic population fluctuations
  - (C) Documents detailing sophisticated Native American medical procedures
  - (D) Fossils indicating Native American contact with smallpox prior to 1492
  - (E) Remains of French settlements dating back to the sixteenth century

### Passage 33

Until recently most astronomers believed that the space between the galaxies in our universe was a near-perfect vacuum. This orthodox view of the universe is now being challenged by astronomers who believe that a heavy "rain" of gas is falling into many galaxies from the supposedly empty space around them. The gas apparently condenses into a collection of small stars, each a little larger than the planet Jupiter. These stars vastly outnumber the other stars in a given galaxy. The amount of "intergalactic rainfall" into some of these galaxies has been enough to double their mass in the time since they formed. Scientists have begun to

suspect that this intergalactic gas is probably a mixture of gases left over from the “big bang” when the galaxies were formed and gas was forced out of galaxies by supernova explosions.

It is well known that when gas is cooled at a constant pressure its volume decreases. Thus, the physicist Fabian reasoned that as intergalactic gas cools, the cooler gas shrinks inward toward the center of the galaxy. Meanwhile its place is taken by hotter intergalactic gas from farther out on the edge of the galaxy, which cools as it is compressed and flows into the galaxy. The net result is a continuous flow of gas, starting as hot gases in intergalactic space and ending as a drizzle of cool gas called a “cooling flow,” falling into the central galaxy.

A fairly heretical idea in the 1970’s, the cooling-flow theory gained support when Fabian observed a cluster of galaxies in the constellation Perseus and found the central galaxy, NGC 1275, to be a strange-looking object with irregular, thin strands of gas radiating from it. According to previous speculation, these strands were gases that had been blown out by an explosion in the galaxy. Fabian, however, disagreed. Because the strands of gas radiating from NGC 1275 are visible in optical photographs, Fabian suggested that such strands consisted not of gas blown out of the galaxy but of cooling flows of gas streaming inward. He noted that the wavelengths of the radiation emitted by a gas would change as the gas cooled, so that as the gas flowed into the galaxy and became cooler, it would emit not x-rays, but visible light, like that which was captured in the photographs. Fabian’s hypothesis was supported by Canizares’ determination in 1982 that most of the gas in the Perseus cluster was at a temperature of 80 million degrees Kelvin, whereas the gas immediately surrounding NGC 1275 (the subject of the photographs) was at one-tenth this temperature.

1. The primary purpose of the passage is to
  - (A) illustrate a hypothesis about the origin of galaxies
  - (B) provide evidence to dispute an accepted theory about the evolution of galaxies
  - (C) summarize the state of and prospects for research in intergalactic astronomy
  - (D) report new data on the origins of intergalactic gas
  - (E) reconcile opposing views on the formation of intergalactic gas
2. The author uses the phrase “orthodox view of the universe” (line 3) to refer to the belief that
  - (A) the space between the galaxies is devoid of matter
  - (B) the space between galaxies is occupied by stars that cannot be detected by optical photographs
  - (C) galaxies have decreased in mass by half since their formation
  - (D) galaxies contain stars, each the size of Jupiter, which form clusters
  - (E) galaxies are being penetrated by gas forced out of other galaxies by supernova explosions
3. It can be inferred from the passage that, if Fabian is correct, gas in the peripheral regions of a galaxy cluster
  - (A) streams outward into intergalactic space

- (B) is hotter than gas in the central regions of the galaxy
  - (C) is composed primarily of gas left over from the big bang
  - (D) results in the creation of unusually large stars
  - (E) expands to increase the size of the galaxy
4. The author of the passage probably mentions Canizares' determination in order to
- (A) clarify an ambiguity in Fabian's research findings
  - (B) illustrate a generalization about the temperature of gas in a galaxy cluster
  - (C) introduce a new argument in support of the orthodox view of galaxies
  - (D) provide support for Fabian's assertions about the Perseus galaxies
  - (E) provide an alternate point of view concerning the movement of gas within a galaxy cluster
5. According to the passage, Fabian believes that gas flowing into a central galaxy has which of the following characteristics?
- (A) It is one-tenth hotter than it was in the outer regions of the galaxy cluster.
  - (B) It emits radiation with wavelengths that change as the gas moves toward the center of the galaxy.
  - (C) The total amount of radiation emitted diminishes as the gas cools.
  - (D) It loses 90 percent of its energy as it moves to the center of the galaxy.
  - (E) It condenses at a rate much slower than the rate of decrease in temperature as the gas flows inward.
6. According to the passage, Fabian's theory makes use of which of the following principles?
- (A) Gas emanating from an explosion will be hotter the more distant it is from the origin.
  - (B) The wavelength of radiation emitted by a gas as it cools remains constant.
  - (C) If pressure remains constant, the volume of a gas will decrease as it is cooled.
  - (D) The volume of a gas will increase as the pressure increases.
  - (E) As gas cools, its density decreases.
7. It can be inferred from the passage that which of the following is true of Fabian's theory?
- (A) It did not receive approval until Canizares' work was published.
  - (B) It was not widely accepted in the 1970's.
  - (C) It did not receive support initially because technology was not available to confirm its tenets.
  - (D) It supports earlier speculation that intergalactic gas was largely the result of explosions outside the galaxy.
  - (E) It was widely challenged until x-ray evidence of gas temperatures in NGC 1275 had been presented.



### Passage 34

Kazuko Nakane's history of the early Japanese immigrants to central California's Pajaro Valley focuses on the development of farming communities there from 1890 to 1940. The Issei (first-generation immigrants) were brought into the Pajaro Valley to raise sugar beets. Like Issei laborers in American cities, Japanese men in rural areas sought employment via the "boss" system. The system comprised three elements: immigrant wage laborers; Issei boardinghouses where laborers stayed; and labor contractors, who gathered workers for a particular job and then negotiated a contract between workers and employer. This same system was originally utilized by the Chinese laborers who had preceded the Japanese. A related institution was the "labor club," which provided job information and negotiated employment contracts and other legal matters, such as the rental of land, for Issei who chose to belong and paid an annual fee to the cooperative for membership.

When the local sugar beet industry collapsed in 1902, the Issei began to lease land from the valley's strawberry farmers. The Japanese provided the labor and the crop was divided between laborers and landowners. The Issei thus moved quickly from wage-labor employment to sharecropping agreements. A limited amount of economic progress was made as some Issei were able to rent or buy farmland directly, while others joined together to form farming corporations. As the Issei began to operate farms, they began to marry and start families, forming an established Japanese American community. Unfortunately, the Issei's efforts to attain agricultural independence were hampered by government restrictions, such as the Alien Land Law of 1913. But immigrants could circumvent such exclusionary laws by leasing or purchasing land in their American-born children's names.

Nakane's case study of one rural Japanese American community provides valuable information about the lives and experiences of the Issei. It is, however, too particularistic. This limitation derives from Nakane's methodology—that of oral history—which cannot substitute for a broader theoretical or comparative perspective. Future research might well consider two issues raised by her study: were the Issei of the Pajaro Valley similar to or different from Issei in urban settings, and what variations existed between rural Japanese American communities?

1. The primary purpose of the passage is to
  - (A) defend a controversial hypothesis presented in a history of early Japanese immigrants to California
  - (B) dismiss a history of an early Japanese settlement in California as narrow and ill constructed
  - (C) summarize and critique a history of an early Japanese settlement in California
  - (D) compare a history of one Japanese American community with studies of Japanese settlements throughout California
  - (E) examine the differences between Japanese and Chinese immigrants to central California in the 1890's
2. Which of the following best describes a "labor club," as defined in the passage?
  - (A) An organization to which Issei were compelled to belong if they sought

employment in the Pajaro Valley

- (B) An association whose members included labor contractors and landowning “bosses”
  - (C) A type of farming corporation set up by Issei who had resided in the Pajaro Valley for some time
  - (D) A cooperative association whose members were dues-paying Japanese laborers
  - (E) A social organization to which Japanese laborers and their families belonged
3. Based on information in the passage, which of the following statements concerning the Alien Land Law of 1913 is most accurate?
- (A) It excluded American-born citizens of Japanese ancestry from landownership.
  - (B) It sought to restrict the number of foreign immigrants to California.
  - (C) It successfully prevented Issei from ever purchasing farmland.
  - (D) It was applicable to first-generation immigrants but not to their American-born children.
  - (E) It was passed under pressure from the Pajaro Valley’s strawberry farmers.
4. Several Issei families join together to purchase a strawberry field and the necessary farming equipment. Such a situation best exemplifies which of the following, as it is described in the passage?
- (A) A typical sharecropping agreement
  - (B) A farming corporation
  - (C) A “labor club”
  - (D) The “boss” system
  - (E) Circumvention of the Alien Land Law
5. The passage suggests that which of the following was an indirect consequence of the collapse of the sugar beet industry in the Pajaro Valley?
- (A) The Issei formed a permanent, family-based community.
  - (B) Boardinghouses were built to accommodate the Issei.
  - (C) The Issei began to lease land in their children’s names.
  - (D) The Issei adopted a labor contract system similar to that used by Chinese immigrants.
  - (E) The Issei suffered a massive dislocation caused by unemployment.
6. The author of the passage would most likely agree that which of the following, if it had been included in Nakane’s study, would best remedy the particularistic nature of that study?
- (A) A statistical table comparing per capita income of Issei wage laborers and sharecroppers in the Pajaro Valley
  - (B) A statistical table showing per capita income of Issei in the Pajaro Valley from

1890 to 1940

- (C) A statistical table showing rates of farm ownership by Japanese Americans in four central California counties from 1890 to 1940
  - (D) A discussion of original company documents dealing with the Pajaro Valley sugar beet industry at the turn of the century
  - (E) Transcripts of interviews conducted with members of the Pajaro Valley Japanese American community who were born in the 1920's and 1930's
7. It can be inferred from the passage that, when the Issei began to lease land from the Valley's strawberry farmers, the Issei most probably did which of the following?
- (A) They used profits made from selling the strawberry crop to hire other Issei.
  - (B) They negotiated such agricultural contracts using the "boss" system.
  - (C) They paid for the use of the land with a share of the strawberry crop.
  - (D) They earned higher wages than when they raised sugar beets.
  - (E) They violated the Alien Land Law.

### Passage 35

It can be argued that much consumer dissatisfaction with marketing strategies arises from an inability to aim advertising at only the likely buyers of a given product.

There are three groups of consumers who are affected by the marketing process. First, there is the market segment—people who need the commodity in question. Second, there is the program target—people in the market segment with the "best fit" characteristics for a specific product. Lots of people may need trousers, but only a few qualify as likely buyers of very expensive designer trousers. Finally, there is the program audience—all people who are actually exposed to the marketing program without regard to whether they need or want the product.

These three groups are rarely identical. An exception occurs occasionally in cases where customers for a particular industrial product may be few and easily identifiable. Such customers, all sharing a particular need, are likely to form a meaningful target, for example, all companies with a particular application of the product in question, such as high-speed fillers of bottles at breweries. In such circumstances, direct selling (marketing that reaches only the program target) is likely to be economically justified, and highly specialized trade media exist to expose members of the program target—and only members of the program target—to the marketing program.

Most consumer-goods markets are significantly different. Typically, there are many rather than few potential customers. Each represents a relatively small percentage of potential sales. Rarely do members of a particular market segment group themselves neatly into a meaningful program target. There are substantial differences among consumers with similar demographic characteristics. Even with all the past decade's advances in information technology, direct selling of consumer goods is rare, and mass marketing—a marketing approach that aims at a wide audience—remains the only economically feasible mode. Unfortunately, there are few

media that allow the marketer to direct a marketing program exclusively to the program target. Inevitably, people get exposed to a great deal of marketing for products in which they have no interest and so they become annoyed.

1. The passage suggests which of the following about highly specialized trade media?
  - (A) They should be used only when direct selling is not economically feasible.
  - (B) They can be used to exclude from the program audience people who are not part of the program target.
  - (C) They are used only for very expensive products.
  - (D) They are rarely used in the implementation of marketing programs for industrial products.
  - (E) They are used only when direct selling has not reached the appropriate market segment.
2. According to the passage, most consumer-goods markets share which of the following characteristics?
  - I. Customers who differ significantly from each other
  - II. Large numbers of potential customers
  - III. Customers who each represent a small percentage of potential sales
  - (A) I only
  - (B) II only
  - (C) I and II only
  - (D) II and III only
  - (E) I, II, and III
3. The passage suggests which of the following about direct selling?
  - (A) It is used in the marketing of most industrial products.
  - (B) It is often used in cases where there is a large program target.
  - (C) It is not economically feasible for most marketing programs.
  - (D) It is used only for products for which there are many potential customers.
  - (E) It is less successful at directing a marketing program to the target audience than are other marketing approaches.
4. The author mentions “trousers” (lines 9 and 11) most likely in order to
  - (A) make a comparison between the program target and the program audience
  - (B) emphasize the similarities between the market segment and the program target
  - (C) provide an example of the way three groups of consumers are affected by a marketing program
  - (D) clarify the distinction between the market segment and the program target
  - (E) introduce the concept of the program audience

5. Which of the following best exemplifies the situation described in the last two sentences of the passage?
- (A) A product suitable for women age 21-30 is marketed at meetings attended only by potential customers.
  - (B) A company develops a new product and must develop an advertising campaign to create a market for it.
  - (C) An idea for a specialized product remains unexplored because media exposure of the product to its few potential customers would be too expensive.
  - (D) A new product is developed and marketers collect demographic data on potential consumers before developing a specific advertising campaign.
  - (E) A product suitable for men age 60 and over is advertised in a magazine read by adults of all ages.
6. The passage suggests that which of the following is true about the marketing of industrial products like those discussed in the third paragraph?
- (A) The market segment and program target are identical.
  - (B) Mass marketing is the only feasible way of advertising such products.
  - (C) The marketing program cannot be directed specifically to the program target.
  - (D) More customers would be needed to justify the expense of direct selling.
  - (E) The program audience would necessarily be made up of potential customers, regardless of the marketing approach that was used.
7. The passage supports which of the following statements about demographic characteristics and marketing?
- (A) Demographic research is of no use in determining how successful a product will be with a particular group of consumers.
  - (B) A program audience is usually composed of people with similar demographic characteristics.
  - (C) Psychological factors are more important than demographic factors in defining a market segments.
  - (D) Consumers with similar demographic characteristics do not necessarily form a meaningful program target.
  - (E) Collecting demographic data is the first step that marketers take in designing a marketing program.
8. It can be inferred from the passage that which of the following is true for most consumer-goods markets?
- (A) The program audience is smaller than the market segment.
  - (B) The program audience and the market segment are usually identical.
  - (C) The market segment and the program target are usually identical.
  - (D) The program target is larger than the market segment.

(E) The program target and the program audience are not usually identical.

### Passage 36

Protein synthesis begins when the gene encoding a protein is activated. The gene's sequence of nucleotides is transcribed into a molecule of messenger RNA (mRNA), which reproduces the information contained in that sequence. Transported outside the nucleus to the cytoplasm, the mRNA is translated into the protein it encodes by an organelle known as a ribosome, which strings together amino acids in the order specified by the sequence of elements in the mRNA molecule. Since the amount of mRNA in a cell determines the amount of the corresponding protein, factors affecting the abundance of mRNA's play a major part in the normal functioning of a cell by appropriately regulating protein synthesis. For example, an excess of certain proteins can cause cells to proliferate abnormally and become cancerous; a lack of the protein insulin results in diabetes.

Biologists once assumed that the variable rates at which cells synthesize different mRNA's determine the quantities of mRNA's and their corresponding proteins in a cell. However, recent investigations have shown that the concentrations of most mRNA's correlate best, not with their synthesis rate, but rather with the equally variable rates at which cells degrade the different mRNA's in their cytoplasm. If a cell degrades both a rapidly and a slowly synthesized mRNA slowly, both mRNA's will accumulate to high levels.

An important example of this phenomenon is the development of red blood cells from their unspecialized parent cells in bone marrow. For red blood cells to accumulate sufficient concentrations of hemoglobin (which transports oxygen) to carry out their main function, the cells' parent cells must simultaneously produce more of the constituent proteins of hemoglobin and less of most other proteins. To do this, the parent cells halt synthesis of non-hemoglobin mRNA's in the nucleus and rapidly degrade copies of the non-hemoglobin mRNA's remaining in the cytoplasm. Halting synthesis of mRNA alone would not affect the quantities of proteins synthesized by the mRNA's still existing in the cytoplasm. Biologists now believe that most cells can regulate protein production most efficiently by varying both mRNA synthesis and degradation, as developing red cells do, rather than by just varying one or the other.

1. The passage is primarily concerned with discussing the
  - (A) influence of mRNA concentrations on the development of red blood cells
  - (B) role of the synthesis and degradation of mRNA in cell functioning
  - (C) mechanism by which genes are transcribed into mRNA
  - (D) differences in mRNA concentrations in cell nuclei and in the cytoplasm
  - (E) way in which mRNA synthesis contributes to the onset of diabetes
2. The passage suggests that a biologist who held the view described in the first sentence of the second paragraph would most probably also have believed which of the following?
  - (A) The rate of degradation of specific mRNA's has little effect on protein concentrations.
  - (B) The rate of degradation of specific mRNA's should be studied intensively.

- (C) The rates of synthesis and degradation for any given mRNA are normally equal.
  - (D) Different mRNA's undergo degradation at widely varying rates.
  - (E) Most mRNA's degrade very rapidly.
3. Which of the following best describes the relationship between the second and third paragraphs of the passage?
- (A) The second paragraph presents arguments in support of a new theory and the third paragraph presents arguments against that same theory.
  - (B) The second paragraph describes a traditional view and the third paragraph describes the view that has replaced it on the basis of recent investigations.
  - (C) The third paragraph describes a specific case of a phenomenon that is described generally in the second paragraph.
  - (D) The third paragraph describes an investigation that was undertaken to resolve problems raised by phenomena described in the second paragraph.
  - (E) Both paragraphs describe in detail specific examples of the phenomenon that is introduced in the first paragraph.
4. The accumulation of concentrations of hemoglobin in red blood cells is mentioned in the passage as an example of which of the following?
- (A) The effectiveness of simultaneous variation of the rates of synthesis and degradation of mRNA
  - (B) The role of the ribosome in enabling a parent cell to develop properly into a more specialized form
  - (C) The importance of activating the genes for particular proteins at the correct moment
  - (D) The abnormal proliferation of a protein that threatens to make the cell cancerous
  - (E) The kind of evidence that biologists relied on for support of a view of mRNA synthesis that is now considered obsolete
5. To begin to control a disease caused by a protein deficiency, the passage suggests that a promising experimental treatment would be to administer a drug that would reduce
- (A) only the degradation rate for the mRNA of the protein involved
  - (B) only the synthesis rate for the mRNA of the protein involved
  - (C) both the synthesis and degradation rates for the mRNA of the protein involved
  - (D) the incidence of errors in the transcription of mRNA's from genetic nucleotide sequences
  - (E) the rate of activity of ribosomes in the cytoplasm of most cells
6. According to the passage, which of the following best describes the current view

on the relationship between the synthesis and the degradation of mRNA in regulating protein synthesis?

- (A) Biologists have recently become convinced that the ribosome controls the rates of synthesis and degradation of mRNA.
  - (B) There is no consensus among biologists as to the significance of mRNA degradation in regulating protein synthesis.
  - (C) The concept of mRNA degradation is so new that most biologists still believe that the vital role in protein regulation belongs to mRNA synthesis.
  - (D) Degradation of mRNA is now considered to be the key process and mRNA synthesis is no longer believed to play a significant role.
  - (E) Degradation of mRNA is now considered to be as important as mRNA synthesis has been, and still is, believed to be.
7. According to the passage, which of the following can happen when protein synthesis is not appropriately regulated?
- (A) Diabetes can result from errors that occur when the ribosomes translate mRNA into protein.
  - (B) Cancer can result from an excess of certain proteins and diabetes can result from an insulin deficiency.
  - (C) A deficiency of red blood cells can occur if bone marrow cells produce too much hemoglobin.
  - (D) Cancer can be caused by excessively rapid degradation of certain amino acids in the cytoplasm of cells.
  - (E) Excessive synthesis of one protein can trigger increased degradation of mRNA's for other proteins and create severe protein imbalances.
8. The passage suggests that a biologist who detected high levels of two proteins in a certain type of cell would be likely to consider which of the following as a possible explanation?
- (A) The rate of mRNA degradation for one of the proteins increases as this type of cell develops a more specialized function.
  - (B) The two proteins are most likely constituents of a complex substance supporting the cells' specialized function.
  - (C) The cells are likely to proliferate abnormally and possibly become cancerous due to the levels of these proteins.
  - (D) The mRNA's for both proteins are being degraded at a low rate in that type of cell.
  - (E) The mRNA's for the two proteins are being synthesized at identical rates in that type of cell.

### Passage 37

(This passage was excerpted from material written in 1990.)



As the economic role of multinational, global corporations expands, the international economic environment will be shaped increasingly not by governments or international institutions, but by the interaction between governments and global corporations, especially in the United States, Europe, and Japan. A significant factor in this shifting world economy is the trend toward regional trading blocs of nations, which has a potentially large effect on the evolution of the world trading system. Two examples of this trend are the United States-Canada Free Trade Agreement (FTA) and Europe 1992, the move by the European Community (EC) to dismantle impediments to the free flow of goods, services, capital, and labor among member states by the end of 1992. However, although numerous political and economic factors were operative in launching the move to integrate the EC's markets, concern about protectionism within the EC does not appear to have been a major consideration. This is in sharp contrast to the FTA; the overwhelming reason for that bilateral initiative was fear of increasing United States protectionism. Nonetheless, although markedly different in origin and nature, both regional developments are highly significant in that they will foster integration in the two largest and richest markets of the world, as well as provoke questions about the future direction of the world trading system.

1. The primary purpose of the passage as a whole is to
  - (A) describe an initiative and propose its continuance
  - (B) chronicle a development and illustrate its inconsistencies
  - (C) identify a trend and suggest its importance
  - (D) summarize a process and question its significance
  - (E) report a phenomenon and outline its probable future
2. According to the passage, all of the following are elements of the shifting world economy EXCEPT
  - (A) an alteration in the role played by governments
  - (B) an increase in interaction between national governments and international regulatory institutions
  - (C) an increase in the formation of multinational trading alliances
  - (D) an increase in integration in the two richest markets of the world
  - (E) a fear of increasing United States protectionism
3. The passage suggests which of the following about global corporations?
  - (A) Their continued growth depends on the existence of a fully integrated international market.
  - (B) Their potential effect on the world market is a matter of ongoing concern to international institutions.
  - (C) They will have to assume quasi-governmental functions if current economic trends continue.
  - (D) They have provided a model of economic success for regional trading blocs.
  - (E) Their influence on world economics will continue to increase.

4. According to the passage, one similarity between the FTA and Europe 1992 is that they both
- (A) overcame concerns about the role of politics in the shifting world economy
  - (B) originated out of concern over unfair trade practices by other nations
  - (C) exemplify a trend toward regionalization of commercial markets
  - (D) place the economic needs of the trading bloc ahead of those of the member nations
  - (E) help to ensure the continued economic viability of the world community
5. Which of the following can be inferred from the passage about the European Community prior to the adoption of the Europe 1992 program?
- (A) There were restrictions on commerce between the member nations.
  - (B) The economic policies of the member nations focused on global trading issues.
  - (C) There were few impediments to trade between the member nations and the United States.
  - (D) The flow of goods between the member nations and Canada was insignificant.
  - (E) Relations between multinational corporations and the governments of the member nations were strained.
6. The author discusses the FTA and Europe 1992 most likely in order to
- (A) point out the similarities between two seemingly disparate trading alliances
  - (B) illustrate how different economic motivations produce different types of trading blocs
  - (C) provide contrasting examples of a trend that is influencing the world economy
  - (D) identify the most important characteristics of successful economic integration
  - (E) trace the history of regional trading blocs
7. Which of the following best describes the organization of the passage?
- (A) An argument is put forth and evidence for and against it given.
  - (B) An assertion is made and opposing evidence presented.
  - (C) Two hypotheses are described and shown to inconsistent with one another.
  - (D) A phenomenon is identified and illustrations of this phenomenon offered.
  - (E) A specific case of a phenomenon is discussed a generalization drawn.

### Passage 38

In *Forces of Production*, David Noble examines the transformation of the machine-tool industry as the industry moved from reliance on skilled artisans to automation. Noble writes from a Marxist perspective, and his central argument is that management, in its decisions to automate, conspired against labor: the power that the skilled machinists wielded in the industry

was intolerable to management. Noble fails to substantiate this claim, although his argument is impressive when he applies the Marxist concept of “de-skilling”—the use of technology to replace skilled labor—to the automation of the machine-tool industry. In automating, the industry moved to computer-based, digitized “numerical-control” (N/C) technology, rather than to artisan-generated “record-playback” (R/P) technology.

Although both systems reduced reliance on skilled labor, Noble clearly prefers R/P, with its inherent acknowledgment of workers’ skills: unlike N/C, its programs were produced not by engineers at their computers, but by skilled machinists, who recorded their own movements to “teach” machines to duplicate those movements. However, Noble’s only evidence of conspiracy is that, although the two approaches were roughly equal in technical merit, management chose N/C. From this he concludes that automation is undertaken not because efficiency demands it or scientific advances allow it, but because it is a tool in the ceaseless war of capitalists against labor.

1. The author of the passage is primarily concerned with
  - (A) reexamining a political position and defending its validity
  - (B) examining a management decision and defending its necessity
  - (C) analyzing a scholarly study and pointing out a central weakness
  - (D) explaining a trend in automation and warning about its dangers
  - (E) chronicling the history of an industry and criticizing its development
2. According to information in the passage, the term “de-skilling” refers to the
  - (A) loss of skills to industry when skilled workers are replaced by unskilled laborers
  - (B) substitution of mechanized processes for labor formerly performed by skilled workers
  - (C) labor theory that automation is technologically comparable to skilled labor
  - (D) process by which skilled machinists “teach” machines to perform certain tasks
  - (E) exclusion of skilled workers from participation in the development of automated technology
3. Which of the following best characterizes the function of the second paragraph of the passage?
  - (A) It develops a topic introduced in the first paragraph.
  - (B) It provides evidence to refute a claim presented in the first paragraph.
  - (C) It gives examples of a phenomenon mentioned in the first paragraph.
  - (D) It presents a generalization about examples given in the first paragraph.
  - (E) It suggests two possible solutions to a problem presented in the first paragraph.
4. The passage suggests which of the following about N/C automation in the machine-tool industry?

- (A) It displaced fewer skilled workers than R/P automation did.
  - (B) It could have been implemented either by experienced machinists or by computer engineers.
  - (C) It was designed without the active involvement skilled machinists.
  - (D) It was more difficult to design than R/P automation was.
  - (E) It was technically superior to R/P automation.
5. Which of the following phrases most clearly reveals the attitude of the author of the passage toward Noble's central argument?
- (A) "conspired against" (line 6)
  - (B) "intolerable to management" (line 7)
  - (C) "impressive when he applies the Marxist concept" (line 9)
  - (D) "clearly prefers" (line 16)
  - (E) "only evidence of conspiracy" (line 21)
6. The author of the passage commends Noble's book for which of the following?
- (A) Concentrating on skilled as opposed to unskilled workers in its discussion of the machine-tool industry
  - (B) Offering a generalization about the motives behind the machine-tool industry's decision to automate
  - (C) Making an essential distinction between two kinds of technology employed in the machine-tool industry
  - (D) Calling into question the notion that managers conspired against labor in the automation of the machine-tool industry
  - (E) Applying the concept of de-skilling to the machine tool industry
7. Which of the following best characterizes Forces of Production as it is described in the passage?
- (A) A comparison of two interpretations of how a particular industry evolved
  - (B) An examination of the origin of a particular concept in industrial economics
  - (C) A study that points out the weakness of a particular interpretation of an industrial phenomenon
  - (D) A history of a particular industry from an ideological point of view
  - (E) An attempt to relate an industrial phenomenon in one industry to a similar phenomenon in another industry

### Passage 39

The sensation of pain cannot accurately be described as "located" at the point of an injury, or, for that matter, in any one place in the nerves or brain. Rather, pain signals—and pain relief—are delivered through a highly complex interacting circuitry.

When a cell is injured, a rush of prostaglandins sensitizes nerve endings at the injury.

Prostaglandins are chemicals produced in and released from virtually all mammalian cells when they are injured: these are the only pain signals that do not originate in the nervous system. Aspirin and other similar drugs (such as indomethacin and ibuprofen) keep prostaglandins from being made by interfering with an enzyme known as prostaglandin synthetase, or cyclooxygenase. The drugs' effectiveness against pain is proportional to their success in blocking this enzyme at the site of injury.

From nerve endings at the injury, pain signals move to nerves feeding into the spinal cord. The long, tubular membranes of nerve cells carry electrical impulses. When electrical impulses get to the spinal cord, a pain-signaling chemical known as substance P is released there. Substance P then excites nearby neurons to send impulses to the brain. Local anesthetics such as novocaine and xylocaine work by blocking the electrical transmission along nerves in a particular area. They inhibit the flow of sodium ions through the membranes, making the nerves electrically quiescent; thus no pain signals are sent to the spinal cord or to the brain.

Recent discoveries in the study of pain have involved the brain itself—the supervising organ that notices pain signals and that sends messages down to the spinal cord to regulate incoming pain traffic. Endorphins—the brain's own morphine—are a class of small peptides that help to block pain signals within the brain itself. The presence of endorphins may also help to explain differences in response to pain signals, since individuals seem to differ in their ability to produce endorphins. It now appears that a number of techniques for blocking chronic pain—such as acupuncture and electrical stimulation of the central brain stem—involve the release of endorphins in the brain and spinal cord.

1. The passage is primarily concerned with
  - (A) analyzing ways that enzymes and other chemicals influence how the body feels pain
  - (B) describing the presence of endorphins in the brain and discussing ways the body blocks pain within the brain itself
  - (C) describing how pain signals are conveyed in the body and discussing ways in which the pain signals can be blocked
  - (D) demonstrating that pain can be influenced by acupuncture and electrical stimulation of the central brain stem
  - (E) differentiating the kinds of pain that occur at different points in the body's nervous system
2. According to the passage, which of the following is one of the first things to occur when cells are injured?
  - (A) The flow of electrical impulses through nerve cells at the site of the injury is broken.
  - (B) The production of substance P traveling through nerve cells to the brain increases.
  - (C) Endorphins begin to speed up the response of nerve cells at the site of the injury.
  - (D) A flood of prostaglandins sensitizes nerve endings at the site of the injury.

- (E) Nerve cells connected to the spinal cord become electrically quiescent.
3. Of the following, which is most likely attributable to the effect of endorphins as described in the passage?
- (A) After an injection of novocaine, a patient has no feeling in the area where the injection was given.
- (B) After taking ibuprofen, a person with a headache gets quick relief.
- (C) After receiving a local anesthetic, an injured person reports relief in the anesthetized area.
- (D) After being given aspirin, a child with a badly scraped elbow feels better.
- (E) After acupuncture, a patient with chronic back pain reports that the pain is much less severe.
4. It can be inferred from the passage that if the prostaglandin synthetase is only partially blocked, which of the following is likely to be true?
- (A) Some endorphins will be produced, and some pain signals will be intensified.
- (B) Some substance P is likely to be produced, so some pain signals will reach the brain.
- (C) Some sodium ions will be blocked, so some pain signals will not reach the brain.
- (D) Some prostaglandins will be produced, but production of substance P will be prevented.
- (E) Some peptides in the brain will receive pain signals and begin to regulate incoming pain traffic.

### Passage 40

Japanese firms have achieved the highest levels of manufacturing efficiency in the world automobile industry. Some observers of Japan have assumed that Japanese firms use the same manufacturing equipment and techniques as United States firms but have benefited from the unique characteristics of Japanese employees and the Japanese culture. However, if this were true, then one would expect Japanese auto plants in the United States to perform no better than factories run by United States companies. This is not the case; Japanese-run automobile plants located in the United States and staffed by local workers have demonstrated higher levels of productivity when compared with factories owned by United States companies.

Other observers link high Japanese productivity to higher levels of capital investment per worker. But a historical perspective leads to a different conclusion. When the two top Japanese automobile makers matched and then doubled United States productivity levels in the mid-sixties, capital investment per employee was comparable to that of United States firms. Furthermore, by the late seventies, the amount of fixed assets required to produce one vehicle was roughly equivalent in Japan and in the United States.

Since capital investment was not higher in Japan, it had to be other factors that led to higher productivity. A more fruitful explanation may lie with Japanese production techniques.

Japanese automobile producers did not simply implement conventional processes more effectively: they made critical changes in United States procedures. For instance, the mass-production philosophy of United States automakers encouraged the production of huge lots of cars in order to utilize fully expensive, component-specific equipment and to occupy fully workers who have been trained to execute one operation efficiently. Japanese automakers chose to make small-lot production feasible by introducing several departures from United States practices, including the use of flexible equipment that could be altered easily to do several different production tasks and the training of workers in multiple jobs. Automakers could schedule the production of different components or models on single machines, thereby eliminating the need to store the buffer stocks of extra components that result when specialized equipment and workers are kept constantly active.

1. The primary purpose of the passage is to
  - (A) present the major steps of a process
  - (B) clarify an ambiguity
  - (C) chronicle a dispute
  - (D) correct misconceptions
  - (E) defend an accepted approach
2. The author suggests that if the observers of Japan mentioned in line 3 were correct, which of the following would be the case?
  - (A) The equipment used in Japanese automobile plants would be different from the equipment used in United States plants.
  - (B) Japanese workers would be trained to do several different production jobs.
  - (C) Culture would not have an influence on the productivity levels of workers.
  - (D) The workers in Japanese-run plants would have higher productivity levels regardless of where they were located.
  - (E) The production levels of Japanese-run plants located in the United States would be equal to those of plants run by United States companies.
3. Which of the following statements concerning the productivity levels of automakers can be inferred from the passage?
  - (A) Prior to the 1960's, the productivity levels of the top Japanese automakers were exceeded by those of United States automakers.
  - (B) The culture of a country has a large effect on the productivity levels of its automakers.
  - (C) During the late 1970's and early 1980's, productivity levels were comparable in Japan and the United States.
  - (D) The greater the number of cars that are produced in a single lot, the higher a plant's productivity level.
  - (E) The amount of capital investment made by automobile manufacturers in their factories determines the level of productivity.

4. According to the passage, which of the following statements is true of Japanese automobile workers?
- (A) Their productivity levels did not equal those of United States automobile workers until the late seventies.
  - (B) Their high efficiency levels are a direct result of cultural influences.
  - (C) They operate component-specific machinery.
  - (D) They are trained to do more than one job.
  - (E) They produce larger lots of cars than do workers in United States factories.
5. Which of the following best describes the organization of the first paragraph?
- (A) A thesis is presented and supporting examples are provided.
  - (B) Opposing views are presented, classified, and then reconciled.
  - (C) A fact is stated, and an explanation is advanced and then refuted.
  - (D) A theory is proposed, considered, and then amended.
  - (E) An opinion is presented, qualified, and then reaffirmed.
6. It can be inferred from the passage that one problem associated with the production of huge lots of cars is which of the following?
- (A) The need to manufacture flexible machinery and equipment
  - (B) The need to store extra components not required for immediate use
  - (C) The need for expensive training programs for workers, which emphasize the development of facility in several production jobs
  - (D) The need to alter conventional mass-production processes
  - (E) The need to increase the investment per vehicle in order to achieve high productivity levels
7. Which of the following statements is supported by information stated in the passage?
- (A) Japanese and United States automakers differ in their approach to production processes.
  - (B) Japanese automakers have perfected the use of single-function equipment.
  - (C) Japanese automakers invest more capital per employee than do United States automakers.
  - (D) United States-owned factories abroad have higher production levels than do Japanese owned plants in the United States.
  - (E) Japanese automakers have benefited from the cultural heritage of their workers.
8. With which of the following predictive statement regarding Japanese automakers would the author most likely agree?
- (A) The efficiency levels of the Japanese automakers will decline if they become less flexible in their approach to production.



- (B) Japanese automakers productivity levels double during the late 1990's.
- (C) United States automakers will originate new production processes before Japanese automakers do.
- (D) Japanese automakers will hire fewer workers than will United States automakers because each worker is required to perform several jobs.
- (E) Japanese automakers will spend less on equipment repairs than will United States automakers because Japanese equipment can be easily altered.

## Answer Key

### Passage 31

1. D	2. E	3. E	4. C	5. C
6. D	7. B	8. D	9.	10.

### Passage 32

1. B	2. C	3. C	4. C	5. A
6. B	7. B	8. D	9.	10.

### Passage 33

1. B	2. A	3. B	4. D	5. B
6. C	7. B	8.	9.	10.

### Passage 34

1. C	2. D	3. D	4. B	5. A
6. C	7. C	8.	9.	10.

### Passage 35

1. B	2. E	3. C	4. D	5. E
6. A	7. D	8. E	9.	10.

### Passage 36

1. B	2. A	3. C	4. A	5. A
6. E	7. B	8. D	9.	10.

Passage 37

1. C	2. B	3. E	4. C	5. A
6. C	7. D	8.	9.	10.

Passage 38

1. C	2. B	3. A	4. C	5. E
6. E	7. D	8.	9.	10.

Passage 39

1. C	2. D	3. E	4. B	5.
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Passage 40

1. D	2. E	3. A	4. D	5. C
6. B	7. A	8. A	9.	10.