

Topic Oriented Test (TOT) - 2**Passage 1 (1/5)**

In the eighteenth century, Japan's feudal overlords, from the **shogun** to the humblest **samurai**, found themselves under financial stress. In part, this stress can be attributed to the overlords' failure to adjust to a rapidly expanding economy, but the stress was also due to factors beyond the overlords' control. Concentration of the samurai in castle-towns had acted as a stimulus to trade. Commercial efficiency, in turn, had put temptations in the way of buyers. Since most samurai had been reduced to idleness by years of peace, encouraged to engage in scholarship and martial exercises or to perform administrative tasks that took little time, it is not surprising that their tastes and habits grew expensive. Overlords' income, despite the increase in rice production among their tenant farmers, failed to keep pace with their expenses. Although shortfalls in overlords' income resulted almost as much from laxity among their tax collectors (the nearly inevitable outcome of hereditary office-holding) as from their higher standards of living, a misfortune like a fire or flood, bringing an increase in expenses or a drop in revenue, could put a domain in debt to the city rice-brokers who handled its finances. Once in debt, neither the individual samurai nor the shogun himself found it easy to recover.

It was difficult for individual samurai overlords to increase their income because the amount of rice that farmers could be made to pay in taxes was not unlimited, and since the income of Japan's central government consisted in part of taxes collected by the shogun from his huge domain, the government too was constrained. Therefore, the Tokugawa shoguns began to look to other sources for revenue. Cash profits from government-owned mines were already on the decline because the most easily worked deposits of silver and gold had been exhausted, although debasement of the coinage had compensated for the loss. Opening up new farmland was a possibility, but most of what was suitable had already been exploited and further reclamation was technically unfeasible. Direct taxation of the samurai themselves would be politically dangerous. This left the shoguns only commerce as a potential source of government income.

Most of the country's wealth, or so it seemed, was finding its way into the hands of city merchants. It appeared reasonable that they should contribute part of that revenue to ease the shogun's burden of financing the state. A means of obtaining such revenue was soon found by levying forced loans, known as *goyo-kin*; although these were not taxes in the strict sense, since they were irregular in timing and arbitrary in amount, they were high in yield. Unfortunately, they pushed up prices. Thus, regrettably, the Tokugawa shoguns' search for solvency for the government made it increasingly difficult for individual Japanese who lived on fixed stipends to make ends meet.

1. The passage is most probably an excerpt from
 - (A) an economic history of Japan
 - (B) the memoirs of a samurai warrior
 - (C) a modern novel about eighteenth-century Japan
 - (D) an essay contrasting Japanese feudalism with its Western counterpart
 - (E) an introduction to a collection of Japanese folktales
2. Which of the following financial situations is most analogous to the financial situation in which Japan's Tokugawa shoguns found themselves in the eighteenth century?
 - (A) A small business borrows heavily to invest in new equipment, but is able to pay off its debt early when it is awarded a lucrative government contract.
 - (B) Fire destroys a small business, but insurance covers the cost of rebuilding.
 - (C) A small business is turned down for a loan at a local bank because the owners

- have no credit history.
- (D) A small business has to struggle to meet operating expenses when its profits decrease.
- (E) A small business is able to cut back sharply on spending through greater commercial efficiency and thereby compensate for a loss of revenue.
3. Which of the following best describes the attitude of the author toward the samurai discussed in lines 11-16?
- (A) Warmly approving
- (B) Mildly sympathetic
- (C) Bitterly disappointed
- (D) Harshly disdainful
- (E) Profoundly shocked
4. According to the passage, the major reason for the financial problems experienced by Japan's feudal overlords in the eighteenth century was that
- (A) spending had outdistanced income
- (B) trade had fallen off
- (C) profits from mining had declined
- (D) the coinage had been sharply debased
- (E) the samurai had concentrated in castle-towns
5. The passage implies that individual samurai did not find it easy to recover from debt for which of the following reasons?
- (A) Agricultural production had increased.
- (B) Taxes were irregular in timing and arbitrary in amount.
- (C) The Japanese government had failed to adjust to the needs of a changing economy.
- (D) The domains of samurai overlords were becoming smaller and poorer as government revenues increased.
- (E) There was a limit to the amount in taxes that farmers could be made to pay.
6. The passage suggests that, in eighteenth-century Japan, the office of tax collector
- (A) was a source of personal profit to the officeholder
- (B) was regarded with derision by many Japanese
- (C) remained within families
- (D) existed only in castle-towns
- (E) took up most of the officeholder's time
7. Which of the following could best be substituted for the word "This" in line 47 without changing the meaning of the passage?
- (A) The search of Japan's Tokugawa shoguns for solvency
- (B) The importance of commerce in feudal Japan
- (C) The unfairness of the tax structure in eighteenth century Japan
- (D) The difficulty of increasing government income by other means

- (E) The difficulty experienced by both individual samurai and the shogun himself in extricating themselves from debt
8. The passage implies that which of the following was the primary reason why the Tokugawa shoguns turned to city merchants for help in financing the state?
- (A) A series of costly wars had depleted the national treasury.
- (B) Most of the country's wealth appeared to be in city merchants' hands.
- (C) Japan had suffered a series of economic reversals due to natural disasters such as floods.
- (D) The merchants were already heavily indebted to the shoguns.
- (E) Further reclamation of land would not have been economically advantageous.
9. According to the passage, the actions of the Tokugawa shoguns in their search for solvency for the government were regrettable because those actions
- (A) raised the cost of living by pushing up prices
- (B) resulted in the exhaustion of the most easily worked deposits of silver and gold
- (C) were far lower in yield than had originally been anticipated
- (D) did not succeed in reducing government spending
- (E) acted as a deterrent to trade

Passage 2 (2/5)

Between the eighth and eleventh centuries A. D., the Byzantine Empire staged an almost unparalleled economic and cultural revival, a recovery that is all the more striking because it followed a long period of severe internal decline. By the early eighth century, the empire had lost roughly two-thirds of the territory it had possessed in the year 600, and its remaining area was being raided by Arabs and Bulgarians, who at times threatened to take Constantinople and extinguish the empire altogether. The wealth of the state and its subjects was greatly diminished, and artistic and literary production had virtually ceased. By the early eleventh century, however, the empire had regained almost half of its lost possessions, its new frontiers were secure, and its influence extended far beyond its borders. The economy had recovered, the treasury was full, and art and scholarship had advanced.

To consider the Byzantine military, cultural, and economic advances as differentiated aspects of a single phenomenon is reasonable. After all, these three forms of progress have gone together in a number of states and civilizations. Rome under Augustus and fifth-century Athens provide the most obvious examples in antiquity. Moreover, an examination of the apparent sequential connections among military, economic, and cultural forms of progress might help explain the dynamics of historical change.

The common explanation of these apparent connections in the case of Byzantium would run like this: when the empire had turned back enemy raids on its own territory and had begun to raid and conquer enemy territory, Byzantine resources naturally expanded and more money became available to patronize art and literature. Therefore, Byzantine military achievements led to economic advances, which in turn led to cultural revival.

No doubt this hypothetical pattern did apply at times during the course of the recovery. Yet it is not clear that military advances invariably came first, economic advances second, and intellectual advances third. In the 860's the Byzantine Empire began to recover from Arab incursions so that by 872 the military balance with the Abbasid Caliphate had been permanently altered in the empire's favor. The beginning of the empire's economic revival, however, can be placed between 810 and 830. Finally, the Byzantine revival of learning appears to have begun even earlier. A number of notable scholars and writers appeared by 788 and, by the last decade

of the eighth century, a cultural revival was **in full bloom**, a revival that lasted until the fall of Constantinople in 1453. Thus the commonly expected order of military revival followed by economic and then by cultural recovery was reversed in Byzantium. In fact, the revival of Byzantine learning may itself have influenced the subsequent economic and military expansion.

1. Which of the following best states the central idea of the passage?
 - (A) The Byzantine Empire was a unique case in which the usual order of military and economic revival preceding cultural revival was reversed.
 - (B) The economic, cultural, and military revival in the Byzantine Empire between the eighth and eleventh centuries was similar in its order to the sequence of revivals in Augustan Rome and fifth century Athens.
 - (C) After 810 Byzantine economic recovery spurred a military and, later, cultural expansion that lasted until 1453.
 - (D) The eighth-century revival of Byzantine learning is an inexplicable phenomenon, and its economic and military precursors have yet to be discovered.
 - (E) The revival of the Byzantine Empire between the eighth and eleventh centuries shows cultural rebirth preceding economic and military revival, the reverse of the commonly accepted order of progress.
2. The primary purpose of the second paragraph is which of the following?
 - (A) To establish the uniqueness of the Byzantine revival
 - (B) To show that Augustan Rome and fifth-century Athens are examples of cultural, economic, and military expansion against which all subsequent cases must be measured
 - (C) To suggest that cultural, economic, and military advances have tended to be closely interrelated in different societies
 - (D) To argue that, while the revivals of Augustan Rome and fifth-century Athens were similar, they are unrelated to other historical examples
 - (E) To indicate that, wherever possible, historians should seek to make comparisons with the earliest chronological examples of revival
3. It can be inferred from the passage that by the eleventh century the Byzantine military forces
 - (A) had reached their peak and begun to decline
 - (B) had eliminated the Bulgarian army
 - (C) were comparable in size to the army of Rome under Augustus
 - (D) were strong enough to withstand the Abbasid Caliphate's military forces
 - (E) had achieved control of Byzantine governmental structures
4. It can be inferred from the passage that the Byzantine Empire sustained significant territorial losses
 - (A) in 600
 - (B) during the seventh century
 - (C) a century after the cultural achievements of the Byzantine Empire had been lost
 - (D) soon after the revival of Byzantine learning
 - (E) in the century after 873

5. In the third paragraph, the author most probably provides an explanation of the apparent connections among economic, military, and cultural development in order to
- (A) suggest that the process of revival in Byzantium accords with this model
 - (B) set up an order of events that is then shown to be not generally applicable to the case of Byzantium
 - (C) cast aspersions on traditional historical scholarship about Byzantium
 - (D) suggest that Byzantium represents a case for which no historical precedent exists
 - (E) argue that military conquest is the paramount element in the growth of empires
6. Which of the following does the author mention as crucial evidence concerning the manner in which the Byzantine revival began?
- (A) The Byzantine military revival of the 860's led to economic and cultural advances.
 - (B) The Byzantine cultural revival lasted until 1453.
 - (C) The Byzantine economic recovery began in the 900's.
 - (D) The revival of Byzantine learning began toward the end of the eighth century.
 - (E) By the early eleventh century the Byzantine Empire had regained much of its lost territory.
7. According to the author, "The common explanation" (line 28) of connections between economic, military, and cultural development is
- (A) revolutionary and too new to have been applied to the history of the Byzantine Empire
 - (B) reasonable, but an antiquated theory of the nature of progress
 - (C) not applicable to the Byzantine revival as a whole, but does perhaps accurately describe limited periods during the revival
 - (D) equally applicable to the Byzantine case as a whole and to the history of military, economic, and cultural advances in ancient Greece and Rome
 - (E) essentially not helpful, because military, economic, and cultural advances are part of a single phenomenon

Passage 3 (3/5)

Virtually everything astronomers know about objects outside the solar system is based on the detection of photons—quanta of electromagnetic radiation. Yet there is another form of radiation that permeates the universe: neutrinos. With (as its name implies) no electric charge, and negligible mass, the neutrino interacts with other particles so rarely that a neutrino can cross the entire universe, even traversing substantial aggregations of matter, without being absorbed or even deflected. Neutrinos can thus escape from regions of space where light and other kinds of electromagnetic radiation are blocked by matter. Furthermore, neutrinos carry with them information about the site and circumstances of their production: therefore, the detection of cosmic neutrinos could provide new information about a wide variety of cosmic phenomena and about the history of the universe.

But how can scientists detect a particle that interacts so infrequently with other matter? Twenty-five years passed between Pauli's hypothesis that the neutrino existed and its actual detection: since then virtually all research with neutrinos has been with neutrinos created artificially in large particle accelerators and studied under neutrino microscopes. But a neutrino

telescope, capable of detecting cosmic neutrinos, is difficult to construct. No apparatus can detect neutrinos unless it is extremely massive, because great mass is synonymous with huge numbers of nucleons (neutrons and protons), and the more massive the detector, the greater the probability of one of its nucleon's reacting with a neutrino. In addition, the apparatus must be sufficiently shielded from the interfering effects of other particles.

Fortunately, a group of astrophysicists has proposed a means of detecting cosmic neutrinos by harnessing the mass of the ocean. Named DUMAND, for Deep Underwater **Muon** and Neutrino Detector, the project calls for placing an array of light sensors at a depth of five kilometers under the ocean surface. The detecting medium is the seawater itself: when a neutrino interacts with a particle in an atom of seawater, the result is a cascade of electrically charged particles and a flash of light that can be detected by the sensors. The five kilometers of seawater above the sensors will shield them from the interfering effects of other high-energy particles raining down through the atmosphere.

The strongest motivation for the DUMAND project is that it will exploit an important source of information about the universe. The extension of astronomy from visible light to radio waves to x-rays and gamma rays never failed to lead to the discovery of unusual objects such as radio galaxies, quasars, and pulsars. Each of these discoveries came as a surprise. Neutrino astronomy will doubtless bring its own share of surprises.

1. Which of the following titles best summarizes the passage as a whole?
 - (A) At the Threshold of Neutrino Astronomy
 - (B) Neutrinos and the History of the Universe
 - (C) The Creation and Study of Neutrinos
 - (D) The DUMAND System and How It Works
 - (E) The Properties of the Neutrino
2. With which of the following statements regarding neutrino astronomy would the author be most likely to agree?
 - (A) Neutrino astronomy will supersede all present forms of astronomy.
 - (B) Neutrino astronomy will be abandoned if the DUMAND project fails.
 - (C) Neutrino astronomy can be expected to lead to major breakthroughs in astronomy.
 - (D) Neutrino astronomy will disclose phenomena that will be more surprising than past discoveries.
 - (E) Neutrino astronomy will always be characterized by a large time lag between hypothesis and experimental confirmation.
3. In the last paragraph, the author describes the development of astronomy in order to
 - (A) suggest that the potential findings of neutrino astronomy can be seen as part of a series of astronomical successes
 - (B) illustrate the role of surprise in scientific discovery
 - (C) demonstrate the effectiveness of the DUMAND apparatus in detecting neutrinos
 - (D) name some cosmic phenomena that neutrino astronomy will illuminate
 - (E) contrast the motivation of earlier astronomers with that of the astrophysicists working on the DUMAND project
4. According to the passage, one advantage that neutrinos have for studies in astronomy is that they

- (A) have been detected for the last twenty-five years
 - (B) possess a variable electric charge
 - (C) are usually extremely massive
 - (D) carry information about their history with them
 - (E) are very similar to other electromagnetic particles
5. According to the passage, the primary use of the apparatus mentioned in lines 24-32 would be to
- (A) increase the mass of a neutrino
 - (B) interpret the information neutrinos carry with them
 - (C) study the internal structure of a neutrino
 - (D) see neutrinos in distant regions of space
 - (E) detect the presence of cosmic neutrinos
6. The passage states that interactions between neutrinos and other matter are
- (A) rare
 - (B) artificial
 - (C) undetectable
 - (D) unpredictable
 - (E) hazardous
7. The passage mentions which of the following as a reason that neutrinos are hard to detect?
- (A) Their pervasiveness in the universe
 - (B) Their ability to escape from different regions of space
 - (C) Their inability to penetrate dense matter
 - (D) The similarity of their structure to that of nucleons
 - (E) The infrequency of their interaction with other matter
8. According to the passage, the interaction of a neutrino with other matter can produce
- (A) particles that are neutral and massive
 - (B) a form of radiation that permeates the universe
 - (C) inaccurate information about the site and circumstances of the neutrino's production
 - (D) charged particles and light
 - (E) a situation in which light and other forms of electromagnetic radiation are blocked
9. According to the passage, one of the methods used to establish the properties of neutrinos was
- (A) detection of photons
 - (B) observation of the interaction of neutrinos with gamma rays
 - (C) observation of neutrinos that were artificially created
 - (D) measurement of neutrinos that interacted with particles of seawater

(E) experiments with electromagnetic radiation

Passage 4 (4/5)

Most economists in the United States seem captivated by the spell of the free market. Consequently, nothing seems good or normal that does not accord with the requirements of the free market. A price that is determined by the seller or, for that matter, established by anyone other than the aggregate of consumers seems pernicious. Accordingly, it requires a major act of will to think of price-fixing (the determination of prices by the seller) as both "normal" and having a valuable economic function. In fact, price-fixing is normal in all industrialized societies because the industrial system itself provides, as an effortless consequence of its own development, the price-fixing that it requires. Modern industrial planning requires and rewards great size. Hence, a comparatively small number of large firms will be competing for the same group of consumers. That each large firm will act with consideration of its own needs and thus avoid selling its products for more than its competitors charge is commonly recognized by advocates of free-market economic theories. But each large firm will also act with full consideration of the needs that it has in common with the other large firms competing for the same customers. Each large firm will thus avoid significant price-cutting, because price-cutting would be prejudicial to the common interest in a stable demand for products. Most economists do not see price-fixing when it occurs because they expect it to be brought about by a number of explicit agreements among large firms; it is not.

Moreover, those economists who argue that allowing the free market to operate without interference is the most efficient method of establishing prices have not considered the economies of non-socialist countries other than the United States. These economies employ intentional price-fixing, usually in an overt fashion. Formal price-fixing by cartel and informal price-fixing by agreements covering the members of an industry are commonplace. Were there something peculiarly efficient about the free market and inefficient about price-fixing, the countries that have avoided the first and used the second would have suffered drastically in their economic development. There is no indication that they have.

Socialist industry also works within a framework of controlled prices. In the early 1970's, the Soviet Union began to give firms and industries some of the flexibility in adjusting prices that a more informal evolution has accorded the capitalist system. Economists in the United States have hailed the change as a return to the free market. But Soviet firms are no more subject to prices established by a free market over which they exercise little influence than are capitalist firms; rather, Soviet firms have been given the power to fix prices.

1. The primary purpose of the passage is to
 - (A) refute the theory that the free market plays a useful role in the development of industrialized societies
 - (B) suggest methods by which economists and members of the government of the United States can recognize and combat price-fixing by large firms
 - (C) show that in industrialized societies price-fixing and the operation of the free market are not only compatible but also mutually beneficial
 - (D) explain the various ways in which industrialized societies can fix prices in order to stabilize the free market
 - (E) argue that price-fixing, in one form or another, is an inevitable part of and benefit to the economy of any industrialized society
2. The passage provides information that would answer which of the following questions about price-fixing?
 - I. What are some of the ways in which prices can be fixed?

- II. For what products is price-fixing likely to be more profitable than the operation of the free market?
- III. Is price-fixing more common in socialist industrialized societies or in non-socialist industrialized societies?
- (A) I only
(B) III only
(C) I and II only
(D) II and III only
(E) I, II, and III
3. The author's attitude toward "Most economists in the United States"(line 1) can best be described as
- (A) spiteful and envious
(B) scornful and denunciatory
(C) critical and condescending
(D) ambivalent but deferential
(E) uncertain but interested
4. It can be inferred from the author's argument that a price fixed by the seller "seems pernicious" (line 7) because
- (A) people do not have confidence in large firms
(B) people do not expect the government to regulate prices
(C) most economists believe that consumers as a group should determine prices
(D) most economists associate fixed prices with communist and socialist economies
(E) most economists believe that no one group should determine prices
5. The suggestion in the passage that price-fixing in industrialized societies is normal arises from the author's statement that price-fixing is
- (A) a profitable result of economic development
(B) an inevitable result of the industrial system
(C) the result of a number of carefully organized decisions
(D) a phenomenon common to industrialized and non-industrialized societies
(E) a phenomenon best achieved cooperatively by government and industry
6. According to the author, price-fixing in non-socialist countries is often
- (A) accidental but productive
(B) illegal but useful
(C) legal and innovative
(D) traditional and rigid
(E) intentional and widespread
7. According to the author, what is the result of the Soviet Union's change in economic policy in the 1970's?
- (A) Soviet firms show greater profit.

- (B) Soviet firms have less control over the free market.
 - (C) Soviet firms are able to adjust to technological advances.
 - (D) Soviet firms have some authority to fix prices.
 - (E) Soviet firms are more responsive to the free market.
8. With which of the following statements regarding the behavior of large firms in industrialized societies would the author be most likely to agree?
- (A) The directors of large firms will continue to anticipate the demand for products.
 - (B) The directors of large firms are less interested in achieving a predictable level of profit than in achieving a large profit.
 - (C) The directors of large firms will strive to reduce the costs of their products.
 - (D) Many directors of large firms believe that the government should establish the prices that will be charged for products.
 - (E) Many directors of large firms believe that the price charged for products is likely to increase annually.
9. In the passage, the author is primarily concerned with
- (A) predicting the consequences of a practice
 - (B) criticizing a point of view
 - (C) calling attention to recent discoveries
 - (D) proposing a topic for research
 - (E) summarizing conflicting opinions

Passage 5 (5/5)

Caffeine, the stimulant in coffee, has been called “the most widely used psychoactive substance on Earth.” Snyder, Daly and Bruns have recently proposed that caffeine affect behavior by countering the activity in the human brain of a naturally occurring chemical called adenosine. Adenosine normally depresses neuron firing in many areas of the brain. It apparently does this by inhibiting the release of neurotransmitters, chemicals that carry nerve impulses from one neuron to the next. Like many other agents that affect neuron firing, adenosine must first bind to specific receptors on neuronal membranes. There are at least two classes of these receptors, which have been designated A₁ and A₂. Snyder et al propose that caffeine, which is structurally similar to adenosine, is able to bind to both types of receptors, which prevents adenosine from attaching there and allows the neurons to fire more readily than they otherwise would.

For many years, caffeine's effects have been attributed to its inhibition of the production of phosphodiesterase, an enzyme that breaks down the chemical called cyclic AMP. A number of neurotransmitters exert their effects by first increasing cyclic AMP concentrations in target neurons. Therefore, prolonged periods at the elevated concentrations, as might be brought about by a phosphodiesterase inhibitor, could lead to a greater amount of neuron firing and, consequently, to behavioral stimulation. But Snyder et al point out that the caffeine concentrations needed to inhibit the production of phosphodiesterase in the brain are much higher than those that produce stimulation. Moreover, other compounds that block phosphodiesterase's activity are not stimulants.

To buttress their case that caffeine acts instead by preventing adenosine binding, Snyder et al compared the stimulatory effects of a series of caffeine derivatives with their ability to dislodge adenosine from its receptors in the brains of mice. “In general,” they reported, “the ability of the compounds to compete at the receptors correlates with their ability to stimulate locomotion in the mouse; i.e., the higher their capacity to bind at the receptors, the higher their ability to stimulate

locomotion." Theophylline, a close structural relative of caffeine and the major stimulant in tea, was one of the most effective compounds in both regards.

There were some apparent exceptions to the general correlation observed between adenosine-receptor binding and stimulation. One of these was a compound called 3-isobutyl-1-methylxanthine (IBMX), which bound very well but actually depressed mouse locomotion. Snyder et al suggests that this is not a major **stumbling block** to their hypothesis. The problem is that the compound has mixed effects in the brain, a not unusual occurrence with psychoactive drugs. Even caffeine, which is generally known only for its stimulatory effects, displays this property, depressing mouse locomotion at very low concentrations and stimulating it at higher ones.

1. The primary purpose of the passage is to
 - (A) discuss a plan for investigation of a phenomenon that is not yet fully understood
 - (B) present two explanations of a phenomenon and reconcile the differences between them
 - (C) summarize two theories and suggest a third theory that overcomes the problems encountered in the first two
 - (D) describe an alternative hypothesis and provide evidence and arguments that support it
 - (E) challenge the validity of a theory by exposing the inconsistencies and contradictions in it
2. Which of the following, if true, would most weaken the theory proposed by Snyder et al?
 - (A) At very low concentrations in the human brain, both caffeine and theophylline tend to have depressive rather than stimulatory effects on human behavior.
 - (B) The ability of caffeine derivatives at very low concentrations to dislodge adenosine from its receptors in mouse brains correlates well with their ability to stimulate mouse locomotion at these low concentrations.
 - (C) The concentration of cyclic AMP in target neurons in the human brain that leads to increased neuron firing can be produced by several different phosphodiesterase inhibitors in addition to caffeine.
 - (D) The concentration of caffeine required to dislodge adenosine from its receptors in the human brain is much greater than the concentration that produces behavioral stimulation in humans.
 - (E) The concentration of IBMX required to dislodge adenosine from its receptors in mouse brains is much smaller than the concentration that stimulates locomotion in the mouse.
3. According so Snyder et al, caffeine differs from adenosine in that caffeine
 - (A) stimulates behavior in the mouse and in humans, whereas adenosine stimulates behavior in humans only
 - (B) has mixed effects in the brain, whereas adenosine has only a stimulatory effect
 - (C) increases cyclic AMP concentrations in target neurons, whereas adenosine decreases such concentrations
 - (D) permits release of neurotransmitters when it is bound to adenosine receptors, whereas adenosine inhibits such release

- (E) inhibits both neuron firing and the production of phosphodiesterase when there is a sufficient concentration in the brain, whereas adenosine inhibits only neuron firing
4. In response to experimental results concerning IBMX, Snyder et al contended that it is not uncommon for psychoactive drugs to have
- (A) mixed effects in the brain
 - (B) inhibitory effects on enzymes in the brain
 - (C) close structural relationships with caffeine
 - (D) depressive effects on mouse locomotion
 - (E) the ability to dislodge caffeine from receptors in the brain
5. The passage suggests that Snyder et al believe that if the older theory concerning caffeine's effects were correct, which of the following would have to be the case?
- I. All neurotransmitters would increase the short-term concentration of cyclic AMP in target neurons.
 - II. Substances other than caffeine that inhibit the production of phosphodiesterase would be stimulants.
 - III. All concentration levels of caffeine that are high enough to produce stimulation would also inhibit the production of phosphodiesterase.
- (A) I only
 - (B) I and II only
 - (C) I and III only
 - (D) II and III only
 - (E) I, II, and III
6. According to Snyder et al, all of the following compounds can bind to specific receptors in the brain EXCEPT
- (A) IBMX
 - (B) caffeine
 - (C) adenosine
 - (D) theophylline
 - (E) phosphodiesterase
7. Snyder et al suggest that caffeine's ability to bind to A₁ and A₂ receptors can be at least partially attributed to which of the following?
- (A) The chemical relationship between caffeine and phosphodiesterase
 - (B) The structural relationship between caffeine and adenosine
 - (C) The structural similarity between caffeine and neurotransmitters
 - (D) The ability of caffeine to stimulate behavior
 - (E) The natural occurrence of caffeine and adenosine in the brain
8. The author quotes Snyder et al in lines 38-43 most probably in order to
- (A) reveal some of the assumptions underlying their theory
 - (B) summarize a major finding of their experiments

- (C) point out that their experiments were limited to the mouse
 (D) indicate that their experiments resulted only in general correlations
 (E) refute the objections made by supporters of the older theory
9. The last paragraph of the passage performs which of the following functions?
- (A) Describes a disconfirming experimental result and reports the explanation given by Snyder et al in an attempt to reconcile this result with their theory.
 (B) Specifies the basis for the correlation observed by Snyder et al and presents an explanation in an attempt to make the correlation consistent with the operation of psychoactive drugs other than caffeine.
 (C) Elaborates the description of the correlation observed by Snyder et al and suggests an additional explanation in an attempt to make the correlation consistent with the older theory.
 (D) Reports inconsistent experimental data and describes the method Snyder et al will use to reanalyze this data.
 (E) Provides an example of the hypothesis proposed by Snyder et al and relates this example to caffeine's properties.

ANSWERS**Passage 1 (1/5)**

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

Passage 2 (2/5)

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

Passage 3 (3/5)

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

Passage 4 (4/5)

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

Passage 5 (5/5)

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