

1. Given that X and Y are non-negative, what is the value of X?
(1) $2X + 2Y \leq 40$ (2) $X - 2Y \leq 20$
2. The Mathematics Club in a school held an open house on three afternoons. 115, 75 and 110 students attended on the first, second and third afternoons respectively. 30 attended only on the first day, 35 on the first and second days. 70 attended the first and the third days and 35 attended on the second and third days. How many attended on all the three days?
(A) 15 (B) 25 (C) 21 (D) 20 (E) 30
3. What are the values of 3 integers, a, b and c? (1) $ab = 8$ (2) $bc = 9$
4. Is the average of the largest and the smallest of four given numbers greater than the average of the four numbers?
(1) The difference between the largest and the second largest numbers is greater than the difference between the second smallest and the smallest numbers.
(2) The difference between the largest and the second largest numbers is less than the difference between the second largest and the second smallest numbers.
5. The range of values of X for which $\sqrt{x - x^2 + 12} \geq 0$ is valid is:
(A) $-3 \leq X \leq 4$ (B) $3 \leq X \leq 5$ (C) $-4 \leq X \leq 3$ (D) $-3 \leq X \leq -1$
(E) $-3 \leq X \leq -10$
6. What are the ages of three brothers?
(1) The product of their ages is 21. (2) The sum of their ages is not divisible by 3.
7. Two types of widgets, namely type A and type B, are produced on a machine. The number of machine hours available per week is 80. How many widgets of type A must be produced?
(1) One unit of type A widget requires 2 machine hours and one unit of type B widget requires 4 machine hours.
(2) Every week, at least 10 units of type A widgets and at least 15 units of type B widgets must be produced.
8. The sides of a rectangle are all produced in order, in such a way that the length of each side is increased by k times itself. The area of the new quadrilateral formed becomes 2.5 times the area of the original rectangle. The value of k is:
(A) $1/3$ (B) $1/4$ (C) $1/2$ (D) $2/3$ (E) $1/5$
9. How many sets of natural number solutions does the equation $2(X - 4) + Y + Z = 0$ have?
(A) 9 (B) 12 (C) 14 (D) 8 (E) 4
10. What is the area of a regular hexagon?
(1) The length of the boundary line of the hexagon is 36 cm.
(2) The area of the hexagon is 6 times the area of an equilateral triangle formed on one of the sides.
11. What is the price of mangoes per kg?
(1) Ten kg of mangoes and two dozens of oranges cost \$ 252.
(2) Two kg of mangoes could be bought in exchange for one dozen oranges.
12. How many regular polygons are possible in which the measures of the interior angles, in degrees, are integers?
(A) 8 (B) 6 (C) 10 (D) 20 (E) 24

13. What is the numerical value of

$$\frac{(a+b)^8(a-b)^5}{(a-b)^3(a+b)^6(a-b)^2}$$

- (1) $a + b = 12$ (2) $a - b = 8$

14. $yz = 0$. Is x positive? (1) $x > y$ (2) $x > z$

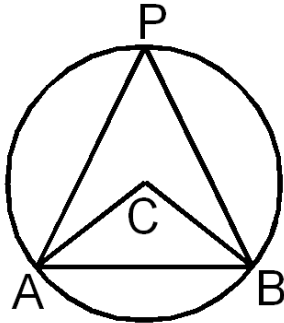
15. The sum of the squares of the digits of a two digit number is 65. How much should be added to this number to get another two digit number in which the digits are in the reverse order?
(A) 59 (B) 25 (C) 63 or 27 (d) 21 (E) 32

16. A line 10 cm long is drawn. A square is constructed with this line segment as diagonal. Then a second square is drawn with a side of the first square as diagonal. This process is repeated 'n' times, until the length of a side of the nth square is less than 1/100. What is the least value of 'n'?
(A) 10 (B) 20 (C) 11 (D) 26 (E) 22

17. According to statistics, the probability that a 25 year old person will live one more year is 0.998. An insurance firm suggests that the person buy an insurance policy with a benefit of \$ 1000 each, premium for risk being \$ 3. One thousand such policies are issued. What profit will the firm expect to get from such a policy?
(A) \$ 4 (B) \$ 3 (C) \$ 2 (D) \$ 1 (E) \$ 10

18. What % of X is Y?
(1) $2X + 5Y = 41$ (2) $Y = 40\% \text{ of } X + 1.8$

19. C is the centre of the circle. Is triangle CAB acute angled?

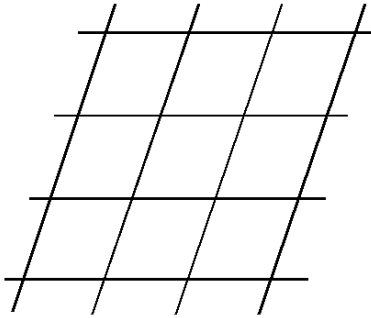


- (1) $CA = CB$ (2) Triangle PAB is acute angled.

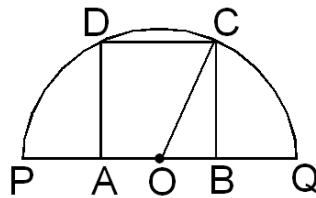
20. Find the sum of all three digit numbers which leave a remainder 2 when divided by either 7 or 5.
(A) 14179 (B) 14157 (C) 15011 (D) 14171 (E) 14000

21. N, a set of natural numbers is partitioned into subsets: $S_1 = \{1\}$ $S_2 = \{2, 3\}$ $S_3 = \{4, 5, 6\}$ $S_4 = \{7, 8, 9, 10\}$ and so on. The sum of the elements of the subset S_{30} is:
(A) 12505 (B) 14115 (C) 13515 (D) 16505 (E) 14000

22. The diagram shows two sets of parallel lines, each set consisting of four lines. What is the total number of parallelograms in the grid?



- (A) 36 (B) 32 (C) 48 (D) 27 (E) 49
23. There are four numbers in sequence. The average of first three is 6; the average of the last three is 7 and the last number is 3 more than the first. The average of second & third numbers is:
- (A) 6 (B) 6.5 (C) 5.75 (D) 7 (E) Indeterminate
24. The area of a square ABCD symmetrically inscribed in a semicircle (center O) of radius 20 is:



- (A) 300 (B) 320 (C) 360 (D) 380 (E) 400
25. Two internal combustion engines of the same power output were subjected to an efficiency test and it was found that one of them consumed 600 grams of petrol, while the other, which was in operation 2 hours less, consumed 384 grams. If the first engine had consumed as much petrol per hour as the second, and the second, as much as the first, then both engines would have consumed equal amounts of petrol during the same period of operation as before. How much petrol does each engine consume per hour?
- (A) 36, 48 gms / hr (B) 60, 48 gms / hr (C) 60, 72 gms / hr (D) 48, 72 gms / hr
(E) 30, 60 gms / hr
26. p, q, r, s, t are in G.P. Is the common ratio negative?
(1) The product $pqrst$ is positive (2) $q < p$
27. X is a positive integer. Is it odd or even?
(1) $X^2 + X$ is even (2) $(X + 2)(X - 4)$ is even
28. p is a positive integer. Is it even or odd?
(1) $p(p + 3)$ is even (2) $(p - 1)(p + 4)$ is even

29.



The figure shown represents a board with four rows of pegs, and at the bottom of the board are four cells numbered 1 to 4. Whenever the ball shown passes through the opening between two adjacent pegs in the same row, it will hit the peg directly beneath the opening. The ball then has probability $\frac{1}{2}$ of passing through the opening immediately to the left of that peg and probability $\frac{1}{2}$ of passing through the opening immediately to the right. What is the probability that when the ball passes through the first two pegs at the top it will end up in cell 2?

- A. $1/16$ B. $1/8$ C. $1/4$ D. $3/8$ E. $1/2$

30. What is the greatest possible area of a triangular region with one vertex at the center of a circle of radius 1 and the other two vertices on the circle?

- A. $\sqrt{3}/4$ B. $1/2$ C. $\pi/4$ D. 1 E. $\sqrt{2}$

31. A certain office supply store stocks 2 sizes of self-stick notepads, each in 4 colors: Blue, Green, Yellow or Pink. The store packs the notepads in packages that contain either 3 notepads of the same size and the same color or 3 notepads of the same size and of 3 different colors. If the order in which the colors are packed is not considered, how many different packages of the types described above are possible?

- A) 6 B) 8 C) 16 D) 24 E) 32

32. If n is an integer between 10 and 99 is $n < 80$?
 (1) The sum of the two digits of n is a prime number.
 (2) Each of the two digits of n is a prime number.

33. Is $x + y < 1$?
 (1) $x < 8/9$ (2) $y < 1/8$

34. A certain car averages 25 miles per gallon when driving in the city and 40 miles to the gallon when driving on the highway. According to these rates, which of the following is closest to the number of miles per gallon that the car averages when it is driven 10 miles in the city and 50 miles on the highway?

- (A) 28 (B) 30 (C) 33 (D) 36 (E) 38

35. If the operation $\wedge$ denotes one of the four arithmetic operations addition, subtraction, multiplication, or division, is $(6 \wedge 2) \wedge 4 = 6 \wedge (2 \wedge 4)$?

- (1) $3 \wedge 2 > 3$ (2) $3 \wedge 1 = 3$

36. A certain cloth with a diameter of 20 inches is placed in a circular tray with a diameter of 24 inches. What fraction of trays surface is not covered by a cloth?

- (A) $1/6$ (B) $1/5$ (C) $11/36$ (D) $25/36$ (E) $5/6$

37. For which of the following functions f is $f(x) = f(1-x)$ for all x ?

- (A) $f(x) = 1-x$
 (B) $f(x) = 1-x^2$
 (C) $f(x) = x^2 - (1-x)^2$
 (D) $f(x) = x^2(1-x)^2$
 (E) $f(x) = x/(1-x)$

Section 2 - Verbal - 41 Questions, 75 minutes

1. In California today, Hispanics under the age of eighteen account for more than 43%, compared with a decade ago, when it was about 35%.
 - A. In California today, Hispanics under the age of eighteen account for more than 43%, compared with a decade ago, when it was about 35%.
 - B. Of the Californians under the age of eighteen, today more than 43% of them are Hispanic, compared with a decade ago, when it was about 35%.
 - C. Today, more than 43% of Californians under the age of eighteen are Hispanic, compared with about 35% a decade ago.
 - D. Today, compared to a decade ago, Californians who are Hispanics under the age of eighteen account for more than 43%, whereas it was about 35%.
 - E. Today, Hispanics under the age of eighteen in California account for more than 43%, unlike a decade ago, when it was about 35%.

2. The government predicts that, for consumers and businesses that make a large number of long-distance calls, the Federal communication's recent telephone rate cuts will greatly reduce costs, though some consumer groups disagree with the government's estimates, suggesting they are too optimistic.
 - A. The government predicts that, for consumers and businesses that make a large number of long-distance calls, the Federal communication's recent telephone rate cuts will greatly reduce costs,
 - B. The government predicts that costs will be greatly reduced for consumers and businesses that make a large number of long-distance calls by the Federal Communication Commission's telephone rate cuts,
 - C. The government's prediction is, for consumers and businesses making a large number of long-distance calls, costs will be greatly reduced by the recent telephone rate cuts made by the Federal Communications Commission,
 - D. For consumers and businesses that make large number of long-distance calls, the government prediction that the Federal Communication's recent telephone rate cuts will greatly reduce costs,
 - E. For consumers and businesses making a large number of long-distance calls, the government predicts that the recent telephone rate cuts that the Federal Communications Commission has made will greatly reduce costs,

3. Not one of the potential investors is expected to make an offer to buy First Interstate Bank until a merger agreement is signed that includes a provision for penalties if the deal were not to be concluded.
 - A. is expected to make an offer to buy First Interstate Bank until a merger agreement is signed that includes a provision for penalties if the deal were
 - B. is expected to make an offer to buy First Interstate Bank until they sign a merger agreement including a provision for penalties if the deal was
 - C. is expected to make an offer to buy First Interstate Bank until a merger agreement be signed by them with a provision for penalties if he deal were
 - D. are expected to make an offer for buying First Interstate Bank until it signs a merger agreement with a provision for penalties included if the deal was
 - E. are expected to be making an offer for buying First Interstate Bank until they sign a merger agreement including a provision for penalties if the deal were

Many literary detectives have pored over a great puzzle concerning the writer Marcel Proust: what happened in 1909? How did *Contre Saint-Beuve*, an essay attacking the methods of the critic Saint Beuve, turn into the start of the novel *Remembrance of Things Past*? A recently published letter from Proust to the editor Vallette confirms that Fallois, the editor of the 1954 edition of *Contre Saint-Beuve*, made an essentially correct guess about the relationship of the essay to the novel. Fallois proposed that Proust had tried to begin a novel in 1908, abandoned it for what was to be a long demonstration of Saint-Beuve's blindness to the real nature of great writing, found the essay giving rise to personal memories and fictional developments, and allowed these to take over in a steadily developing novel.

Draft passages in Proust's 1909 notebooks indicate that the transition from essay to novel began in *Contre Saint-Beuve*, when Proust introduced several examples to show the powerful influence that involuntary memory exerts over the creative imagination. In effect, in trying to demonstrate that the imagination is more profound and less submissive to the intellect than Saint-Beuve assumed, Proust elicited vital memories of his own and, finding subtle connections between them, began to amass the material for *Remembrance*. By August, Proust was writing to Vallette, informing him of his intention to develop the material as a novel. Maurice Bardeche, in *Marcel Proust, romancier*, has shown the importance in the drafts of *Remembrance* of spontaneous and apparently random associations of Proust's subconscious. As incidents and reflections occurred to Proust, he continually inserted new passages altering and expanding his narrative. But he found it difficult to control the drift of his inspiration. The very richness and complexity of the meaningful relationships that kept presenting and rearranging themselves on all levels, from abstract intelligence to profound dreamy feelings, made it difficult for Proust to set them out coherently. The beginning of control came when he saw how to connect the beginning and the end of his novel.

Intrigued by Proust's claim that he had "begun and finished" *Remembrance* at the same time, Henri Bonnet discovered that parts of *Remembrance's* last book were actually started in 1909. Already in that year, Proust had drafted descriptions of his novel's characters in their old age that would appear in the final book of *Remembrance*, where the permanence of art is set against the ravages of time. The letter to Vallette, drafts of the essay and novel, and Bonnet's researches establish in broad outline the process by which Proust generated his novel out of the ruins of his essay. But those of us who hoped, with Kolb, that Kolb's newly published complete edition of Proust's correspondence for 1909 would document the process in greater detail are disappointed. For until Proust was confident that he was at last in sight of a viable structure for *Remembrance*, he told few correspondents that he was producing anything more ambitious than *Contre Saint-Beuve*.

4. Which of the following best states the author's attitude toward the information that scholars have gathered about Proust's writing in 1909?
 - (A) The author is disappointed that no new documents have come to light since Fallois's speculations.
 - (B) The author is dissatisfied because there are too many gaps and inconsistencies in the drafts.
 - (C) The author is confident that Fallois's 1954 guess has been proved largely correct, but regrets that still more detailed documentation concerning Proust's transition from the essay to the novel has not emerged.
 - (D) The author is satisfied that Fallois's judgment was largely correct, but feels that Proust's early work in designing and writing the novel was probably far more deliberate than Fallois's description of the process would suggest.
 - (E) The author is satisfied that the facts of Proust's life in 1909 have been thoroughly established, but believes such documents as drafts and correspondence are only of limited value in a critical assessment of Proust's writing.
5. The author of the passage implies that which of the following would be the LEAST useful source of information about Proust's transition from working on *Contre Saint-Beuve* to having a viable structure for *Remembrance of Things Past*?
 - (A) Fallois's comments in the 1954 edition of *Contre Saint-Beuve*
 - (B) Proust's 1909 notebooks, including the drafts of *Remembrance of Things Past*
 - (C) Proust's 1909 correspondence, excluding the letter to Vallette
 - (D) Bardeche's *Marcel Proust, romancier*
 - (E) Bonnet's researches concerning Proust's drafts of the final book of *Remembrance of Things Past*

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6. The passage offers information to answer which of the following questions?
 - (A) Precisely when in 1909 did Proust decide to abandon *Contre Saint-Beuve*?
 - (B) Precisely when in 1909 did Proust decide to connect the beginning and the end of *Remembrance of Things Past*?
 - (C) What was the subject of the novel that Proust attempted in 1908?
 - (D) What specific criticisms of Saint-Beuve appear, in fictional form, in *Remembrance of Things Past*?
 - (E) What is a theme concerning art that appears in the final book of *Remembrance of Things Past*?
7. Which of the following best describes the relationship between *Contre Saint-Beuve* and *Remembrance of Things Past* as it is explained in the passage?
 - (A) Immediately after abandoning *Contre Saint-Beuve*, at Vallette's suggestion, Proust started *Remembrance* as a fictional demonstration that Saint-Beuve was wrong about the imagination.
 - (B) Immediately after abandoning *Contre Saint-Beuve*, at Vallette's suggestion, Proust turned his attention to *Remembrance*, starting with incidents that had occurred to him while planning the essay.
 - (C) Despondent that he could not find a coherent structure for *Contre Saint-Beuve*, an essay about the role of memory in fiction, Proust began instead to write *Remembrance*, a novel devoted to important early memories.
 - (D) While developing his argument about the imagination in *Contre Saint-Beuve*, Proust described and began to link together personal memories that became a foundation for *Remembrance*.
 - (E) While developing his argument about memory and imagination in *Contre Saint-Beuve*, Proust created fictional characters to embody the abstract themes in his essay.

8. In any field, experience is required for a proficient person to become an expert. Through experience, a proficient person gradually develops a repertory of model situations that allows an immediate, intuitive response to each new situation. This is the hallmark of expertise, and for this reason computerized “expert systems” cannot be as good as human experts. Although computers have the ability to store millions of bits of information, the knowledge of human experts, who benefit from the experience of thousands of situations, is not stored within their brains in the form of rules and facts.

The argument requires the assumption of which one of the following?

- (A) Computers can show no more originality in responding to a situation than that built into them by their designers.
 - (B) The knowledge of human experts cannot be adequately rendered into the type of information that a computer can store.
 - (C) Human experts rely on information that can be expressed by rules and facts when they respond to new situations.
 - (D) Future advances in computer technology will not render computers capable of sorting through greater amounts of information.
 - (E) Human experts rely heavily on intuition while they are developing a repertory of model situations.
9. Consumers are deeply concerned about the quantity of plastic packaging on the market and have spurred manufacturers to find ways to recycle plastic materials. Despite their efforts, however, only 6.5 percent of plastic is not being recycled, as compared to 33 percent of container glass.
- Each of the following, if true, helps to explain the relatively low rate of plastic recycling EXCEPT:
- (A) Many factories are set up to accept and make economical use of recycled glass, whereas there are few factories that make products out of recycled plastic.
 - (B) Many plastic products are incompatible and cannot be recycled together, whereas most containers made of glass are compatible.
 - (C) The manufacture of new plastic depletes oil reserves, whereas the manufacture of new glass uses renewable resources.
 - (D) Unlike glass, which can be heated to thousands of degrees during the recycling process to burn off contaminants, recycled plastic cannot be heated enough to sterilize it.
 - (E) Plastic polymers tend to break down during the recycling process and weaken the resulting product, whereas glass does not break down.

10. The bones of Majungatholus atopus, a meat-eating dinosaur that is a distant relative of Tyrannosaurus rex and closely resembles South American predatory dinosaurs, have been discovered in Madagascar.

- A. The bones of Majungatholus atopus, a meat-eating dinosaur that is a distant relative of Tyrannosaurus rex and closely resembles South American predatory dinosaurs, have been discovered in Madagascar.
- B. The bones of a meat-eating dinosaur, Majungatholus atopus, a distant relative of Tyrannosaurus rex and with a close resemblance to South American predatory dinosaurs, has been discovered in Madagascar.
- C. In Madagascar, the bones of a meat-eating dinosaur, Majungatholus atopus, distantly related to Tyrannosaurus rex and closely resembled South American predatory dinosaurs, have been discovered.
- D. A distant relative of Tyrannosaurus rex, bearing a close resemblance to South American predatory dinosaurs is Majungatholus atopus, a meat-eating dinosaur, the bones of which have been discovered in Madagascar.
- E. A distant relative of Tyrannosaurus rex and closely resembling South American predatory dinosaurs, the bones of a meat-eating dinosaur, Majungatholus atopus, have been discovered in Madagascar.

11. In her 26 years in the forests of Gombe, Jane Goodall collected data that proved that chimpanzees exhibit the kind of curiosity so that new patterns of behavior and expression can be passed on from each one to others by imitating and practicing.
- A. exhibit the kind of curiosity so that new patterns of behavior and expression can be passed on from each one to others by imitating and practicing
 - B. will exhibit the kind of curiosity so that new patterns of behavior and expression can be passed on from one to another by imitating and practicing
 - C. will exhibit the kind of curiosity so that new patterns of behavior and expression can be passed on from each one to another by imitation and practice
 - D. exhibit the kind of curiosity by which new patterns of behavior and expression can be passed on from each one to others by imitating and practicing
 - E. exhibit the kind of curiosity where new patterns of behavior and expression are passed on to others by imitation and practice

In large part as a consequence of the feminist movement, historians have focused a great deal of attention in recent years on determining more accurately the status of women in various periods. Although much has been accomplished for the modern period, premodern cultures have proved more difficult: sources are restricted in number, fragmentary, difficult to interpret, and often contradictory. Thus it is not particularly surprising that some earlier scholarship concerning such cultures has so far gone unchallenged. An example is Johann Bachofen's 1861 treatise on Amazons, women-ruled societies of questionable existence contemporary with ancient Greece.

Starting from the premise that mythology and legend preserve at least a nucleus of historical fact, Bachofen argued that women were dominant in many ancient societies. His work was based on a comprehensive survey of references in the ancient sources to Amazonian and other societies with matrilineal customs—societies in which descent and property rights are traced through the female line. Some support for his theory can be found in evidence such as that drawn from Herodotus, the Greek "historian" of the fifth century B. C., who speaks of an Amazonian society, the Sauromatae, where the women hunted and fought in wars. A woman in this society was not allowed to marry until she had killed a person in battle.

Nonetheless, this assumption that the first recorders of ancient myths have preserved facts is problematic. If one begins by examining why ancients refer to Amazons, it becomes clear that ancient Greek descriptions of such societies were meant not so much to represent observed historical fact—real Amazonian societies—but rather to offer "moral lessons" on the supposed outcome of women's rule in their own society. The Amazons were often characterized, for example, as the equivalents of giants and centaurs, enemies to be slain by Greek heroes. Their customs were presented not as those of a respectable society, but as the very antitheses of ordinary Greek practices.

Thus, I would argue, the purpose of accounts of the Amazons for their male Greek recorders was didactic, to teach both male and female Greeks that all-female groups, formed by withdrawal from traditional society, are destructive and dangerous. Myths about the Amazons were used as arguments for the male-dominated status quo, in which groups composed exclusively of either sex were not permitted to segregate themselves permanently from society. Bachofen was thus misled in his reliance on myths for information about the status of women. The sources that will probably tell contemporary historians most about women in the ancient world are such social documents as gravestones, wills, and marriage contracts. Studies of such documents have already begun to show how mistaken we are when we try to derive our picture of the ancient world exclusively from literary sources, especially myths.

12. The primary purpose of the passage is to
 - (A) compare competing new approaches to understanding the role of women in ancient societies
 - (B) investigate the ramifications of Bachofen's theory about the dominance of women in ancient societies
 - (C) explain the burgeoning interest among historians in determining the actual status of women in various societies
 - (D) analyze the nature of Amazonian society and uncover similarities between it and the Greek world
 - (E) criticize the value of ancient myths in determining the status of women in ancient societies
13. Which of the following can be inferred from the passage about the myths recorded by the ancient Greeks?
 - I. They sometimes included portrayals of women holding positions of power.
 - II. They sometimes contained elaborate explanations of inheritance customs.
 - III. They comprise almost all of the material available to historians about ancient Greece.
 - (A) I only
 - (B) III only
 - (C) I and III only
 - (D) II and III only
 - (E) I, II, and III
14. It can be inferred from the passage that the probable reactions of many males in ancient Greece to the idea of a society ruled by women could best be characterized as
 - (A) confused and dismayed
 - (B) wary and hostile
 - (C) cynical and disinterested
 - (D) curious but fearful
 - (E) excited but anxious
15. The author's attitude toward Bachofen's treatise is best described as one of
 - (A) qualified approval
 - (B) profound ambivalence
 - (C) studied neutrality
 - (D) pointed disagreement
 - (E) unmitigated hostility

16. Anders: The physical structure of the brain plays an important role in thinking. So researchers developing “thinking machines”—computers that can make decisions based on both common sense and factual knowledge—should closely model those machines on the structure of the brain.

Yang: Important does not mean essential. After all, no flying machine closely modeled on birds has worked; workable aircraft are structurally very different from birds. So **thinking machines closely modeled on the brain are also likely to fail**. In developing a workable thinking machine, researchers would therefore increase their chances of success if they focus on the brain’s function and simply ignore its physical structure.

The **BOLDFACE** portion serves which one of the following roles in yang’s argument?

- (A) the main conclusion of the argument
 - (B) a subsidiary conclusion used in support of the main conclusion
 - (C) a principle of research invoked in support of the conclusion
 - (D) a particular example illustrating a general claim
 - (E) background information providing a context for the argument
17. In the above passage, in evaluating Yang’s argument it would be most helpful to know whether
- (A) studies of the physical structure of birds provided information crucial to the development of workable aircraft
 - (B) researchers currently working on thinking machines take all thinking to involve both common sense and factual knowledge
 - (C) as much time has been spent trying to develop a workable thinking machine as had been spent in developing the first workable aircraft
 - (D) researchers who specialize in the structure of the brain are among those who are trying to develop thinking machines
 - (E) some flying machines that were not closely modeled on birds failed to work
18. Most land-dwelling vertebrates have rotating limbs terminating in digits, a characteristic useful for land movement. Biologists who assume that this characteristic evolved only after animals abandoned aquatic environments must consider the Acanthostega, a newly discovered ancestor of all land vertebrates. It possessed rotating limbs terminating in digits, but its skeleton was too feeble for land movement. It also breathed using only internal gills, indicating that it and its predecessors were exclusively aquatic.

The statements above, if true, most strongly support which one of the following?

- (A) Many anatomical characteristics common to most land animals represent a disadvantage for survival underwater.
- (B) None of the anatomical characteristics common to most aquatic animals represent an advantage for survival on land.
- (C) Acanthostega originated as a land-dwelling species; but evolved gills only after moving to an underwater environment.
- (D) All anatomical characteristics not useful for land movement but common to most land animals represent an advantage for survival underwater.
- (E) Certain anatomical characteristics common to some aquatic animals represent an advantage for survival on land.

19. One reason why European music has had such a strong influence throughout the world, and why it is a sophisticated achievement, is that over time the original function of the music—whether ritual, dance, or worship—gradually became an aspect of its style, not its defining force. Dance music could stand independent of dance, for example, and sacred music independent of religious worship, because each composition has so much internal coherence that the music ultimately depends on nothing but itself.
- The claims made above are compatible with each of the following EXCEPT:
- (A) African music has had a more powerful impact on the world than European music has had.
 - (B) European military and economic expansionism partially explains the global influence of European music.
 - (C) The original functions of many types of Chinese music are no longer their defining forces.
 - (D) Music that is unintelligible when it is presented independently of its original function tends to be the most sophisticated music.
 - (E) Some works of art lose their appeal when they are presented to serve a function other than their original one.
20. Because Miranda, the smallest moon of Uranus, has a large number of different surface features, including craters, mountains, valleys, and fractures, some astronomers suggest that at one time repeated impacts broke the surface apart, and after which the fragments were subsequently rejoined because of mutual gravitational attraction.
- A. repeated impacts broke the surface apart, and after which the fragments were subsequently rejoined because of
 - B. repeated impacts on the surface broke it apart, after which the fragments having rejoined with
 - C. through repeated impacts that the surface broke apart, after which the fragments subsequently rejoined by
 - D. the surface broke apart with repeated impacts, after which the fragments having rejoined through
 - E. the surface broke apart as a result of repeated impacts, after which the fragments rejoined through
21. The fact of some fraternal twins resembling each other greatly and others looking quite dissimilar highlights an interesting and often overlooked feature of fraternal-twin pairs, namely they vary considerably on a spectrum of genetic relatedness.
- A. The fact of some fraternal twins resembling each other greatly and others looking quite dissimilar highlights an interesting and often overlooked feature of fraternal-twin pairs, namely they vary considerably
 - B. That some fraternal twins resemble each other greatly while others look quite dissimilar highlights an interesting and often overlooked feature of fraternal-twin pairs, namely that they vary considerably
 - C. With some fraternal twins resembling each other greatly and others looking quite dissimilar, it highlights an interesting and often overlooked feature of fraternal-twin pairs, namely considerable variation
 - D. With some fraternal twins resembling each other greatly and others looking quite dissimilar, it is a fact that highlights an interesting and often overlooked feature of fraternal-twin pairs, namely a considerable variation
 - E. Because some fraternal twins resemble each other greatly and others look quite dissimilar, this fact highlights an interesting and often overlooked feature of fraternal-twin pairs, namely they vary considerably

22. An anthropologist hypothesized that a certain medicinal powder contained a significant amount of the deadly toxin T. When the test she performed for the presence of toxin T was negative, the anthropologist did not report the results. A chemist who nevertheless learned about the test results charged the anthropologist with fraud. The anthropologist, however, countered that those results were invalid because the powder had inadvertently been tested in acidic solution.

Which one of the following, if true, most strengthens the anthropologist's counterargument?

- (A) The anthropologist had evidence from fieldwork that the medicinal powder was typically prepared using toxin T.
 - (B) The activity level of toxin T tends to decline if the powder is stored for a long time.
 - (C) When it is put into an acidic solution, toxin T becomes undetectable.
 - (D) A fresh batch of powder for a repeat analysis was available at the time of the test.
 - (E) The type of analysis used was insensitive to very small amounts of toxin T.
23. Pundit: The only airline providing service for our town announces that because the service is unprofitable, it will discontinue this service next year. Town officials have urged the community to use the airline's service more frequently so that the airline will change its decision. There is no reason to comply with their recommendation, however, for just last week these same officials drove to an out-of-town conference instead of flying.
- The Pundit's reasoning is most vulnerable to criticism on the grounds that it presumes, without providing justification, that
- (A) Increasing the number of tickets sold without increasing ticket prices will be sufficient to make continued air service economically feasible.
 - (B) Suspending service and losing money by continuing service are the airline's only options.
 - (C) The town officials paid for their trip with taxpayers' money rather than their own money.
 - (D) Ground transportation is usually no less expensive than airplane transportation.
 - (E) If the town officials did not follow their own advice, then that advice is not worth following.

24. Some scientists believe that 65 million years ago an asteroid struck what is now the Yucatan Peninsula, thereby causing extinction of the dinosaurs. These scientists have established that such a strike could have hurled enough debris into the atmosphere to block sunlight and cool the atmosphere. Without adequate sunlight, food sources for herbivorous dinosaurs would have disappeared, and no dinosaurs could have survived a prolonged period of low temperatures. These same scientists, however, have also established that most debris launched by the asteroid would have settled to the ground within six months, too soon for the plants to disappear or the dinosaurs to freeze.

Which one of the following, if true, most helps to resolve the apparent discrepancy between the scientists' beliefs and the scientists' results, as described above?

- (A) Loss of the herbivorous dinosaurs would have deprived the carnivorous dinosaurs of their food source.
- (B) Dinosaurs inhabited most landmasses on the planet but were not especially abundant in the area of the asteroid strike.
- (C) A cloud of debris capable of diminishing sunlight by 20 percent would have cooled the earth's surface by 7 to 10 degrees Celsius.
- (D) The asteroid was at least 9.6 km in diameter, large enough for many dinosaurs to be killed by the strike itself and by subsequent tidal waves.
- (E) Dinosaurs were susceptible to fatal respiratory problems caused by contamination of the air by asteroid debris.

25. Thirty years ago, the percentage of the British people who vacationed in foreign countries was very small compared with the large percentage of the British population who travel abroad for vacations now. Foreign travel is, and always has been, expensive from Britain. Therefore, British people must have, on average, more money to spend on vacations now than they did 30 years ago.

The argument requires assuming which one of the following?

- (A) If foreign travel had been less expensive 30 years ago, British people would still not have had enough money to take vacation abroad.
- (B) If travel to Britain were less expensive, more people of other countries would travel to Britain for their vacations.
- (C) If the percentage of British people vacationing abroad was lower 30 years ago, then the British people of 30 years ago must have spent more money on domestic vacations.
- (D) If more of the British people 30 years ago had had enough money to vacation abroad, more would have done so.
- (E) If British people are now wealthier than they were 30 years ago, then they must have more money to spend on vacations now than they did 30 years ago.

26. In order to determine automobile insurance premiums for a driver, insurance companies calculate various risk factors; as the risk factors increase, so does the premium. Certain factors, such as the driver's age and past accident history, play an important role in these calculations. Yet these premiums should also increase drives. After all, a person's chance of being involved in a mishap increases in proportion to the number of times that person drives.

Which one of the following, if true, most undermines the argument?

- (A) People who drive in frequently are more likely to be involved accidents that occur on small roads than in highway accidents.
- (B) People who drive infrequently are less likely to follow rules for safe driving than are people who drive frequently.
- (C) People who drive infrequently are less likely to violate local speed limits than are people who drive frequently.
- (D) People who drive frequently are more likely to make long-distance trips in the course of a year than are people who drive infrequently.
- (E) People who drive frequently are more likely to become distracted while driving than are people who drive infrequently.

27. Pioneered by scientists at Los Alamos National Laboratory, BEAM robots are not programmed to walk; instead they use brainlike circuits called neural networks to learn to walk through trial and error.

- A. BEAM robots are not programmed to walk; instead they use brainlike circuits called neural networks to learn to walk through trial and error
- B. BEAM robots learn to walk through trial and error by using brainlike circuits called neural networks instead of by programming them
- C. BEAM robots are not being programmed to walk but instead using brainlike circuits called neural networks and learning to walk through trial and error
- D. brainlike circuits called neural networks are used instead of programming for BEAM robots learning to walk through trial and error
- E. brainlike circuits called neural networks are being used for BEAM robots that learn to walk through trial and error instead of being programmed

Geologists have long known that the Earth's mantle is heterogeneous, but its spatial arrangement remains unresolved—is the mantle essentially layered or irregularly heterogeneous? The best evidence for the layered mantle thesis is the well-established fact that volcanic rocks found on oceanic islands, islands believed to result from mantle plumes arising from the lower mantle, are composed of material fundamentally different from that of the mid-ocean ridge system, whose source, most geologists contend, is the upper mantle.

Some geologists, however, on the basis of observations concerning mantle xenoliths, argue that the mantle is not layered, but that heterogeneity is created by fluids rich in "incompatible elements" (elements tending toward liquid rather than solid state) percolating upward and transforming portions of the upper mantle irregularly, according to the vagaries of the fluids' pathways. We believe, perhaps unimaginatively, that this debate can be resolved through further study, and that the underexplored mid-ocean ridge system is the key.

28. Which of the following best expresses the main idea of the passage?
- (A) Current theories regarding the structure of the Earth's mantle cannot account for new discoveries regarding the composition of mantle xenoliths.
 - (B) There are conflicting hypotheses about the heterogeneity of the Earth's mantle because few mantle elements have been thoroughly studied.
 - (C) Further research is needed to resolve the debate among geologists over the composition of the mid-ocean ridge system.
 - (D) There is clear-cut disagreement within the geological community over the structure of the Earth's mantle.
 - (E) There has recently been a strong and exciting challenge to geologists' long-standing belief in the heterogeneity of the Earth's mantle.
29. It can be inferred from the passage that the supporters of the "layered-mantle" theory believe which of the following?
- I. The volcanic rocks on oceanic islands are composed of material derived from the lower part of the mantle.
 - II. The materials of which volcanic rocks on oceanic islands and mid-ocean ridges are composed are typical of the layers from which they are thought to originate.
 - III. The differences in composition between volcanic rocks on oceanic islands and the mid-ocean ridges are a result of different concentrations of incompatible elements.
- (A) I only
 - (B) III only
 - (C) I and II only
 - (D) II and III only
 - (E) I, II, and III
30. The authors suggest that their proposal for determining the nature of the mantle's heterogeneity might be considered by many to be
- (A) pedestrian
 - (B) controversial
 - (C) unrealistic
 - (D) novel
 - (E) paradoxical

31. More than 300 rivers drain into Siberia's Lake Baikal, which holds 20 percent of the world's fresh water, more than all the North American Great Lakes combined.
- A. More than 300 rivers drain into Siberia's Lake Baikal, which holds 20 percent of the world's fresh water, more than all the North American Great Lakes combined.
 - B. With 20 percent of the world's fresh water, that is more than all the North American Great Lakes combined, Siberia's Lake Baikal has more than 300 rivers that drain into it.
 - C. Siberia's Lake Baikal, with more than 300 rivers draining into it, it holds more of the world's fresh water than all that of the North American Great Lakes combined, 20 percent.
 - D. While more than 300 rivers drain into it, Siberia's Lake Baikal holds 20 percent of the world's fresh water, which is more than all the North American Great Lakes combined.
 - E. More than all the North American Great Lakes combined, Siberia's Lake Baikal, with more than 300 rivers draining into it, holds 20 percent of the world's fresh water.
32. Unlike crested wheatgrass, an alien species from Siberia that forms only shallow roots and produces tall above-ground shoots, native North American grasses develop an extensive root system, allowing for greater enrichment of the soil, but do not grow to be very tall.
- A. native North American grasses develop an extensive root system, allowing for greater enrichment of the soil, but do not grow to be very
 - B. native North American grasses develop an extensive root system, which allows for their greater enrichment of the soil, but without growing to be that
 - C. the root system of native North American grasses is extensive, allowing for greater enrichment of the soil, but they do not grow to be very
 - D. the root system of native North American grasses is more extensive, allowing for the greater enrichment of the soil, but these grasses do not grow to be very
 - E. the extensiveness of the root system of native North American grasses allows for their greater enrichment of the soil, but they do not grow to be that
33. In addition to her work on the Miocene hominid fossil record, Mary Leakey contributed to archaeology through her discovery of the earliest direct evidence of hominid activity and through her painstaking documentation of East African cave paintings.
- A. Mary Leakey contributed to archaeology through her discovery of the earliest direct evidence of hominid activity and through her painstaking documentation of
 - B. Mary Leakey contributed to archaeology by her discovery of the earliest direct evidence of hominid activity and painstakingly documenting
 - C. Mary Leakey was a contributor to archaeology by discovering the earliest direct evidence of hominid activity and with her painstaking documentation of
 - D. Mary Leakey's contributions to archaeology include her discovery of the earliest direct evidence of hominid activity and painstakingly documenting
 - E. Mary Leakey's contributions to archaeology include her discovering the earliest direct evidence of hominid activity and painstaking documentation of

34. People living in the undeveloped wilderness area want jobs, and commercial development of the area will create jobs. But if the new commercial development plan is carried out, the wilderness will suffer. Thus the board considering the area's future must choose between the preservation of the wilderness and the wishes of the local people.

The answer to which of the following questions would be LEAST relevant to evaluating whether the board indeed faces the choice the author says it faces?

- (A) Could commercial development be carried out under an alternative plan without damaging the wilderness?
- (B) Would commercial development of the wilderness area significantly benefit people living elsewhere?
- (C) Would the jobs created by the new development plan be filled by the local people?
- (D) Do local people support or oppose commercial development of the wilderness area?
- (E) Can job be provided without commercial development of the wilderness area?

35. Politician: All nations that place a high tax on income produce thereby a negative incentive for technological innovation, and all nations in which technological innovation is hampered inevitably fall behind in the international arms race. Those nations that, through historical accident or the foolishness of their political leadership, wind up in a strategically disadvantageous position are destined to lose their voice in the world affairs. So if a nation wants to maintain its value system and way of life, it must not allow its highest tax bracket to exceed 30 percent of income.

Each of the following, if true, weakens the politician's argument EXCEPT:

- (A) The top level of taxation must reach 45 percent before taxation begins to deter inventors and industrialists from introducing new technologies and industries.
- (B) Making a great deal of money is an insignificant factor in driving technological innovation.
- (C) Falling behind in the international arms race does not necessarily lead to a strategically less advantageous position.
- (D) Those nations that lose influence in the world community do not necessarily suffer from a threat to their value system or way of life.
- (E) Allowing one's country to lose its technological edge, especially as concerns weaponry, would be foolish rather than merely a historical accident.

The historian Frederick J. Turner wrote in the 1890's that the agrarian discontent that had been developing steadily in the United States since about 1870 had been precipitated by the closing of the internal frontier—that is, the depletion of available new land needed for further expansion of the American farming system. Not only was Turner's thesis influential at the time, it was later adopted and elaborated by other scholars, such as John D. Hicks in *The Populist Revolt* (1931). Actually, however, new lands were taken up for farming in the United States throughout and beyond the nineteenth century. In the 1890's, when agrarian discontent had become most acute, 1,100,000 new farms were settled, which was 500,000 more than had been settled during the previous decade. After 1890, under the terms of the Homestead Act and its successors, more new land was taken up for farming than had been taken up for this purpose in the United States up until that time. It is true that a high proportion of the newly farmed land was suitable only for grazing and dry farming, but agricultural practices had become sufficiently advanced to make it possible to increase the profitability of farming by utilizing even these relatively barren lands.

The emphasis given by both scholars and statesmen to the presumed disappearance of the American frontier helped to obscure the great importance of changes in the conditions and consequences of international trade that occurred during the second half of the nineteenth century. In 1869 the Suez Canal was opened and the first transcontinental railroad in the United States was completed. An extensive network of telegraph and telephone communications was spun: Europe was connected by submarine cable with the United States in 1866 and with South America in 1874. By about 1870 improvements in agricultural technology made possible the full exploitation of areas that were most suitable for extensive farming on a mechanized basis. Huge tracts of land were being settled and farmed in Argentina, Australia, Canada, and in the American West, and these areas were joined with one another and with the countries of Europe into an interdependent market system. As a consequence, agrarian depressions no longer were local or national in scope, and they struck several nations whose internal frontiers had not vanished or were not about to vanish. Between the early 1870's and the 1890's, the mounting agrarian discontent in America paralleled the almost uninterrupted decline in the prices of American agricultural products on foreign markets. Those staple-growing farmers in the United States who exhibited the greatest discontent were those who had become most dependent on foreign markets for the sale of their products. Insofar as Americans had been deterred from taking up new land for farming, it was because market conditions had made this period a perilous time in which to do so.

36. The author implies that the change in the state of the American farmer's morale during the latter part of the nineteenth century was traceable to the American farmer's increasing perception that the
 - (A) costs of cultivating the land were prohibitive within the United States
 - (B) development of the first transcontinental railroad in the United States occurred at the expense of the American farmer
 - (C) American farming system was about to run out of the new farmland that was required for its expansion
 - (D) prices of American agricultural products were deteriorating especially rapidly on domestic markets
 - (E) proceeds from the sales of American agricultural products on foreign markets were unsatisfactory
37. The author implies that, after certain territories and countries had been joined into an interdependent market system in the nineteenth century, agrarian depressions within that system
 - (A) spread to several nations, excluding those in which the internal frontier remained open
 - (B) manifested themselves in several nations, including those in which new land remained available for farming
 - (C) slowed down the pace of new technological developments in international communications and transportation
 - (D) affected the local and national prices of the nonagricultural products of several nations
 - (E) encouraged several nations to sell more of their agricultural products on foreign markets
38. The author's argument implies that, compared to the yearly price changes that actually occurred on foreign agricultural markets during the 1880's, American farmers would have most preferred yearly price changes that were
 - (A) much smaller and in the same direction
 - (B) much smaller but in the opposite direction
 - (C) slightly smaller and in the same direction
 - (D) similar in size but in the opposite direction
 - (E) slightly greater and in the same direction

39. In addition to her work on the Miocene hominid fossil record, Mary Leakey contributed to archaeology with her discovery of the earliest direct evidence of hominid activity and painstakingly documenting East African cave paintings.
- A. Leakey contributed to archaeology with her discovery of the earliest direct evidence of hominid activity and painstakingly documenting
 - B. Leakey contributed to archaeology by her discovery of the earliest direct evidence of hominid activity and by painstakingly documenting
 - C. Leakey was a contributor to archaeology with her discovery of the earliest direct evidence of hominid activity and with her painstaking documentation of
 - D. Leakey's contributions to archaeology include her discovery of the earliest direct evidence of hominid activity and her painstaking documentation of
 - E. Leakey's contributions to archaeology include her discovering the earliest direct evidence of hominid activity and painstaking documentation of
40. Lenders and building managers in the southwestern section of the city report that because of the rental market in the area being renewed, as well as the willingness of the banks to lend money being increased, apartment buildings are being rehabilitated at a pace unseen for a decade.
- A. of the rental market in the area being renewed, as well as the willingness of the banks to lend money being increased
 - B. of the renewed rental market in the area, as well as the willingness of banks to lend money increasing
 - C. of the renewed rental market in the area and the increased willingness of banks to lend money
 - D. the rental market in the area renewed and the willingness of banks to lend money increased, therefore
 - E. the rental market in the area was being renewed and banks were increasingly willing to lend money, so
41. Faulty voting equipment, confusing ballots, voter error, and problems at polling places have been cited by a new study of the 2000 United States Presidential election, which estimated that they did not count 4 million to 6 million of the 100 million votes cast.
- A. Faulty voting equipment, confusing ballots, voter error, and problems at polling places have been cited by a new study of the 2000 United States presidential election, which estimated that they did not count 4 million to 6 million of the 100 million votes cast.
 - B. Citing faulty voting equipment, confusing ballots, voter error, and problems at polling places, a new study of the 2000 United States presidential election has estimated that 4 million to 6 million of the 100 million votes cast were not counted.
 - C. Citing faulty voting equipment, confusing ballots, voter error, and problems at polling places, 4 million to 6 million of the 100 million votes cast were not counted in the 2000 United States presidential election, a new study estimates.
 - D. A new study has cited faulty voting equipment, confusing ballots, voter error, and problems at polling places in estimating that 4 million to 6 million of the 100 million votes that were cast had not been counted in the 2000 United States presidential election.
 - E. A new study of the 2000 United States presidential election, citing faulty voting equipment, confusing ballots, voter error, and problems at polling places, has estimated 4 million to 6 million votes had not been counted of the 100 million votes cast.

Quant Answer-keys

1. E
2. D
3. E
4. A
5. A
6. E
7. C
8. C
9. A
10. A
11. C
12. D
13. C
14. C
15. C
16. B
17. D
18. C
19. E
20. B
21. C
22. A
23. E
24. B
25. B
26. E
27. B
28. E
29. D
30. B
31. C
32. B
33. E
34. D
35. A
36. C
37. D

Verbal Answer-keys

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

- 14. B
- 15. D
- 16. B
- 17. A
- 18. E
- 19. D
- 20. E
- 21. B
- 22. C
- 23. E
- 24. E
- 25. D
- 26. B
- 27. A
- 28. D
- 29. C
- 30. A
- 31. A
- 32. A
- 33. A
- 34. B
- 35. E
- 36. E
- 37. B
- 38. D
- 39. D
- 40. C
- 41. B