GRE Model Question Paper 1

Time Allowed : 1 Hour 58 Minutes	**Maximum Marks :** 340

General Instructions

Read the following instructions very carefully and strictly follow them:

1. There is no penalty for incorrect answers on the Verbal Reasoning and Quantitative Reasoning sections. This means you should always answer every question, even if you have to guess.
2. Within any section of the test, you can mark questions you want to review and change your answers as long as the time for that section has not expired.
3. The Analytical Writing section is always presented first. The Verbal Reasoning and Quantitative Reasoning sections may appear in any order after the essay.
4. The test is taken on a computer, and test-takers are provided with scratch paper or a small whiteboard for notes.
5. The Quantitative Reasoning section includes an on-screen calculator.
6. There are no breaks during the test. Leaving your seat at any point will not stop the timer for the current section.

SECTION 1
Time: 30 Minutes
38 Questions

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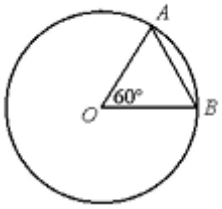
1. $5y = 15$
$x = 2y$
Column A: x
Column B: 5

2.



O is the center of the circle and the perimeter of ΔAOB is 6. The angle $\angle AOB$ is $60°$.

Column A: The circumference of the circle
Column B: 12

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3. Ken's monthly take-home pay is w dollars. After he pays for food and rent, he has x dollars left.
Column A: x
Column B: $w - x$

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4. Column A: $\frac{13}{15} + \frac{7}{8} + \frac{3}{4}$
Column B: 3

---

5. $(x - 2y)(x + 2y) = 4$
Column A: $x^2 - 4y^2$
Column B: 8

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6. Column A: $\frac{0.3}{1.5}$
Column B: $\frac{2}{10}$

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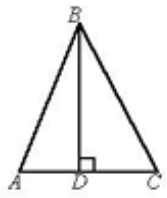
7. The operation $\diamondsuit$ is defined for all positive numbers r and t by $r \diamondsuit t = \frac{(r-t)^2+rt}{t}$.
Column A: $71 \diamondsuit 37$
Column B: $37 \diamondsuit 71$

8.



Column A: $\frac{BD}{AB}$
Column B: $\frac{DC}{BC}$

9. Column A: $(250)(492)$
Column B: $\frac{492{,}000}{4}$

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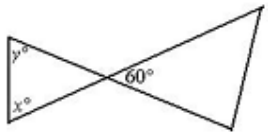
10. 

Column A: x
Column B: y

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11. Column A: The number of prime numbers between 70 and 76
Column B: The number of prime numbers between 30 and 36

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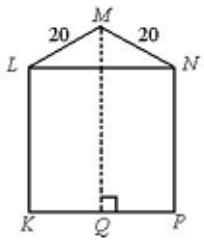
12. $6<x<7$
$y = 8$
Column A: $\frac{x}{y}$
Column B: 0.85

---

13. 

KLNP is a square with a perimeter of 128.
Column A: MQ
Column B: 42

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14. Column A: $\frac{2+3x}{2}$
Column B: $1 + 3x$

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15. The median salary for professional group A is $40,610. The median salary for professional group B is $40,810. :
Column A: The median salary for groups A and B combined
Column B: $40,710

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16. The water level in a tank is lowered by 6 inches, then raised by $8\frac{1}{2}$ inches, and then lowered by 4 inches. If the water level was x inches before the changes in level, which of the following represents the water level, in inches, after the changes?

(A) $x - 1\frac{1}{2}$
(B) $x + 1\frac{1}{2}$
(C) $x - 6\frac{1}{2}$
(D) $x + 6\frac{1}{2}$
(E) $x - 18\frac{1}{2}$

---

17. In the figure above, M, N, and P are midpoints of the sides of an equilateral triangle whose perimeter is 18. What is the perimeter of the shaded region?

(A) 2
(B) 3
(C) $4\frac{1}{2}$
(D) 6
(E) 9

---

18. Which of the following sets of numbers has the greatest standard deviation?

(A) 2, 3, 4
(B) 2.5, 3, 3.5
(C) 1, 1.25, 1.5
(D) -2, 0, 2
(E) 20, 21, 21.5

---

19. If x, y, and z represent consecutive integers, and x <y <z, which of the following equals y?

I. $x + 1$
II. $\frac{x+z}{2}$
III. $\frac{x+y+z}{3}$

(A) I only
(B) I and II only
(C) I and III only
(D) II and III only
(E) I, II and III

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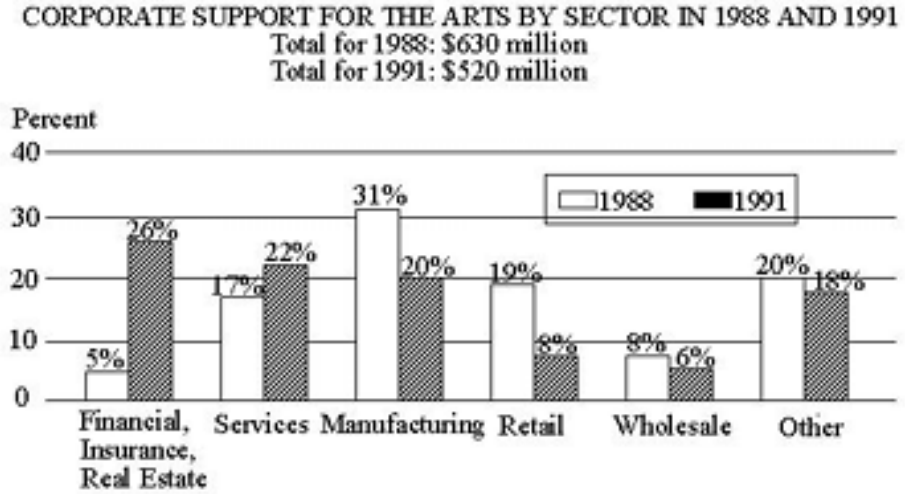
20. When 9 students took a zoology quiz with a possible score of 0 to 10, inclusive, their average (arithmetic mean) score was 7.5. If a tenth student takes the same quiz, what will be the least possible average score on the quiz for all 10 students?

(A) 6.5
(B) 6.75
(C) 7.0
(D) 7.25
(E) 7.5

Questions 21-25 refer to the following graph.



21. The two corporate sectors that increased their support for the arts from 1988 to 1991 made a total contribution in 1991 of approximately how many million dollars?

(A) 112
(B) 125
(C) 200

(D) 250
(E) 315

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22. How many of the six corporate sectors listed each contributed more than $60 million to the arts in both 1988 and 1991?

(A) One
(B) Two
(C) Three
(D) Four
(E) Five

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23. Approximately how many million dollars more did the wholesale sector contribute to the arts in 1988 than in 1991?

(A) 10.4
(B) 12.6
(C) 14.0
(D) 16.5
(E) 19.2

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24. From 1988 to 1991, which corporate sector decreased its support for the arts by the greatest dollar amount?

(A) Services
(B) Manufacturing
(C) Retail
(D) Wholesale
(E) Other

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25. Of the retail sector's 1991 contribution to the arts, $\frac{1}{4}$ went to symphony orchestras and $\frac{1}{2}$ of the remainder went to public television. Approximately how many million dollars more did the retail sector contribute to public television that year than to symphony orchestras?

(A) 5.2
(B) 6.3
(C) 10.4

(D) 13.0
(E) 19.5

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26. If $x = a^3$ and $y = a^7$, where $a \neq 0$, which of the following is equivalent to a^{13}?

(A) xy
(B) x^2y
(C) $\frac{x^3}{y}$
(D) $\frac{x^4}{y}$
(E) $\frac{y^3}{x}$

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27. The probabilities that each of two independent experiments will have a successful outcome are $\frac{8}{15}$ and $\frac{2}{3}$, respectively. What is the probability that both experiments will have successful outcomes?
(A) $\frac{4}{5}$
(B) $\frac{6}{5}$
(C) $\frac{2}{15}$
(D) $\frac{16}{45}$
(E) $\frac{64}{225}$

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28. If x is 1, 2, or 3 and y is either 2 or 4, then the product xy can have how many different possible values?

(A) Three
(B) Four
(C) Five
(D) Six
(E) Seven

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29. If the radius of a circular region were decreased by 20 percent, the area of the circular region would decrease by what percent?

(A) 16%
(B) 20%

(C) 36%
(D) 40%
(E) 44%

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30. Workers at Companies X and Y are paid the same base hourly rate. Workers at company X are paid 1.5 times the base hourly rate for each hour worked per week in excess of the first 37, while workers at Company Y are paid 1.5 times the base hourly rate for each hour worked per week in excess of the first 40. In a given week, how many hours must a Company X worker work in order to receive the same pay as a company Y worker who works 46 hours?

(A) 46
(B) 45
(C) 44
(D) 43
(E) 42

SECTION 2
Time: 30 Minsutes
38 Questions

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1. As businesses become aware that their advertising must —— the everyday concerns of consumers, their commercials will be characterized by a greater degree of ——.
(A) allay...pessimism
(B) address...realism
(C) evade....verisimilitude
(D) engage...fancy
(E) change...sincerity

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2. Because the lawyer's methods were found to be ——, the disciplinary committee —— his privileges.
(A) unimpeachable...suspended
(B) ingenious...withdrew
(C) questionable...expanded
(D) unscrupulous...revoked
(E) reprehensible...augmented

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3. People of intelligence and achievement can nonetheless be so —— and lacking in —— that they gamble their reputations by breaking the law to further their own ends.
(A) devious...propensity
(B) culpable...prosperity
(C) obsequious...deference
(D) truculent... independence
(E) greedy... integrity

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4. A number of scientists have published articles —— global warming, stating —— that there is no solid scientific evidence to support the theory that the Earth is warming because of increases in greenhouse gases.
(A) debunking...categorically
(B) rejecting...paradoxically
(C) deploring...optimistically
(D) dismissing...hesitantly
(E) proving...candidly

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5. The senator's attempt to convince the public that she is not interested in running for a second term is as —— as her opponent's attempt to disguise his intention to run against her.
(A) biased
(B) unsuccessful
(C) inadvertent
(D) indecisive
(E) remote

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6. MacCrory's conversation was ——: she could never tell a story, chiefly because she always forgot it, and she was never guilty of a witticism, unless by accident.
(A) scintillating
(B) unambiguous
(C) perspicuous
(D) stultifying
(E) facetious

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7. Despite its many ——, the whole-language philosophy of teaching reading continues to gain —— among educators.
(A) detractors...notoriety

(B) adherents...prevalence
(C) critics...currency
(D) enthusiasts...popularity
(E) practitioners... credibility

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8. CENSUS : POPULATION::
(A) interrogation : guilt
(B) survey : price
(C) interview : personality
(D) questionnaire : explanation
(E) inventory : stock

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9. AUTHENTICITY : FRAUDULENT::
(A) morality : utopian
(B) intensity : vigorous
(C) sincerity : hypocritical
(D) particularity : unique
(E) plausibility : narrated

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10. VARNISH : GLOSSY::
(A) sharpen : blunt
(B) measure : deep
(C) sand : smooth
(D) approximate : precise
(E) anchor : unstable

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11. AMENITY : COMFORTABLE::
(A) tact : circumspect
(B) nuisance aggravated
(C) honorarium grateful
(D) favorite: envious
(E) lounge patient

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12. PAIN : ANALGESIC::
(A) energy revitalization
(B) interest: stimulation

(C) symptom palliative
(D) despair: anxiety
(E) reward: incentive

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13. VOICE : SHOUT::
(A) ear overhear
(B) eye: see
(C) hand clutch
(D) nerve: feel
(E) nose inhale

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14. PONTIFICATE : SPEAK::
(A) strut: walk
(B) stare: look
(C) patronize frequent
(D) eulogize: mourn
(E) reciprocate give

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15. BIBLIOPHILE : BOOKS::
(A) environmentalist: pollution
(B) zoologist animals
(C) gourmet: food
(D) calligrapher: handwriting
(E) aviator aircraft

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16. INDIGENT : WEALTH::
(A) presumptuous: independence
(B) imperturbable determination
(C) inevitable: inescapability
(D) indigestible: sustenance
(E) redundant: indispensability

Passage for questions 17-23

This passage is based on an article published in 1990.

Eight times within the past million years, something in the Earth's climatic equation has changed. allowing snow in the mountains and the northern Line latitudes to accumulate from one season to the next instead of melting away. Each time, the enormous ice sheets resulting from this continual buildup lasted tens of thousands of years until the end of each particular glacial cycle brought a warmer climate. Scientists speculated that these glacial cycles were ultimately driven by astronomical factors: slow, cyclic changes in the eccentricity of the Earth's orbit and in the tilt and orientation of its spin axis. But up until around 30 years ago, the lack of an independent record of ice- age timing made the hypothesis untestable.

Then in the early 1950's Emiliani produced the first complete record of the waxings and wanings of past glaciations. It came from a seemingly odd place. the seafloor. Single-cell marine organisms called "foraminifera" house themselves in shells made from calcium carbonate. When the foraminifera die. sink to the bottom, and become part of seafloor sedi- ments, the carbonate of their shells preserves certain characteristics of the seawater they inhabited. In particular, the ratio of a heavy, isotope of oxygen (oxygen-18) to ordinary oxygen (oxygen- 16) in the carbonate preserves the ratio of the two oxygens in water molecules.

It is now understood that the ratio of oxygen iso- topes in seawater closely reflects the proportion of the world's water locked up in glaciers and ice sheets. A kind of meteorological distillation accounts for the link. Water molecules containing the heavier isotope tend to condense and fall as precipitation slightly sooner than molecules containing the lighter isotope. Hence, as water vapor evaporated from warm oceans moves away from its source. its oxygen -18 returns more quickly to the oceans than does its oxygen-16. What falls as snow on distant ice sheets and mountain glaciers is relatively depleted of oxygen -18. As the oxygen-18-poor ice builds up the oceans become relatively enriched in the Isotope. The larger the ice sheets grow, the higher the proportion of oxygen-18 becomes in seawater- and hence in the sediments.

Analyzing cores drilled from seafloor sediments, Emiliani found that the isotopic ratio rose and fell in rough accord with the Earth's astronomical cycles. Since that pioneering observation, oxygen-isotope measurements have been made on hundreds of cores. A chronology for the combined record enables scientists to show that the record contains the very same periodicities as the orbital processes. Over the past 800,000 years, the global ice volume has peaked every 100,000 years, matching the period of the orbital eccentricity variation. In addition, "wrinkles" superposed on each cycle –small decreases or surges in ice volume – have come at intervals of roughly 23,000 and 41,000 years, in keeping with the pre- cession and tilt frequencies of the Earth's spin axis.

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17. Which of the following best expresses the main idea of the passage?

(A) Marine sediments have allowed scientists to amass evidence tending to confirm that astronomical cycles drive the Earth's glacial cycles.
(B) the ratio between two different isotopes of oxygen in seawater correlates closely with the size of the Earth's ice sheets.
(C) Surprisingly, single-cell marine organisms provide a record of the Earth's ice ages.
(D) The Earth's astronomical cycles have recently been revealed to have an unexpectedly large impact on the Earth's climate.
(E) The earth has experienced eight periods of intense glaciation in the past million years,

primarily as a result of substantial changes in its orbit.

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18. The passage asserts that one reason that oceans become enriched in oxygen-18 as ice sheets grow is because

(A) water molecules containing oxygen-18 condense and fall as precipitation slightly sooner than those containing oxygen-16

(B) the ratio of oxygen-18 to oxygen-16 in water vapor evaporated from oceans is different from that of these isotopes in seawater

(C) growing ice sheets tend to lose their oxygen-18 as the temperature of the oceans near them gradually decreases

(D) less water vapor evaporates from oceans during glacial periods and therefore less oxygen-18 is removed from the seawater

(E) the freezing point of seawater rich in oxygen-18 is slightly lower than that of seawater poor in oxygen-18

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19. According to the passage, the large ice sheets typical of glacial cycles are most directly caused by

(A) changes in the average temperatures in the tropics and over open oceans

(B) prolonged increases in the rate at which water evaporates from the oceans

(C) extreme seasonal variations in temperature in northern latitudes and in mountainous areas

(D) steadily increasing precipitation rates in northern latitudes and in mountainous areas

(E) the continual failure of snow to melt completely during the warmer seasons in northern latitudes and in mountainous areas

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20. It can be inferred from the passage that which of the following is true of the water locked in glaciers and ice sheets today?

(A) It is richer in oxygen-18 than frozen water was during past glacial periods.

(B) It is primarily located in the northern latitudes of the Earth.

(C) Its ratio of oxygen isotopes is the same as that prevalent in seawater during the last ice age.

(D) It is steadily decreasing in amount due to increased thawing during summer months.

(E) In comparison with seawater, it is relatively poor in oxygen-18.

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21. The discussion of the oxygen-isotope ratios in paragraph three of the passage suggests that which of the following must be assumed if the conclusions described in lines 49-58 are to be validly drawn?

(A) The Earth's overall annual precipitation rates do not dramatically increase or decrease over time.

(B) The various chemicals dissolved in seawater have had the same concentrations over the past million years.
(C) Natural processes unrelated to ice formation do not result in the formation of large quantities of oxygen-18.
(D) Water molecules falling as precipitation usually fall on the open ocean rather than on continents.
(E) Increases in global temperature do not increase the amount of water that evaporates from the oceans.

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22. The passage suggests that the scientists who first constructed a coherent, continuous picture of past variations in marine-sediment isotope ratios did which of the following?
(A) Relied primarily on the data obtained from the analysis of Emiliani's core samples.
(B) Combined data derived from the analysis of many different core samples.
(C) Matched the data obtained by geologists with that provided by astronomers.
(D) Evaluated the isotope-ratio data obtained in several areas in order to eliminate all but the most reliable data.
(E) Compared data obtained from core samples in many different marine environments with data samples derived from polar ice caps.

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23. The passage suggests that the scientists mentioned in line 8 considered their reconstruction of past astronomical cycles to be
(A) unreliable because astronomical observations have been made and recorded for only a few thousand years
(B) adequate enough to allow that reconstruction's use in explaining glacial cycles if a record of the latter could be found
(C) in need of confirmation through comparison with an independent source of information about astronomical phenomena
(D) incomplete and therefore unusable for the purposes of explaining the causes of ice ages
(E) adequate enough for scientists to support conclusively the idea that ice ages were caused by astronomical changes

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Passage for questions 24-26

Although Victor Turner's writings have proved fruitful for fields beyond anthropology, his definition of ritual is overly restrictive. Ritual, he says, is "pre- list scribed formal behavior for occasions not given over to technological routine, having reference to beliefs in mystical beings or powers", " Technological routine" refers to the means by which a social group provides for its material needs. Turner's differentiating ritual from technology helps us recognize that festivals and celebrations may have little purpose other than play, but it obscures the practical aims,

such as making crops grow or healing patients, of other rituals.

Further, Turner's definition implies a necessary relationship between ritual and mystical beliefs. However, not all rituals are religious; some religions have no reference to mystical beings; and individuals may be required only to participate in, not necessarily believe in, a ritual. Turner's assumption that ritual behavior follows belief thus limits the usefulness of his definition in studying ritual across cultures.

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24. According to the passage, which of the following does Turner exclude from his conception of ritual?
(A) Behavior based on beliefs
(B) Behavior based on formal rules
(C) Celebrations whose purpose is play
(D) Routines directed toward practical ends
(E) Festivals honoring supernatural beings

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25. The passage suggests that an assumption underlying Turner's definition of ritual is that
(A) anthropological concepts apply to other fields
(B) festivals and ceremonies are related cultural phenomena
(C) there is a relationship between play and practical ends
(D) rituals refer only to belief in mystical beings or powers
(E) mystical beings and powers have certain common attributes across cultures

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26. It can be inferred that the author of the passage believes each of the following concerning rituals EXCEPT:
(A) Some are unrelated to religious belief.
(B) Some are intended to have practical consequences.
(C) Some have no purpose other than play.
(D) They sometimes involve reference to mystical beings.
(E) They are predominantly focused on agricultural ends.

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27. Which of the following best describes the organization of the passage?
(A) Factual data are presented and a hypothesis is proposed.
(B) A distinction is introduced then shown not to be a true distinction.
(C) A statement is quoted, and two assumptions on which it is based are clarified.
(D) A definition is challenged, and two reasons for the challenge are given.
(E) An opinion is offered and then placed within a historical framework.

28. SLOUCH:
(A) stand erect
(B) move unhesitatingly
(C) stretch languidly
(D) scurry
(E) totter

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29. CLAIM:
(A) renounce
(B) repeal
(C) deter
(D) hinder
(E) postpone

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30. EXPEDITE:
(A) impeach
(B) deflect
(C) resist
(D) retard
(E) remove

SECTION 3
Time: 30 Minutes
25 Questions

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1. VALEDICTION:
(A) greeting
(B) promise
(C) accusation
(D) denigration
(E) aphorism

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2. FACTORABLE
(A) absorbent
(B) magnifiable
(C) simulated

(D) irreducible
(E) ambiguous

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3. CONVOKE:
(A) disturb
(B) impress
(C) adjourn
(D) extol
(E) applaud

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4. REND:
(A) sink
(B) unite
(C) find
(D) spend
(E) unleash

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5. CONTRAVENE:
(A) condescend
(B) embark
(C) support
(D) offend
(E) amass

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6. NADIR:
(A) summit
(B) impasse
(C) sanctuary
(D) weak point
(E) direct route

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7. ABSTRACT:
(A) deny
(B) organize
(C) elaborate
(D) deliberate

(E) produce

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8. MENDACIOUS:
(A) assured
(B) honest
(C) intelligent
(D) fortunate
(E) gracious

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9. Mayor: Four years ago when we reorganized the city police department in order to save money, critics claimed that the reorganization would make the police less responsive to citizens and would thus lead to more crime. The police have compiled theft statistics from the years following the reorganization that show that the critics were wrong. There was an overall decrease in reports of thefts of all kinds, including small thefts.

Which of the following, if true, most seriously challenges the mayor's argument?

(A) When city police are perceived as unresponsive, victims of theft are less likely to report thefts to the police.
(B) The mayor's critics generally agree that police statistics concerning crime reports provide the most reliable available data on crime rates.
(C) In other cities where police departments have been similarly reorganized, the numbers of reported thefts have generally risen following reorganization.
(D) The mayor's reorganization of the police department failed to save as much money as it was intended to save.
(E) During the four years immediately preceding the reorganization, reports of all types of theft had been rising steadily in comparison to reports of other crimes.

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10. It takes a particular talent to be a successful business manager. Business courses can help people to solve management problems, but such courses can do so only for those people with managerial talent. Such people should take business courses to acquire ideas that they can subsequently use to good advantage if management problems happen to arise.

If the statements above are true, which of the following must also be true on the basis of them?

(A) People who are helped by business courses in solving management problems also have managerial talent.

(B) People who are already skilled at solving management problems are unlikely to benefit from business courses.
(C) Most ideas that are used successfully in solving management problems are those acquired in business courses.
(D) People who lack managerial talent are more likely to take business courses than are people who have managerial talent.
(E) Those people who have never taken business courses are unable to solve management problems when such problems arise.

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11. When a driver is suspected of having had too much to drink, testing the driver's ability to walk a straight line gives a more reliable indication of fitness to drive than does testing the driver's blood-alcohol level.
Which of the following, if true, best supports the claim made in the statement above?
(A) Not all observers will agree whether or not an individual has succeeded in walking a straight line.
(B) Because of genetic differences and variations in acquired tolerance to alcohol, some individuals suffer more serious motor impairment from a given high blood-alcohol level than do others.
(C) Tests designed to measure blood-alcohol levels are accurate, inexpensive, and easy to administer.
(D) More than half the drivers involved in fatal accidents have blood-alcohol levels that exceed the legal limit, whereas in less-serious accidents the proportion of legally intoxicated drivers is lower.
(E) Some individuals with high blood-alcohol levels are capable of walking a straight line but are not capable of driving safely.

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12. That sales can be increased by the presence of sunlight within a store has been shown by the experience of the only Savefast department store with a large skylight. The skylight allows sunlight into half of the store, reducing the need for artificial light. The rest of the store uses only artificial light. Since the store opened two years ago, the departments on the sunlit side have had substantially higher sales than the other departments.

Which of the following, if true, most strengthens the argument?

(A) On particularly cloudy days, more artificial light is used to illuminate the part of the store under the skylight.
(B) When the store is open at night, the departments in the part of the store under the skylight have sales that are no higher than those of other departments.
(C) Many customers purchase items from departments in both parts of the store on a single shopping trip.
(D) Besides the skylight, there are several significant architectural differences between the two

parts of the store.
(E) The departments in the part of the store under the skylight are the departments that generally have the highest sales in other stores in the Savefast chain.

Information for questions 13-17

A humanities course must discuss six out of eight topics-faith, knowledge, love, madness, revolution, skepticism, technology, and utopia-one at a time, each for one of six periods numbered consecutively from 1through 6. The ordering of topics must meet these conditions:

If faith is not discussed, utopia must be discussed last.
If technology is discussed, it must be discussed immediately before or else immediately after love.
If faith is discussed, it must be discussed immediately before skepticism and immediately after madness.
Knowledge or else revolution must be discussed first.

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13. Which of the following is an acceptable sequence of topics discussed, in order from first through sixth?
(A) Knowledge, love, madness, faith, skepticism, technology
(B) Knowledge, madness, utopia, skepticism, technology
(C) Love, technology, revolution, madness, faith, skepticism
(D) Revolution, madness, faith, skepticism, love, technology
(E) Revolution, madness, skepticism, faith, technology, love

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14. If exactly one topic is discussed between faith and love, that topic could be
(A) knowledge
(B) revolution
(C) skepticism
(D) technology
(E) utopia

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15. If neither faith nor madness is discussed and if revolution is discussed fourth, then skepticism must be discussed
(A) first
(B) second
(C) third
(D) fourth
(E) fifth

16. If revolution and utopia are the first two topics discussed, the two topics not discussed could be
(A) faith and love
(B) faith and technology
(C) knowledge and skepticism
(D) love and madness
(E) love and technology

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17. If knowledge is not discussed, the other topic not discussed could be
(A) faith
(B) love
(C) madness
(D) revolution
(E) skepticism

Information for questions 18-22

A jeweler is setting eight gemstones-gamet. jade, malachite, opal. ruby, sapphire, turquoise, and zircon-around a circular bracelet. There are eight adjacent positions, numbered consecutively 1 through 8 around the bracelet, in which to set the stones, with position 8 adjacent to position 1. The setting of the stones must conform to the following conditions:

The ruby is adjacent to the zircon.
The garnet is adjacent to the zircon.
The jade is adjacent to the opal.
The jade is not adjacent to the malachite.
If the turquoise is set in position 2, the opal is set in position 3; otherwise. the opal is set in position 2.

---

18. Which of the following can be the order, from position 1 through position 8, of the stones set around the bracelet?
(A) Jade, opal, malachite, ruby, zircon, garnet, sapphire, turquoise
(B) Jade, opal, sapphire, turquoise, garnet, ruby, zircon, malachite
(C) Malachite, turquoise, opal, jade, ruby, zircon, garnet, sapphire
(D) Turquoise, opal, jade, sapphire, garnet, zircon, ruby, malachite
(E) Turquoise, sapphire, opal, jade, garnet, zircon, ruby, malachite

---

19. If the turquoise is set in position 8, which of the following must be true?
(A) The garnet is set in position 5.

(B) The jade is set in position 1.
(C) The jade is set in position 3.
(D) The malachite is set in position 1.
(E) The sapphire is set in position 1.

---

20. Which of the following is a position in which the zircon can be set?
(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

---

21. If the malachite is set in position 5, which of the following can be true?
(A) The garnet is set in position 3.
(B) The jade is set in position 4.
(C) The opal is set in position 3.
(D) The sapphire is set in position 6.
(E) The zircon is set in position 1.

---

22. If the turquoise is set in position 2, which of the following can be true?
(A) The garnet is set in position 1.
(B) The jade is set in position 1.
(C) The malachite is set in position 5.
(D) The ruby is set in position 5.
(E) The sapphire is set in position 4.

---

23. To protect beachfront buildings from ocean storms, ocean resorts have built massive seawalls between beaches and the buildings. Not only do the seawalls block off some buildings' ocean view, but the beaches themselves become ever narrower, because sand can no longer creep inland as storms erode it at the water's edge.

If the information is correct, which of the following conclusions is most strongly supported on the basis of it?

(A) Since the ferocity of ocean storms is increasing, increasingly high seawalls must be built between beaches and beachfront property.
(B) Even when beaches are heavily used by people, they are necessary to the survival of the many wild species that use them.

(C) Seawalls constructed to protect beachfront buildings will not themselves eventually be damaged by storms and will not require, if they are to protect the buildings, expensive repair or replacement.
(D) The conservation of beaches for future generations should be the overriding goal of shore management at ocean coasts.
(E) Trying to protect beachfront buildings by constructing seawalls is counterproductive in the long run for an oceanfront community wishing to maintain itself as a beach resort.

---

24. A study found that 70 percent of children surveyed in 1970 had at one time had cavities, whereas only 50 percent of those surveyed in 1985 had ever had cavities. The researchers concluded that the level of dental disease in children had declined between 1970 and 1985.

Which of the following, if true, would most seriously undermine the researchers' conclusion presented above?

(A) Cavities are the most common kind of dental disease to which children are subject.
(B) The children surveyed came from a broad variety of income backgrounds.
(C) The children surveyed were selected from among students of teachers cooperating with the researchers.
(D) The accuracy of cavity detection techniques has improved dramatically since 1970.
(E) The children surveyed in 1985 were younger on average than those surveyed in 1970.

---

25. David: Since attempting to preserve every species that is currently endangered is prohibitively expensive, the endangered species whose value to humanity is the greatest should be accorded the highest priority for preservation.

Karen: Such a policy would be unsound because it is impossible to predict the future value of a species, nor is it always possible to assess the present value of species whose contributions to humanity, though significant, are indirect.
Which of the following is the main point of Karen's reply to David?

(A) Although it would be desirable to preserve all endangered species, doing so is not economically feasible.
(B) Even if the value to humanity of a given species is known, that value should not be a factor in any decision on whether to expend effort to preserve that species.
(C) Species whose contributions to humanity are direct should have a higher priority for preservation efforts than species whose contributions to humanity are only indirect.
(D) Since the methods for deciding which species have the most value to humanity are imperfect, informed decisions cannot be made on the basis of the assessment of such value.
(E) The preservation of endangered species whose value to humanity can be reliably predicted is more important than the preservation of species whose value for humanity is unpredictable.

SECTION 4
Time: 30 Minutes
30 Questions

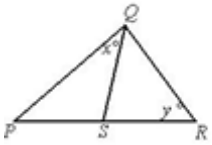
---

1. $x = y = z$
Column A: x^3
Column B: xyz

---

2. $x<0$
Column A: $3x^2$
Column B: $3x^3$

3.



PS = SR
Column A: x
Column B: y

---

4. Column A: $\frac{24}{23} + \frac{101}{100}$
Column B: 2

---

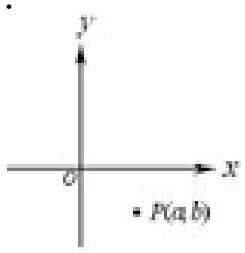
5. The points P(2,0), Q(0,2), R(4,2) and S(2,4) are in the rectangular coordinate system. :
Column A: The distance from P to Q
Column B: The distance from R to S

---

6. The probability that events E and F will both occur is 0.42. The probability that event E will occur is 0.58.
Column A: The probability that event F will occur

Column B: 0.58

7.



Column A: a
Column B: b

---

8. Column A: $(1+\sqrt{2})^2$
Column B: 3

---

9. Column A: (109)(87-14)
Column B: (109)(87)-(109)(14)

---

10. Carol's age, in years, can be expressed by reversing the digits in her father's age, in years. The sum of the digits in each age is 10.
Column A: The positive difference between Carol's age, in years, and her father's age, in years
Column B: 36

---

11. $0<p<1$
Column A: $p^4 - p^6$
Column B: $p^3 - p^5$

---

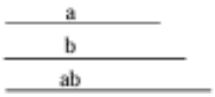
12. $3 - 2x^2 - [-x(1+2x)] = -5$
Column A: x
Column B: -8

13. a and b are positive integers.
Column A: $\frac{a}{b}$
Column B: $\frac{a+3}{b+3}$

14.

A solid cubical block of wood has dimensions as shown in the figure (3ft side), and the block is to be cut in half as indicated by the shaded region.
Column A: The total surface area of one of the resulting halves of the block
Column B: 36 square feet

15.



The lengths of the line segments are a, b, and ab, respectively. The line segments are drawn to scale.
Column A: a
Column B: 1

---

16. The average (arithmetic mean) number of students in 3 economics classes at a certain college is 24. If the total number of students in 2 of the classes combined is 38, how many students are in the remaining class?
(A) 14
(B) 19
(C) 24
(D) 31
(E) 34

---

17. If the cube of n is 180 greater than the square of n, then n =
(A) 10
(B) 9

(C) 8
(D) 7
(E) 6

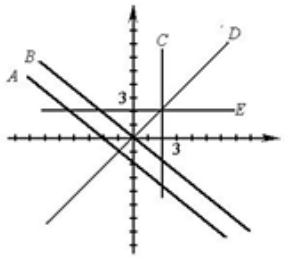
18.

The circular clock above shows a time of exactly 3:30. What is the value of x?
(A) 60
(B) 75
(C) 85
(D) 90
(E) 105

---

19. What percent of the integers between 200 and 999, inclusive, end with the digits "03"?
(A) 1%
(B) 2.5%
(C) 3%
(D) 4%
(E) 5%

20.



Which of the lines in the figure above contains only points (x,y) with x = y?
(A) A
(B) B
(C) C
(D) D
(E) E

Questions 21-25 refer to the following information about student enrollment in a certain small college.

DISTRIBUTION OF ENROLLMENT
BY CLASS AND SEX
(Total enrollment: 1,400)

	Males	Females
Freshmen	303	259
Sophomores	215	109
Juniors	182	88
Seniors	160	84
Total	860	540

PERCENT OF TOTAL ENROLLMENT
MAJORING IN EACH OF THE FOLLOWING ACADEMIC AREAS
(No student is majoring in more than one area.)

Area	Percent
Humanities	33%
Social Sciences	30%
Physical Sciences	24%

---

21. The ratio of the number of male freshmen to the number of female sophomores is approximately

(A) 2 to 1
(B) 3 to 1
(C) 3 to 2
(D) 4 to 1
(E) 5 to 3

---

22. How many of the enrolled students are not majoring in humanities, social sciences, or physical sciences?

(A) 87
(B) 122
(C) 182
(D) 230
(E) 322

---

23. Which of the following can be inferred from the tables?

I. The number of males majoring in physical sciences is greater than the number of females majoring in that area.
II. Students majoring in either social sciences or physical sciences constitute more than 50 percent of the total enrollment.
III. The ratio of the number of males to the number of females in the senior class is less than 2 to 1.

(A) I only
(B) II only
(C) I and II
(D) I and III
(E) II and III

---

24. How many students are either juniors or males or both?
(A) 678
(B) 766
(C) 948
(D) 1,130
(E) 1,312

---

25. If the total enrollment is 12 percent greater than it was five years ago, what was the total enrollment five years ago?
(A) 1,180
(B) 1,192
(C) 1,220
(D) 1,232
(E) 1,250

---

26. If the ratio of the number of English books to the number of all other books on a bookshelf is 4 to 1, what percent of the books on the bookshelf are English books?
(A) 20%
(B) 25%
(C) 50%
(D) 75%
(E) 80%

---

27. 3, 7, 9, 14, x
The numbers in the list above are ordered from least to greatest. If the average (arithmetic mean) is 2 greater than the median, what is the value of x?
(A) 22
(B) 20
(C) 17
(D) 16

(E) 15

---

28. A developer has land that has x feet of lake frontage. The land is to be subdivided into lots, each of which is to have either 80 feet or 100 feet of lake frontage. If $\frac{1}{9}$ of the lots are to have 80 feet of frontage each and the remaining 40 lots are to have 100 feet of frontage each, what is the value of x?
(A) 400
(B) 3,200
(C) 3,700
(D) 4,400
(E) 4,760

---

29. If $\frac{a}{b} = \frac{3}{2}$, which of the following must be true?
I. $\frac{b}{a} = \frac{2}{3}$
II. $\frac{a-b}{a} = \frac{1}{3}$
III. $a + b = 5$
(A) I only
(B) II only
(C) III only
(D) I and II
(E) II and III

---

30. What is the least integer value of n such that $\frac{1}{2^n} < 0.001$?
(A) 10
(B) 11
(C) 500
(D) 501
(E) there is no such least value.

SECTION 5
Time: 30 Minutes
38 Questions

---

1. That she was —— rock climbing did not diminish her —— to join her friends on a rock-climbing expedition.
(A) attracted to ...eagerness
(B) timid about ... reluctance

(C) fearful of ... determination
(D) curious about... aspiration
(E) knowledgeable about ... hope

---

2. Data concerning the effects on a small population of high concentrations of a potentially hazardous chemical are frequently used to —— the effects on a large population of lower amounts of the same chemical.
(A) verify
(B) redress
(C) predict
(D) realize
(E) augment

---

3. Conceptually, it is hard to reconcile a defense attorney's —— to ensure that false testimony is not knowingly put forward with the attorney's mandate to mount the most —— defense conceivable for the client.
(A) efforts ... cautious
(B) duty... powerful
(C) inability... eloquent
(D) failure... diversified
(E) promises... informed

---

4. The term "modern"has always been used broadly by historians, and recent reports indicate that its meaning has become more —— than ever.
(A) precise
(B) pejorative
(C) revisionist
(D) acceptable
(E) amorphous

---

5. He would —— no argument, and to this end he enjoined us to ——.
(A) brook... silence
(B) acknowledge... neglect
(C) broach... abstinence
(D) fathom... secrecy
(E) tolerate... defiance

---

6. Originally, most intellectual criticism of mass culture was —— in character, being based on the assumption that the wider the appeal, the more —— the product.
(A) unpredictable... undesirable
(B) ironic... popular
(C) extreme ... outlandish
(D) frivolous... superfluous
(E) negative ... shoddy

---

7. Surprisingly, given the dearth of rain that fell on the corn crop, the yield of the harvest was —— ; consequently, the corn reserves of the country have not been ——.
(A) inadequate... replenished
(B) encouraging... depleted
(C) compromised... salvaged
(D) abundant... extended
(E) disappointing... harmed

---

8. REPELLENT: ATTRACT::
(A) elastic: stretch
(B) sensitive: cooperate
(C) progressive: change
(D) flammable: ignite
(E) ephemeral: endure

---

9. ANARCHIST: GOVERNMENT::
(A) legislator: taxation
(B) reformer: bureaucracy
(C) jurist: law
(D) suffragist: voting
(E) abolitionist: slavery

---

10. ADMONISH: DENOUNCE::
(A) challenge: overcome
(B) reward: praise
(C) control: contain
(D) persuade: convince

(E) punish: pillory

---

11. JOKE: PUNCH LINE::
(A) sermon: congregation
(B) conceit: allegory
(C) rhetoric: persuasion
(D) conspiracy: arrest
(E) plot: denouement

---

12. VEER: DIRECTION::
(A) align: connection
(B) filter: contamination
(C) convert: belief
(D) deflect: motivation
(E) substantiate: authenticity

---

13. REPROBATE: MISBEHAVE::
(A) sycophant: fawn
(B) critic: rebuke
(C) ruffian: tease
(D) cynic: brood
(E) narcissist: covet

---

14. IMPERVIOUS: PENETRATE::
(A) ineluctable: avoid
(B) ineradicable: damage
(C) boorish: flatter
(D) irrepressible: censure
(E) disruptive: restrain

---

15. CONSENSUS: FACTIONALISM::
(A) ritual: orthodoxy
(B) reality: plausibility
(C) reason: thought
(D) clarity: confusion

(E) leadership: subordination

---

16. MARTINET: DISCIPLINE::
(A) illusionist: misdirection
(B) dilettante: commitment
(C) renegade: allegiance
(D) pedant: learning
(E) hack: writing

Benjamin Franklin established that lightning is the transfer of positive or negative electrical charge between regions of a cloud or from cloud to earth. line Such transfers require that electrically neutral clouds, with uniform charge distributions, become electrified by separation of charges into distinct regions. The greater this separation is, the greater the voltage. or electrical potential of the cloud. Scientists still do not now the precise distribution of charges in thunder-clouds nor how separation adequate to support the huge voltages typical of lightning bolts arises.

According to one theory, the precipitation hypothesis, charge separation occurs as a result of precipitation. Larger droplets in a thundercloud precipitate down- ward past smaller suspended droplets. Collisions among droplets transfer negative charge to precip- itating droplets, leaving the suspended droplets with a positive charge, thus producing a positive dipole in which the lower region of the thundercloud is filled with negatively charged raindrops and the upper with positively charged suspended droplets.

17. The passage is primarily concerned with discussing which of the following?
(A) A central issue in the explanation of how lightning occurs
(B) Benjamin Franklin's activities as a scientist
(C) Research into the strength and distribution of thunderstorms
(D) The direction of movement of electrical charges in thunderclouds
(E) The relation between a cloud's charge distribution and its voltage

---

18. The passage suggests that lightning bolts typically
(A) produce a distribution of charges called a positive dipole in the clouds where they originate
(B) result in the movement of negative charges to the centers of the clouds where they originate
(C) result in the suspension of large, positively charged raindrops at the tops of the clouds where they originate
(D) originate in clouds that have large numbers of negatively charged droplets in their upper regions
(E) originate in clouds in which the positive and negative charges are not uniformly distributed

19. According to the passage, Benjamin Franklin contributed to the scientific study of lightning by

(A) testing a theory proposed earlier, showing it to be false, and developing an alternative, far more successful theory of his own

(B) making an important discovery that is still important for scientific investigations of lightning

(D) developing a technique that has enabled scientists to measure more precisely the phenomena that affect the strength and location of lightning bolts

(E) predicting correctly that two factors previously thought unrelated to lightning would eventually be shown to contribute jointly to the strength and location of lightning bolts

---

20. Which of the following, if true, would most seriously undermine the precipitation hypothesis, as it is set forth in the passage?

(A) Larger clouds are more likely than smaller clouds to be characterized by complete separation of positive and negative charges.

(B) In smaller clouds lightning more often occurs within the cloud than between the cloud and the earth.

(C) Large raindrops move more rapidly in small clouds than they do in large clouds.

(D) Clouds that are smaller than average in size rarely, if ever, produce lightning bolts.

(E) In clouds of all sizes negative charges concentrate in the center of the clouds when the clouds become electrically charged

---

Before Laura Gilpin (1891-1979), few women in the history of photography had so devoted themselves to chronicling the landscape. Other women had photo- line graphed the land, but none can be regarded as a landscape photographer with a sustained body of work documenting the physical terrain. Anne Brigman often photographed woodlands and coastal areas, but They were generally settings for her artfully placed subjects. Dorothea Lange's landscapes were always conceived of as counterparts to her portraits of rural women.

At the same time that Gilpin's interest in landscape work distinguished her from most other women pho- tographers, her approach to landscape photography set her apart from men photographers who, like Gilpin, documented the western United States. Western American landscape photography grew out of a male tradition, pioneered by photographers attached to government and commercial survey teams that went west in the 1860's and 1870's. These explorer- photographers documented the West that their employers wanted to see: an exotic and majestic land shaped by awesome natural forces, unpopulated and ready for American settlement. The next generation of male photographers, represented by Ansel Adams and Eliot Porter, often worked with conservationist groups rather than government agencies or commercial companies, but they nonetheless preserved the "heroic" style and maintained the role of respectful outsider peering in with reverence at a fragile natural world.

For Gilpin, by contrast, the landscape was neither an empty vista awaiting human settlement nor a jewel-like scene resisting human intrusion, but a peopled landscape with a rich history and tradition of its own, an environment that shaped and molded the lives of its inhabitants. Her photographs of the Rio Grande, for example, consistently depict the river in terms of its significance to human culture: as a source of irrigation water, a source of food for livestock, and a provider of town sites. Also instructive is Gilpin's general avoidance of extreme close-ups of her natural subjects: for her, emblematic details could never suggest the intricacies of the interrelationship between people and nature that made the landscape a compel- ling subject. While it is dangerous to draw conclusions about a"feminine" way of seeing from the work of one woman, it can nonetheless be argued that Gilpin's unique approach to landscape photography was analogous to the work of many women writers who, far more than their male counterparts, described the land- scape in terms of its potential to sustain human life.

Gilpin never spoke of herself as a photographer with a feminine perspective: she eschewed any discussion of gender as it related to her work and maintained little interest in interpretations that relied on the concept of a "woman's eye." Thus it is ironic that her photographic evocation of a historical landscape should so clearly present a distinctively feminine approach to landscape photography.

21. Which of the following best expresses the main idea of the passage?
(A) Gilpin's landscape photographs more accurately documented the Southwest than did the photographs of explorers and conservationists.
(B) Gilpin's style of landscape photography substantially influenced the heroic style practiced by her male counterparts.
(C) The labeling of Gilpin's style of landscape photography as feminine ignores important ties between it and the heroic style.
(D) Gilpin's work exemplifies an arguably feminine style of landscape photography that contrasts with the style used by her male predecessors.
(E) Gilpin's style was strongly influenced by the work of women writers who described the landscape in terms of its relationship to people.

---

22. It can be inferred from the passage that the teams mentioned in line 19 were most interested in which of the following aspects of the land in the western United States?
(A) Its fragility in the face of increased human intrusion
(B) Its role in shaping the lives of indigenous peoples
(C) Its potential for sustaining future settlements
(D) Its importance as an environment for RARE PLANTS AND ANIMALS
(E) Its unusual vulnerability to extreme natural forces

---

23. The author of the passage claims that which of the following is the primary reason why Gilpin generally avoided extreme close-ups of natural subjects?

(A) Gilpin believed that pictures of natural details could not depict the interrelationship between the land and humans.
(B) Gilpin considered close-up photography to be too closely associated with her predecessors.
(C) Gilpin believed that all of her photographs should include people in them.
(D) Gilpin associated close-up techniques with photography used for commercial purposes.
(E) Gilpin feared that pictures of small details would suggest an indifference to the fragility of the land as a whole.

---

24. The passage suggests that a photographer who practiced the heroic style would be most likely to emphasize which of the following in a photographic series focusing on the Rio Grande?
(A) Indigenous people and their ancient customs relating to the river
(B) The exploits of navigators and explorers
(C) Unpopulated, pristine parts of the river and its surroundings
(D) Existing commercial ventures that relied heavily on the river
(E) The dams and other monumental engineering structures built on the river

---

25. It can be inferred from the passage that the first two generations of landscape photographers in the western United States had which of the following in common?
(A) They photographed the land as an entity that had little interaction with human culture.
(B) They advanced the philosophy that photographers should resist alliances with political or commercial groups.
(C) They were convinced that the pristine condition of the land needed to be preserved by government action.
(D) They photographed the land as a place ready for increased settlement.
(E) They photographed only those locations where humans had settled.

---

26. Based on the description of her works in the passage, which of the following would most likely be a subject for a photograph taken by Gilpin?
(A) A vista of a canyon still untouched by human culture
(B) A portrait of a visitor to the West against a desert backdrop
(C) A view of historic Native American dwellings carved into the side of a natural cliff
(D) A picture of artifacts from the West being transported to the eastern United States for retail sale
(E) An abstract pattern created by the shadows of clouds on the desert

---

27. The author of the passage mentions women writers in line 50 most likely in order to

(A) counter a widely held criticism of her argument
(B) bolster her argument that Gilpin's style can be characterized as a feminine style
(C) suggest that Gilpin took some of her ideas for photographs from landscape descriptions by women writers
(D) clarify the interrelationship between human culture and the land that Gilpin was attempting to capture
(E) offer an analogy between photographic close-ups and literary descriptions of small details

---

28. FICTITIOUS:
(A) classical
(B) natural
(C) factual
(D) rational
(E) commonplace

---

29. BRIDLED:
(A) without recourse
(B) without restraint
(C) without meaning
(D) without curiosity
(E) without subtlety

---

30. CAPTIVATE:
(A) repulse
(B) malign
(C) proscribe
(D) send out

---

31. DISSIPATE:
(A) accumulate
(B) emerge
(C) overwhelm
(D) adhere
(E) invigorate

---

32. OSTRACIZE:
(A) clarify
(B) subdue
(C) welcome
(D) renew
(E) crave

---

33. LOATH:
(A) clever
(B) reasonable
(C) fortunate
(D) eager
(E) confident

---

34. VITIATE:
(A) ingratiate
(B) convince
(C) regulate
(D) fortify
(E) constrict

---

35. LAVISH:
(A) insist
(B) criticize
(C) undermine
(D) stint
(E) waste

---

36. VITUPERATIVE:
(A) complimentary
(B) demagogic
(C) hopeful
(D) admirable
(E) veracious

---

37. MORIBUND:
(A) discontinuous
(B) natural
(C) nascent
(D) rational
(E) dominant

---

38. CATHOLIC:
(A) narrow
(B) soft
(C) trivial
(D) calm
(E) quick

SECTION 6
Time: 30 Minutes
25 Questions

Information for questions 1-7

A scientist will perform six experiments - P, R, T, X, Y, and z - during a three-month period, August through October. In each of the three months, exactly two of the experiments will be performed. Each experiment will start on the first day of a month and be completed during that month, The order in which the experiments are performed will also be governed by the following restrictions:
R must be performed in August or in September.
T must be performed in September or in October.
T cannot be performed in the same month in which X is performed.
X must be performed in an earlier month than the month in which Z is performed.

---

1. Which of the following can be the schedule for the six experiments?
(A) Aug: P, R — Sep: T, X — Oct: Y, Z
(B) Aug: R, T — Sep: X, Y — Oct: P, Z
(C) Aug: R, X — Sep: T, Y — Oct: P, Z
(D) Aug: X, Y — Sep: P, Z — Oct: R, T
(E) Aug: Y, Z — Sep: R, T — Oct: P, X

---

2. Any of the following experiments can be performed in August EXCEPT
(A) P

(B) R
(C) X
(D) Y
(E) Z

---

3. If T is performed in September, which of the following must be true?
(A) P is performed in August.
(B) R is performed in September.
(C) X is performed in August.
(D) Y is performed in September.
(E) Z is performed in October.

---

4. If R is performed in the same month as Z, which of the following can be the pair of experiments performed in October?
(A) P and X
(B) P and Y
(C) R and Z
(D) T and Y
(E) X and Y

---

5. If T is performed in the month before Z is performed, which of the following is a pair of experiments that can be performed in the same month as each other?
(A) P and R
(B) P and Y
(C) R and Y
(D) R and Z
(E) X and Y

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6. If P is performed in the same month as Y, which of the following must be true?
(A) R is performed in the same month as T.
(B) R is performed in the same month as X.
(C) T is performed in August.
(D) X is performed in August.
(E) Y is performed in October.

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7. If X is performed in the month before Y is performed, which of the following must be true?
(A) P is performed in August.
(B) R is performed in September.
(C) T is performed in September.
(D) X is performed in August.
(E) Z is performed in October.

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8. Roger: Reading a lot as a child causes nearsightedness-difficulty seeing things at a distance.
Louise: I disagree. Any correlation between nearsightedness and reading results from the fact that children who have trouble seeing things at a distance are likeliest to prefer those activities, such as reading, that involve looking at things close up.
Louise disputes Roger's claim by
(A) demonstrating that an absurd conclusion would follow if Roger's claim were accepted
(B) arguing that what Roger claims to be a cause of a given phenomenon is actually its effect
(C) using an analogy to expose a flaw in Roger's reasoning
(D) pointing out that Roger's claim is self-contradictory
(E) attempting to demonstrate that Roger uses the term" nearsightedness" in an ambiguous way

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9. Years ago, consumers in Frieland began paying an energy tax in the form of two Frieland pennies for each unit of energy consumed that came from nonrenewable sources. Following the introduction of this energy tax, there was a steady reduction in the total yearly consumption of energy from nonrenewable sources.
If the statements in the passage are true, then which of the following must on the basis of them be true?
(A) There was a steady decline in the yearly revenues generated by the energy tax in Frieland.
(B) There was a steady decline in the total amount of energy consumed each year in Frieland.
(C) There was a steady increase in the use of renewable energy sources in Frieland
(D) The revenues generated by the energy tax were used to promote the use of energy from renewable sources.
(E) The use of renewable energy sources in Frieland greatly increased relative to the use of nonrenewable energy sources.

Information for questions 10-14

A seating arrangement is being planned for a group of eight people - three women: J, K, and L; two men: N and O ;and three children: R, S, and T, Each of the eight will sit at exactly one of three tables according to the following conditions:

No table can have more than three people sitting at it .
Each table must have one of the children sitting at it .
O and S must sit at the same table as each other. K and L cannot sit at the same table as each other.
N and R cannot sit at the same table as each other.

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10. If O sits at the same table as K, which of the following must sit at the same table as each other?
(A) J and T
(B) L and R
(C) N and K
(D) N and T
(E) O and N

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12. If N sits at the same table as S, which of the following can be true?
(A) J sits at a table with only one other person.
(B) L sits at a table with only one other person.
(C) K sits at the same table as O.
(D) J sits at the same table as N.
(E) L sits at the same table as S.

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13. Each of the following is a pair of people who can sit at the same table as each other EXCEPT
(A) J and O
(B) K and S
(C) L and R
(D) N and S
(E) O and T

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14. If O and S are the only people sitting at one of the tables, which of the following can be the group of people sitting at one of the other two tables?
(A) J, K, and N
(B) K, L, and T
(C) K, N, and T
(D) K, R, and T
(E) L, N, and R

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15. Despite a dramatic increase in the number of people riding bicycles for recreation in Parkville, a recent report by the Parkville Department of Transportation shows that the number of accidents involving bicycles has decreased for the third consecutive year.
Which of the following, if true during the last three years, best reconciles the apparent discrepancy in the facts above?
(A) The Parkville Department of Recreation confiscated abandoned bicycles and sold them at auction to any interested Parkville residents.
(B) Increased automobile and bus traffic in Parkville has been the leading cause of the most recent increase in automobile accidents.
(C) Because of the local increase in the number of people bicycling for recreation, many out-of-town bicyclists ride in the Parkville area.
(D) The Parkville Police Department enforced traffic rules for bicycle riders much more vigorously and began requiring recreational riders to pass a bicycle safety course.
(E) The Parkville Department of Transportation canceled a program that required all bicycles to be inspected and registered each year.

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16. Do strong electric currents, by means of the electromagnetic fields that accompany them, cause cancer in people who live and work nearby? Telephone line workers, who work near such currents every day, can provide a test case. They show elevated levels of brain cancer, therefore, the hypothesis of electromagnetic causation is supported. Which of the following if true, most seriously weakens the argument?
(A) Burying power lines and other measures to protect the public from such electromagnetic fields would be prohibitively expensive.
(B) Telephone line workers are exposed to levels of chemical solvents high enough to cause brain cancer.
(C) High exposure to strong electromagnetic fields is correlated with a slightly higher-than-normal incidence of childhood leukemia, which is a form of cancer.
(D) Public health officials who found that a group of different illnesses in people living near a power substation could not reliably be attributed to its electromagnetic field were accused of covering up the facts.
(E) Telephone line workers, like most people, have electrical appliances at home, and most electrical appliances, when turned on, are surrounded by and electromagnetic field of some measurable level.

Information for questions 17-20

A library is equipped with a system of pneumatic tubes for sending documents from one to another of exactly six departments-G, H, L, M, S, and T. A tube line is a pair of tubes that connects one department with exactly one other department, with documents moving in one direction in one tube and in the opposite direction in the other tube. The library's system

consists of the following seven tube lines and no others.

Line 1 connects H and L.
Line 2 connects H and S.
Line 3 connects L and T.
Line 4 connects S and T.
Line 5 connects M and T.
Line 6 connects L and M.
Line 7 connects G and H.

Use of the system is subject to the following restrictions:
Documents to be sent between departments that are not connected by a tube line can be transferred from one line to another at departments served by two or more lines, until the document reaches its destination.
A document cannot use any tube line more than once on its way to its destination, nor can the document return to its department of origin on its way to its destination.

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17. Any of the following is an acceptable pathway for a document to be sent from S to M, listing all lines used in order from the line first used to the line last used, EXCEPT
(A) line 4, line 5
(B) line 2, line 3, line 5
(C) line 2, line 1, line 6
(D) line 4, line 1, line 6
(E) line 2, line 1, line 3, line 5

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18. Which of the following is a complete and accurate list of the lines any one of which could be the second line used by a document sent from T to G?
(A) Lines 1, 2, and 3
(B) Lines 1, 2, and 4
(C) Lines 1, 2, and 6
(D) Lines 2, 3, and 4
(E) Lines 2, 3, and 6

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19. If line 3 cannot be used, a document to be sent from T to H that uses as few tube lines as possible must use line
(A) 1
(B) 2
(C) 5
(D) 6
(E) 7

20. A pathway from M to H that includes as many tube lines as possible must include lines
(A) 1 and 2
(B) 1 and 3
(C) 3 and 4
(D) 4 and 5
(E) 5 and 6

Information for questions 21-23

Eight figure skaters -four women: Fiona, Gloria, Heidi, and Jill; and four men: Ravi, Shigeru, Toby, and Vernon-will participate in a one-day skating exhibition consisting of four consecutively performed sets - set 1 through set 4. Each set will be performed in exactly one pair of skaters, one man and one woman. Each skater will performed by exactly one of the sets, subject to the following constraints:

Ravi skates in an earlier set than Vernon does.
Fiona skates in either set 1 or set 4.
Jill does not skate with Toby.
Shigeru skates with either Fiona or Gloria.

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21. Which of the following could be the pairs of skaters who skate in each set, from set 1 through set 4?
(A) Set 1: Fiona, Ravi — Set 2: Jill, Toby — Set 3: Gloria, Shigeru — Set 4: Heidi, Vernon
(B) Set 1: Gloria, Shigeru — Set 2: Heidi, Ravi — Set 3: Fiona, Toby — Set 4: Jill, Vernon
(C) Set 1: Heidi, Shigeru — Set 2: Gloria, Ravi — Set 3: Jill, Vernon — Set 4: Fiona, Toby
(D) Set 1: Heidi, Toby — Set 2: Gloria, Shigeru — Set 3: Jill, Ravi — Set 4: Fiona, Vernon
(E) Set 1: Jill, Vernon — Set 2: Heidi, Ravi — Set 3: Gloria, Shigeru — Set 4: Fiona, Toby

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22. If Gloria skates with Toby in set 1, which of the following must be true?
(A) Vernon skates in set 2.
(B) Shigeru skates in set 4.
(C) Ravi skates in set 3.
(D) Jill skates in set 4.
(E) Heidi skates in set 3.

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23. If Heidi skates in set 1 and Toby skates in set 2, which of the following must be true?

(A) Fiona skates with Ravi.
(B) Gloria skates with Ravi.
(C) Gloria skates with Shigeru.
(D) Gloria skates with Vernon.
(E) Jill skates with Vernon.

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24. Neither the Sami nor the Kephrian delegations attended the international conference. Beforehand, the delegations of Daqua and Kephria, allies whose governments had grievances against Tessia, officially announced that one or both of the two would stay away if the Tessian delegation attended the conference. In response, the Sami delegation officially announced that it would definitely attend if both the Daquan and Kephrian delegations stayed away.
If the statements given are all true and all the delegations adhered to their official announcements, it must also be true that the
(A) Daquan delegation attended the conference
(B) Daquan delegation did not attend the conference
(C) Sami government had no grievance against Tessia
(D) Tessian delegation did not attend the conference
(E) Tessian delegation made no official announcement regarding its attendance at the conference

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25. On turning 65 years old, everyone living in the town of Malton becomes eligible to receive a card that guarantees discounts. Census records for 1990 show that 2,450 inhabitants of Malton turned 64 in that year. Yet, in 1991 over 3,000 people applied for and properly received discount cards. So clearly some of Malton's population growth between 1990 and 1992 must be attributable to migration into the city by people in their mid-60's.

Which of the following is an assumption on which the argument depends?

(A) The town of Malton has no complete census records for 1991.
(B) The overall size of the population of Malton grew by over 500 during 1990.
(C) Fewer people applied for and received discount cards in 1991 than did so in 1992.
(D) Among the people 65 years old or older who moved into Malton in 1991, there was no one who did not apply for a discount card.
(E) In general, people who applied for and received discount cards in 1991 first became eligible to do so in that year.
