

6. DEVASTATE (1)

- A. injure B. frighten
C. ✓ **shock** D. renovate

Answer: C

To devastate someone means to overwhelm them with severe grief or distress, making 'shock' a suitable synonym in this context.

7. PRICELESS (1)

- A. valueless B. useful
C. worthless D. ✓ **invaluable**

Answer: D

Priceless means having a value beyond any price, which is exactly what 'invaluable' means, whereas 'worthless' and 'valueless' are its antonyms.

8. LAUGHTER: DELIGHT; _____: discontent (1)

- A. satisfaction B. sorrow
C. excitement D. ✓ **complaint**

Answer: D

Laughter is an outward vocal/physical expression of delight, while a complaint is an expression of discontent.

9. DESCRIBE: PLACE; _____: idea (1)

- A. tell B. think
C. give D. ✓ **explain**

Answer: D

One describes a place to represent its characteristics, and one explains an idea to make its meaning clear.

10. APPLE: FRUIT; _____: cereal (1)

- A. crop B. ✓ **wheat**
C. orange D. juice

Answer: B

An apple is a specific member of the fruit category, and wheat is a specific member of the cereal category.

11. Common: _____; SLIGHT: SEVERE (1)

- A. ✓ **extraordinary** B. usual
C. expected D. dull

Answer: A

Slight and severe are antonyms, so we need the antonym of common, which is extraordinary.

12. KITCHEN: HOUSE; _____: school (1)

- A. teacher B. desk
C. ✓ **classroom** D. director

Answer: C

A kitchen is a designated room within a house, just as a classroom is a designated room within a school.

13. People flock to the capital city in large numbers in search of opportunities. This has created problems in the city as limited resources have to be shared with the new arrivals. It's becoming harder to find jobs in the city, and house rent has skyrocketed. (1)
- A. The city administration should regulate entrance into the capital city.
 - B. ✓ **More opportunities should be created in the migrants' original areas.**
 - C. The city administration should create more jobs and construct more condominiums.
 - D. The city administration should look for international aid to create jobs for the new arrivals.

Answer: B

The text states that people migrate to the capital in search of opportunities, so creating opportunities in their original areas addresses the root cause of the migration.

14. Most people think that education is crucial for success in an individual's life. There are a number of people who have applied their education to improve their lives. However, there are also those who have very little education who have become multi-billionaires. We can, therefore, safely conclude that: (1)
- A. formal education is a waste of time.
 - B. uneducated people who have become successful are always corrupt.
 - C. ✓ **formal education helps people to improve their talents.**
 - D. Becoming successful in life is just a matter of chance.

Answer: C

Since some people successfully use education to improve their lives while others succeed without it, education is beneficial but not mandatory, making C the most reasonable conclusion among the choices.

15. Five athletes: G/Egziabher, Haile, Kenenisa, Solomon, and Sileshi took part in a ten-thousand-meter competition. Sileshi finished the competition before Kenenisa and Solomon but after G/Egziabher. Haile finished before Kenenisa but after Solomon. Who finished third? (1)
- A. Kenenisa
 - B. Sileshi
 - C. G/Egziabher
 - D. ✓ **Solomon**

Answer: D

By ordering the runners based on the given clues, we get: G/Egziabher (1st) > Sileshi (2nd) > Solomon (3rd) > Haile (4) > Kenenisa (5th). Therefore, Solomon finished in third place.

16. Barack Obama was a popular American President. He became president at the age of 46. He is black American. Biden has not been as popular as Obama in his presidency. He is a white, 88-year-old American. Nelson Mandela was also a popular South African president at the age of 88. Which one of the following statements is acceptable? (1)
- A. Black people can make better presidents.
 - B. American people are free from racism.
 - C. ✓ **Age and leadership quality are not necessarily interrelated.**
 - D. Leading America is more demanding than leading South Africa.

Answer: C

Since Nelson Mandela (age 88) and Barack Obama (age 46) were highly popular presidents, while Joe Biden (age 88) has been less popular, it is clear that age is not a determining factor in leadership quality and popularity.

- 17.** Of the three models of cars (A, B, and C), Model A costs slightly lower than Model B. Model C is slightly less expensive than Model A but its fuel consumption is slightly higher than both Model A and Model B. Model B consumes less fuel per kilometer than Model A but it is not as efficient as Model C. (1)
- A. Model B is the least expensive. B. Model C is the most expensive.
C. Model A consumes the least fuel. D. ✓ **Model B is the most expensive.**

Answer: D

Since Model A costs less than Model B, and Model C costs less than Model A, the cost ordering from least to most expensive is $C < A < B$. This makes Model B the most expensive.

18. Sara hates people who tell lies the most. (1)
- A. Sara hates people who tell lies most of the time.
- B. ✓ **What Sara hates more than anything is liars.**
- C. Sara has no problem with people except liars.
- D. Sara always tells the truth.

Answer: B

The phrase 'hates... the most' means that the target of her hatred is at the very top of her list of disliked things, which is equivalent to saying she hates liars more than anything else.

19. Most French people are friendly and fair. Nicola is French. I also know some French people who are biased. Therefore,
- A. ✓ may be friendly B. is both friendly and fair
- C. cannot be biased D. must be fair

Answer: A

Since only 'most' (not all) French people are friendly, we cannot say with absolute certainty that Nicola 'is' or 'must be' friendly, but we can logically conclude that she 'may' be friendly.

- 20.** The concept of democracy is so _____ that it conveys variable meanings to different people. (1)
- A. concrete B. ✓ **abstract**
- C. divisive D. advanced

Answer: B

An 'abstract' concept is one that is theoretical, not concrete, which makes it prone to conveying variable meanings to different people depending on their interpretation.

- 21.** As more people settle on areas previously inhabited by wild animals, most of such animals become _____. (1)
- A. frightened B. evacuated
- C. domesticated D. ✓ endangered

Answer: D

As humans encroach on and settle in wildlife habitats, the lack of space and resources causes these wild animals to become 'endangered'.

- 22.** Undue competition among people for natural resources will lead to _____ of land. (1)
- A. innovation B. overpopulation
- C. ✓ **degradation** D. democratization

Answer: C

Undue and unregulated competition for limited natural resources like soil, forests, and water inevitably leads to environmental 'degradation' of the land.

23. If you want your country to register economic development, it is _____ that you deal with corruption first. (1)

- A. ✓ imperative B. arguable
C. possible D. regrettable

Answer: A

'Imperative' means of vital importance or crucial. Dealing with corruption is a crucial prerequisite for registering sustainable economic development.

24. Everyone respects the manager for his _____. (1)

- A. ✓ integrity B. strength
C. charisma D. elegance

Answer: A

'Integrity' refers to the quality of being honest and having strong moral principles, which is the most universally respected attribute for a leader or manager in a professional environment.

25. How many sheep are there if all the hens and sheep in the 500 legs and 200 heads? (1)

- A. ✓ 50 B. 100
C. 150 D. 80

Answer: A

Let H be the number of hens and S be the number of sheep. We set up the system of equations $H + S = 200$ (heads) and $2H + 4S = 500$ (legs), which simplifies to $2S = 100$, giving $S = 50$ sheep.

26. Which one of the following points is the intersection of the graphs of the lines $x - y + 1 = 0$ and $-x - y + 2 = 0$? (1)

- A. $(-\frac{1}{2}, -\frac{3}{2})$ B. ✓ $(\frac{1}{2}, \frac{3}{2})$
C. $(\frac{3}{2}, \frac{1}{2})$ D. $(-\frac{3}{2}, -\frac{1}{2})$

Answer: B

Adding the two equations $(x - y + 1) + (-x - y + 2) = 0$ gives $-2y + 3 = 0$, so $y = 3/2$. Substituting this into the first equation yields $x - 3/2 + 1 = 0$, so $x = 1/2$. Thus, the intersection is $(1/2, 3/2)$.

27. A school football team includes only grade 10, grade 11, and grade 12 students, in a ratio 1:2:3. How many grade 12 students are in the team if the team has 30 members? (1)

- A. 20 B. ✓ 15
C. 10 D. 5

Answer: B

The ratios of grade 10, 11, and 12 students are 1:2:3, making the fraction of grade 12 students equal to $\frac{3}{1+2+3} = \frac{1}{2}$. For a 30-member team, this gives $30 \times \frac{1}{2} = 15$ students.

28. Which of the following ordered pairs is included in the solution set of the system of linear inequalities given by $-2x + y \geq 0$ and $3x + 2y \leq 6$? (1)

- A. (3, 1) B. (1, -2)
C. (1, 4) D. ✓ (-1, 1)

Answer: D

Testing the point $(-1, 1)$ in the system, we find that $-2(-1) + 1 = 3 \geq 0$ and $3(-1) + 2(1) = -1 \leq 6$. Since both inequalities are satisfied, $(-1, 1)$ is in the solution set.

- 29.** What is the coefficient of x^3 in the expansion of the product of $(x^3 - 20x^2 + 4x + 2)(15x^3 + x^2 - 2x - 1)$? (1)
- A. ✓ 73 B. 93
C. 83 D. 103

Answer: A

The coefficient of x^3 in the product is obtained by summing the products of the coefficients of the terms whose degrees add up to 3: $(1)(-1) + (-20)(-2) + (4)(1) + (2)(15) = -1 + 40 + 4 + 30 = 73$.

- 30.** When the polynomial function $f(x) = x^4 - 6x^3 + 15x^2 - 18x + d$ is divided by $g(x) = x^2 - 2x + 3$, the quotient is $x^2 - bx + 4$ and the remainder is $cx - 2$, where b, c and d are constants. Then what is the value of c ?
- A. 10
B. -4
C. 4
D. ☒ 2

Answer: D

Expanding the right side $(x^2 - 2x + 3)(x^2 - bx + 4) + cx - 2$ and comparing the coefficients of x^3 gives $-2 - b = -6 \implies b = 4$. Then, comparing the coefficients of x gives $-8 - 3b + c = -18 \implies -8 - 12 + c = -18$, which yields $c = 2$.

- 31.** A television was on sale for 20% decrease from its original price. What was the original price of the television if the sale price was Birr 40,000 tax-free? (1)
- A. Birr 54,000 B. Birr 44,000
- C. ✓ **Birr 50,000** D. Birr 33,000

Answer: C

If the original price is P , a 20% decrease means the sale price is $0.80P$. Setting $0.80P = 40,000$ gives $P = 50,000$ Birr.

- 32.** A man throws a rock in a vertical upward trajectory with velocity of 7 m/s on 90 meters tall roof of his house. Its height can be modeled using the quadratic function $h(t) = -5t^2 + 7t + 90$. At what approximate time does the rock hit the ground?
- A. 3 second B. 4.7 second
C. 6.7 second D. ✓ 5 second

Answer: D

Setting $h(t) = -5t^2 + 7t + 90 = 0$ gives $5t^2 - 7t - 90 = 0$. Factoring or using the quadratic formula, we find the positive solution $t = \frac{7 + \sqrt{49 + 1800}}{10} = \frac{7 + 43}{10} = 5$ seconds.

- 33.** Let $f\left(\frac{2}{3}x - \frac{4}{3}\right) = 5x^3 + 16x^2 + 2x + 1$, and x be a real number. Consider the two quantities A and B given below.
- | Quantity A | Quantity B |
|------------|------------|
| $f(2)$ | 600 |
- A.** ✓ **Quantity A is greater than Quantity B.**
- B.** Quantity A is less than Quantity B.
- C.** The two quantities are equal.
- D.** A relationship cannot be determined.

Answer: A

To find $f(2)$, we set $\frac{2}{5}x - \frac{4}{3} = 2 \implies x = 5$. Evaluating the polynomial at $x = 5$ gives $f(2) = 5(5)^3 + 16(5)^2 + 2(5) + 1 = 625 + 400 + 11 = 1036$. Since $1036 > 600$, Quantity A is greater than Quantity B.

34. The following table shows the profit of two shops in the month of January and February in 2015 Ethiopian calendar. Shop January February Shop 1 Birr 20,000 Birr 30,000 Shop 2 Birr 10,000 Birr 15,000 Quantity A: Percentage increase in shop 1 Quantity B: Percentage increase in shop 2 (1)

- A. Quantity A is greater than Quantity B. B. Quantity A is less than Quantity B.
C. ✓ The two quantities are equal. D. The two quantities cannot be compared.

Answer: C

The percentage increase for Shop 1 is $\frac{30,000-20,000}{20,000} \times 100\% = 50\%$, and for Shop 2 it is $\frac{15,000-10,000}{10,000} \times 100\% = 50\%$. Since both increases are equal to 50%, the two quantities are equal.

35. What is the probability that the sum is neither 5 nor 10 if two dice are thrown? (1)

- A. $\frac{2}{9}$ B. $\frac{7}{36}$
C. $\frac{7}{9}$ D. ✓ $\frac{29}{36}$

Answer: D

The number of outcomes where the sum of two dice is 5 is 4, and the number of outcomes where the sum is 10 is 3. Since there are 36 total outcomes, the probability of the sum being neither 5 nor 10 is $1 - \frac{4+3}{36} = \frac{29}{36}$.

36. On a total of 9 chairs, 4 boys and 5 girls have to be seated. If the boys and girls sit alternately, how many different ways may they be seated? (1)

- A. 5 B. ✓ 2,880
C. 126 D. 362,880

Answer: B

Because there are 5 girls and 4 boys, to sit alternately, they must follow the pattern G B G B G B G B G. The number of ways to arrange them in this unique pattern is $5! \times 4! = 120 \times 24 = 2,880$.

37. Which one of the following can be the first four terms of a geometric sequence whose fourth term is 125 and whose tenth term is $\frac{125}{64}$? (1)

- A. ✓ 1000, 500, 250, 125, ... B. 1000, 500, -250, 125, ...
C. 3375, 1125, 375, 125, ... D. -500, 375, -250, 125, ...

Answer: A

For a geometric sequence, $a_{10} = a_4 \cdot r^6$. Substituting the given values, we find $\frac{125}{64} = 125 \cdot r^6$, which simplifies to $r^6 = \frac{1}{64}$, so $r = \pm \frac{1}{2}$. If $r = \frac{1}{2}$, working backward from $a_4 = 125$ gives $a_3 = 250$, $a_2 = 500$, and $a_1 = 1000$, matching option A.

38. Which term of the arithmetic sequence {24, 30, 36, 42, 48, 54, 60, ...} is 204? (1)

- A. 30th B. ✓ 31st
C. 32nd D. 33rd

Answer: B

The arithmetic sequence has $a_1 = 24$ and common difference $d = 30 - 24 = 6$. Using the formula $a_n = a_1 + (n - 1)d$, we set $204 = 24 + 6(n - 1)$, which simplifies to $180 = 6(n - 1)$ or $n - 1 = 30$, yielding $n = 31$ (the 31st term).

39. Which one of the following is the solution set of the system of linear equations given by $3x - 4y = 2$ and $-6x + 8y = -10$? (1)
- A. $\{(2, 1)\}$ B. $\{(3, 1)\}$
C. $\checkmark \ \{\}$ D. $\{(0, -2)\}$

Answer: C

Multiplying the first equation $3x - 4y = 2$ by -2 yields $-6x + 8y = -4$. This contradicts the second equation $-6x + 8y = -10$. Since the two lines are parallel and do not intersect, there is no solution, so the solution set is empty $\{\}$.

40. Which of the following is the sum of the first 16 terms of the arithmetic sequence $\{-2, \frac{3}{2}, 5, \frac{17}{2}, \dots\}$? (1)
- A. 420 B. 380
C. 402 D. $\checkmark$ 388

Answer: D

The arithmetic sequence has $a_1 = -2$ and $d = \frac{3}{2} - (-2) = \frac{7}{2}$. The sum of the first 16 terms is given by $S_{16} = \frac{16}{2}[2(-2) + 15(\frac{7}{2})] = 8[-4 + 52.5] = 8[48.5] = 388$.

41. What is the value of α if $\sum_{n=1}^{\infty} 3^{-\alpha n} = \frac{1}{2}$? (1)
- A. $\checkmark$ 1 B. -1
C. 2 D. -2

Answer: A

The expression represents an infinite geometric series with first term $a = 3^{-\alpha}$ and common ratio $r = 3^{-\alpha}$. Applying the sum formula $\frac{a}{1-r} = \frac{1}{2}$, we get $\frac{3^{-\alpha}}{1-3^{-\alpha}} = \frac{1}{2}$, which simplifies to $2(3^{-\alpha}) = 1 - 3^{-\alpha}$, or $3(3^{-\alpha}) = 1$. Thus $3^{1-\alpha} = 3^0$, yielding $\alpha = 1$.

END OF THE MARKING KEY

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