NIMCET 2024 Question Paper

Time Allowed :2 Hours	**Maximum Marks :**480	**Total questions :**120

General Instructions

Read the following instructions very carefully and strictly follow them:

1. **Exam Mode:** Computer-Based Test
2. **Medium of Exam:** English
3. **Duration:** Total Duration - 2 Hours
    - **Part I** - 70 Minutes
    - **Part II** - 30 Minutes
    - **Part III** - 20 Minutes
4. **Type of Questions:** Objective Multiple Choice Questions (MCQs)
5. **Sections:**
    - Mathematics - 50 Questions
    - Analytical Ability & Logical Reasoning - 40 Questions
    - Computer Awareness - 20 Questions
    - General English - 10 Questions
6. **Total Number of Questions:** 120
7. **Total Marks:** 480

Mathematics

1. How much work is done to slide a crate for a distance of 25 m along a loading dock by pulling on it with a 180 N force where the dock is at an angle of 45° from the horizontal?

(1) 3.18198×10^3 J

(2) 3.18198×10^2 J

(3) 3.4341×10^3 J

(4) 3.4341×10^4 J

---

2. Let $f : \mathbb{R} \to \mathbb{R}$ be a function such that $f(0) = \frac{1}{\pi}$ and $f(x) = \frac{x}{e^x - 1}$ for $x \neq 0$. Then:

(1) $f(x)$ is not continuous at $x = 0$

(2) $f(x)$ is continuous but not differentiable at $x = 0$

(3) $f(x)$ is differentiable at $x = 0$ and $f'(0) = \frac{\pi}{2}$

(4) None of these

---

3. The value of the limit

$$\lim_{x \to 0} \left(\frac{1^x + 2^x + 3^x + 4^x}{4} \right)^{\frac{1}{x}}$$

is:

(1) 1

(2) $3^{1/3}$

(3) $3^{1/4}$

(4) $4^{1/4}$

---

5. Consider the function $f(x) = x^{2/3} \cdot (6 - x)^{1/3}$. Which of the following statements is false?

(1) f is increasing in the interval $(0, 4)$

(2) f is decreasing in the interval $(6, \infty)$

(3) f has a point of inflection at $x = 0$

(4) f has a point of inflection at $x = 6$

---

6. Lines $L_1, L_2, \ldots, L_{10}$ are distinct, among which the lines $L_2, L_4, L_6, L_8, L_{10}$ are parallel to each other, and the lines L_1, L_3, L_5, L_7, L_9 pass through a given point C. The number of points of intersection of pairs of lines from the complete set $L_1, L_2, L_3, \ldots, L_{10}$ is:

(1) 24

(2) 25

(3) 26

(4) 27

---

7. For an invertible matrix A, which of the following is not always true:

(1) $|\text{adj}(A)| \neq 0$

(2) $|A| \neq 0$

(3) $\left|AA^{-1}\right| = 1$

(4) $|A\,\text{adj}(A)| \neq 1$

---

8. At how many points do the following curves intersect:

$$\frac{y^2}{9} - \frac{x^2}{16} = 1 \quad \text{and} \quad \frac{x^2}{4} + \frac{(y-4)^2}{16} = 1$$

(1) 0

(2) 1

(3) 2

(4) 4

---

9. The value of $f(1)$ for $f\left(\frac{1-x}{1+x}\right) = x + 2$ is:

(1) 1

(2) 2

(3) 3

(4) 4

---

10. A committee of 5 is to be chosen from a group of 9 people. The probability that a certain married couple will either serve together or not at all is:

(1) $\frac{5}{9}$

(2) $\frac{1}{2}$

(3) $\frac{2}{3}$

(4) $\frac{4}{9}$

---

11. If $x = 1 + \sqrt[6]{2} + \sqrt[6]{4} + \sqrt[6]{8} + \sqrt[6]{16} + \sqrt[6]{32}$, then $\left(1 + \frac{1}{x}\right)^{24}$ is equal to:

(1) 1

(2) 4

(3) 16

(4) 24

---

12. Among the given numbers below, the smallest number which will be divided by 9, 10, 15 and 20 and leaves the remainders 4, 5, 10 and 15, respectively, is:

(1) 85

(2) 265

(3) 535

(4) 355

---

13. Let A and B be two events defined on a sample space Ω. Suppose A denotes the complement of A relative to the sample space Ω. Then the probability $P((A \cap B) \cup (A^c \cap B))$ equals:

(1) $P(A) + P(B) + P(A \cap B)$

(2) $P(A) + P(B) - P(A \cap B)$

(3) $P(A) + P(B) + 2P(A \cap B)$

(4) $P(A) + P(B) - 2P(A \cap B)$

---

14. A speaks truth in 40% and B in 50% of the cases. The probability that they contradict each other while narrating some incident is:

(1) $\frac{2}{3}$

(2) $\frac{1}{4}$

(3) $\frac{1}{2}$

(4) $\frac{1}{3}$

---

15. The points $(1, \frac{1}{2})$ and $(3, -\frac{1}{2})$ are:

(1) In between the lines $2x + 3y = 6$ and $2x + 3y = -6$

(2) On the opposite side of the line $2x + 3y = -6$

(3) On the same side of the line $2x + 3y = -6$

(4) On the same side of the line $2x + 3y = 6$

---

16. If $(4, 3)$ and $(12, 5)$ are the two foci of an ellipse passing through the origin, then the eccentricity of the ellipse is:

(1) $\frac{\sqrt{13}}{9}$

(2) $\frac{\sqrt{13}}{18}$

(3) $\frac{\sqrt{17}}{18}$

(4) $\frac{\sqrt{17}}{9}$

---

17. For what values of λ does the equation $6x^2 - xy + \lambda y^2 = 0$ represent two perpendicular lines and two lines inclined at an angle of 45°?

(1) -6 and -2

(2) 6 and 1

(3) -6 and -35

(4) -6 and 1

---

18. The value of $\lim_{x\to 0} \frac{e^x - e^{-x} - 2x}{1-\cos(x)}$ is equal to:

(1) 2

(2) 1

(3) 0

(4) -1

---

19. The number of one-one functions $f : \{1, 2, 3\} \to \{a, b, c, d, e\}$ is:

(1) 125

(2) 60

(3) 243

(4) None of the above

---

20. If one AM (Arithmetic mean) a and two GM's (Geometric means) p and q be inserted between any two positive numbers, the value of $p^3 + q^3$ is:

(1) $2a\,pq$

(2) $\frac{pq}{a}$

(3) $\frac{2pq}{a}$

(4) $p + q + a$

---

20. If one AM (Arithmetic mean) a and two GM's (Geometric means) p and q be inserted between any two positive numbers, the value of $p^3 + q^3$ is:

(1) $2a\,pq$

(2) $\frac{pq}{a}$

(3) $\frac{2pq}{a}$

(4) $p + q + a$

---

21. A coin is thrown 8 times. What is the probability of getting a head in an odd number of throws?

(1) $\frac{3}{4}$

(2) $\frac{1}{4}$

(3) $\frac{1}{2}$

(4) $\frac{1}{8}$

---

22. The value of $\tan\left(\frac{\pi}{4} + \theta\right) \times \tan\left(\frac{3\pi}{4} + \theta\right)$ is:

(1) -2

(2) 2

(3) 1

(4) -1

---

23. The value of $\Sigma_{r=1}^{n} \frac{1}{2^n nPrr!}$ is:

(1) 2^n

(2) $1 - 2^{-n}$

(3) $2^n - 1$

(4) $2^{2n} - 1$

---

24. Let C denote the set of all tuples (x, y) which satisfy $x^2 = 2^y$, where x and y are natural numbers. What is the cardinality of C?

(1) 0

(2) 1

(3) 2

(4) 3

---

25. The value of the series $\frac{2}{3!} + \frac{4}{5!} + \frac{6}{7!} + \ldots$ is:

(1) $2e^{-2}$

(2) e^{-2}

(3) c^{-1}

(4) $2e^{-1}$

---

26. If three distinct numbers are chosen randomly, three of them are divisible by both 2 and 3 from the first 100 natural numbers, then the probability that all three are divisible by both 2 and 3 is:

(1) $\frac{4}{33}$

(2) $\frac{4}{25}$

(3) $\frac{4}{1155}$

(4) $\frac{4}{35}$

---

27. If the line $a^2x + ay + 1 = 0$, for some real number a, is normal to the curve $xy = 1$, then:

(1) $a < 0$

(2) $0 < a < 1$

(3) $a > 0$

(4) $-1 < a < 1$

---

28. Let $f(x) = \begin{cases} x^2 \sin \frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$ **. Then which of the following is true:**

(1) $f(x)$ is not continuous at $x = 0$

(2) $f(x)$ is not differentiable at $x = 0$

(3) $f'(x)$ is not continuous at $x = 0$

(4) $f'(x)$ is continuous at $x = 0$

---

29. If the perpendicular bisector of the line segment joining $P(1, 4)$ **and** $Q(k, 3)$ **has y-intercept -4, then the possible values of** k **are:**

(1) -2 and 2

(2) -1 and 1

(3) -3 and 3

(4) -4 and 4

---

30. The equation $3x^2 + 10xy + 11y^2 + 14x + 12y + 5 = 0$ **represents:**

(1) a circle

(2) an ellipse

(3) a hyperbola

(4) a parabola

---

31. Out of a group of 50 students taking examinations in Mathematics, Physics, and Chemistry, 37 students passed Mathematics, 24 passed Physics, and 43 passed

Chemistry. Additionally, no more than 19 students passed both Mathematics and Physics, no more than 29 passed both Mathematics and Chemistry, and no more than 20 passed both Physics and Chemistry. What is the maximum number of students who could have passed all three examinations?

(1) 12

(2) 9

(3) 14

(4) 10

---

32. If $f(x) = \cos([\pi^2] \cdot x) + \cos([-\pi^2] \cdot x)$**, where** $[\cdot]$ **denotes the greatest integer function, then** $f\left(\frac{\pi}{2}\right) =$

(1) -1

(2) 0

(3) 1

(4) 2

---

33. If for non-zero x**,** $cf(x) + df\left(\frac{1}{x}\right) = |\log|x|| + 3$**, where** $c \neq d$**, then** $\int_1^c f(x)\,dx =$**:**

(1) $\frac{(c-d)(2e-1)}{c^2-d^2}$

(2) $\frac{(c-d)(3e-2)}{c^2-d^2}$

(3) $\frac{(c-d)(3e+2)}{c^2-d^2}$

(4) $\frac{(c-d)(2e+1)}{c^2-d^2}$

---

34. Find the cardinality of the set C **which is defined as**

$C = \{x \mid \sin(4x) = \frac{1}{2}$ **for** $x \in (-9\pi, 3\pi)\}$**:**

(1) 24

(2) 48

(3) 36

(4) 12

---

35. The number of distinct values of a for which the vectors $\lambda^2\hat{i}+\hat{j}+\hat{k}$, $\hat{i}+\lambda^2\hat{j}+\hat{k}$, and $\hat{i}+\hat{j}+\lambda^2\hat{k}$ are coplanar is:

(1) 1

(2) 2

(3) 3

(4) 6

---

36. The number of solutions of $5^{1+|\sin x|+|\sin x|^2+|\sin x|^3+\cdots}=25$ for $x\in(-\pi,\pi)$ is:

(1) 2

(2) 0

(3) 4

(4) infinite

---

37. Let Z be the set of all integers, and consider the set

$X=\{(x,y):x^2+2y^2=3,x,y\in Z\}$ and $Y=\{(x,y):x>y,x,y\in Z\}$. Then the number of elements in $X\cap Y$ is:

(1) 2

(2) 1

(3) 3

(4) 4

---

38. If $\sin x=\sin y$ and $\cos x=\cos y$, then the value of $x-y$ is:

(1) $\frac{\pi}{4}$

(2) $n\pi/2$ (2) $n\pi$

(4) $2n\pi$

---

39. Which of the following is TRUE?

(1) If f is continuous on $[a, b]$, then $\int_a^b xf(x)\,dx = x\int_a^b f(x)\,dx$

(2) $\int_0^5 e^{x^2}\,dx = \int_0^3 e^{x^2}\,dx + \int_5^3 e^{x^2}\,dx$

(3) If f is continuous on $[a, b]$, then $\frac{d}{dx}\left(\int_a^b f(t)\,dt\right) = f(x)$

(4) Both (1) and (2)

---

40. The vector $\vec{A} = (2x + 1)\hat{i} + (x^2 - 6y)\hat{j} + (xy^2 + 3z)\hat{k}$ is a

(1) sink field

(2) solenoidal field

(3) source field

(4) None of these

---

41. Given a set A with median $m_1 = 2$ and set B with median $m_2 = 4$. What can we say about the median of the combined set?

(1) at most 1

(2) at most 2

(3) at least 1

(4) at least 2

---

42. Consider the function $f(x) = \begin{cases} -x^3 + 3x^2 + 1, & \textbf{if } x \leq 2 \\ \cos(x), & \textbf{if } 2 < x \leq 4 \\ e^{-x}, & \textbf{if } x > 4 \end{cases}$ **Which of the following statements about $f(x)$ is true:**

(1) $f(x)$ has a local maximum at $x = 1$, which is also the global maximum.

(2) $f(x)$ has a local maximum at $x = 2$, which is not the global maximum.

(3) $f(x)$ has a local maximum at $x = \pi$, but it is not the global maximum.

(4) $f(x)$ has a global maximum at $x = 0$.

---

43. The two parabolas $y^2 = 4a(x + c)$ and $y^2 = 4bx$, $a > b > 0$ cannot have a common normal unless:

(1) $c > 2(a + b)$

(2) $c > 2(a - b)$

(3) $c < 2(a - b)$

(4) $c < \frac{2}{a-b}$

---

44. The system of equations:

$$x + 2y + 2z = 5, \quad x + 2y + 3z = 6, \quad x + 2y + \lambda z = \mu$$

has infinitely many solutions if:

(1) $\lambda \neq 2$

(2) $\lambda \neq 2, \mu \neq 5$

(3) $\lambda = 2, \mu = 5$

(4) $\mu \neq 5$

---

45. It is given that the mean, median, and mode of a dataset are 1, $3x$, and $9x$ respectively. The possible values of mode are:

(1) 1, 4

(2) 1, 9

(3) 3, 9

(4) 9, 8

46. If $|\vec{F}| = 40$ N (Newtons), $|D| = 3$ m, and $\theta = 60°$, then the work done by $\vec{F}$ acting from P to Q is:

(1) $60\sqrt{3}$ J

(2) 120 J

(3) $60\sqrt{2}$ J

(4) 60 J

---

47. A man starts at the origin O and walks a distance of 3 units in the north-east direction and then walks a distance of 4 units in the north-west direction to reach the point P. Then $\overline{OP}$ is equal to:

(1) $\frac{1}{\sqrt{2}}(-\hat{i} + \hat{j})$

(2) $\frac{1}{2}(\hat{i} + \hat{j})$

(3) $\frac{1}{\sqrt{2}}(\hat{i} - 7\hat{j})$

(4) $\frac{1}{\sqrt{2}}(-\hat{i} + 7\hat{j})$

---

48. There are 9 bottles labelled 1, 2, ..., 9 and 9 boxes labelled 1, 2, ..., 9. The number of ways one can put these bottles in the boxes so that each box gets one bottle and exactly 5 bottles go in their corresponding numbered boxes is:

(1) $9 \times {}^{9}C_5$

(2) $5 \times {}^{9}C_5$

(3) $25 \times {}^{9}C_5$

(4) $44 \times {}^{9}C_5$

---

49. A critical orthopedic surgery is performed on 3 patients. The probability of recovering a patient is 0.6. Then the probability that after surgery, exactly two of them will recover is

(1) 0.321

(2) 0.234

(3) 0.432

(4) 0.123

---

50. Region R is defined as the region in the first quadrant satisfying the condition $x^2 + y^2 < 4$. Given that a point $P = (r, s)$ lies in R, what is the probability that $r > s$?

(1) 1

(2) 0

(3) $\frac{1}{2}$

(4) $\frac{1}{3}$

Analytical Ability & Logical Reasoning

1. Aryan bought 100 shares of a company at Rs. 50 per share. He paid a brokerage fee of 2% on the purchase. Later, he sold all the shares at Rs. 55 per share and paid a brokerage fee of 2% on the sale. What is Aryan's net profit percentage on his investment?

(1) 6%

(2) 5.5%

(3) 6.1%

(4) 5.69%

---

2. Four friends, Aditi, Bharat, Chandan, and Deepika went to a restaurant for dinner. Each of them ordered a different dish from the menu: pizza, pasta, burger, and salad. Additionally, each friend ordered a different drink: cola, lemonade, orange juice, and water. Based on the following clues, determine the combination of friend, dish, and drink:

- Aditi didn't order pizza or cola.
- Bharat ordered salad but not lemonade.
- Chandan ordered pasta.
- Deepika didn't order burger or orange juice.
- Aditi ordered orange juice.

Who ordered the burger and what drink did they order?

(1) Aditi, orange juice

(2) Bharat, water

(3) Chandan, lemonade

(4) Deepika, cola

---

3. Odometer is to mileage as Compass is to:

(1) Needle

(2) Speed

(3) Direction

(4) Hiking

---

4. The mean of consecutive positive integers from 2 to n is:

(1) $\frac{n+2}{2}$

(2) $\frac{n(n+1)}{2}$

(3) $\frac{n+1}{2}$

(4) 2

---

5. If 30th September, 1991 was a Wednesday, then what was the day on 14th March 1992?

(1) Sunday

(2) Saturday

(3) Wednesday

(4) Monday

---

6. In the following question, three statements and three conclusions are given.

Statements:

1. All students are intelligent.
2. No intelligent person is lazy.
3. Some lazy people are poor.

Conclusions:

1. No student is lazy.
2. Some poor people are not intelligent.
3. All poor people are lazy.

Find out the most appropriate conclusion(s) from the following options.

(1) Only conclusions 1 and 2 follow

(2) Only conclusion 1 follows

(3) Only conclusion 2 follows

(4) Only conclusions 2 and 3 follow

---

7. You are on an island with two tribes. One tribe always tells the truth, and the other tribe always lies. You meet three individuals from the island: A, B and C. Each individual belongs to one of the tribes. You ask each of them the same question: "Is B a truth-teller?"

A says, "Yes, B is a truth-teller."

B says, "No, I am not a truth-teller."

C says, "B is a liar."

(1) Both B and C

(2) A only

(3) C only

(4) B only

---

8. In a certain language, HEART is written as 2018010508, and LUNGS is written as 1907142112. If BRAIN is written in that language, what will be the last number?

(1) 5

(2) 9

(3) 4

(4) 2

---

9. Eight friends A, B, C, D, E, F, G, and H are sitting on a round table facing the centre. A sits second to the left of D, who sits third to the left of E. C sits third to the right of G, who is not an immediate neighbour of E. H sits opposite to the E. B is between A and C. Who sits opposite to A?

(1) E

(2) G

(3) D

(4) F

---

10. Select the pair of words, which are related in the same way as the capitalized words are related to each other:

DATA : GRAPH

(1) Mother : Father

(2) Milk : Butter

(3) Water : Glass

(4) Plant : Leaf

---

11. After allowing 20% cash discount, a trader still earns a profit of 11.11%. How much above the cost price did the trader mark his goods?

(1) 40%

(2) 30.33%

(3) 28%

(4) 38.88%

---

12. Select the one which is different from the other three:

(1) HEM

(2) NKS

(3) JGP

(4) OLT

---

13. Ramu visits Delhi every 15 days and Samu goes to Delhi every 20 days. They met at Delhi 5 days back. After how many days, from today, they will meet at Delhi next time?

(1) 35

(2) 60

(3) 55

(4) 65

---

14. Which pairs of bits can be joined together to form two words that have opposite meanings?

ERT	UCE	DES	END	EXP	EAR	AND	SIP	RED	GOS
1	2	3	4	5	6	7	8	9	10

Pairs:

(1) (9, 2), (5, 7)

(2) (1, 3), (8, 10)

(3) (1, 5), (10, 8)

(4) (4, 2), (7, 8)

---

15. At what time between 2 pm and 3 pm, will the hour and minute hands of a clock be in opposite directions (diametrically opposite)?

(1) 2:45 pm

(2) 2:44 pm

(3) 2:43 $\frac{9}{11}$ pm

(4) 2:43 $\frac{7}{11}$ pm

---

16. In which year was Arjun born?

Arjun at present is 25 years younger to his mother.

Arjun's brother, who was born in 1964, is 35 years younger to his mother.

(1) 1964

(2) 1944

(3) 1954

(4) 1974

---

17. Rajesh will not go to the concert if Rakesh goes. Rakesh will go to the concert if his dog barks three times.

Based only on the information above, which of the following must be true?

(1) Rakesh will not go to the concert unless Rajesh goes.

(2) If Rajesh doesn't go to the concert, then Rakesh will go.

(3) If Rakesh's dog barks three times, then Rajesh will not go to the concert.

(4) If Rakesh's dog does not bark three times, then Rakesh will not go to the concert.

---

18. In a tournament, many teams participated. All teams in the tournament have 5 to 15 players. If a team has more than 10 players, then they have reversible t-shirts. Based only on the information above, which of the following must be true?

(1) Teams that have 13 players have reversible t-shirts.

(2) Teams that have 12 players do not have reversible t-shirts.

(3) Teams with 8 players do not have reversible t-shirts.

(4) Only people on teams can have reversible t-shirts.

---

19. A cat climbs a 21-meter pole. In the first minute it climbs 3 meters and in the second minute it descends one meter. In how many minutes will the cat reach the top of the pole?

(1) 21 minutes

(2) 18 minutes

(3) 19 minutes

(4) 20 minutes

---

20. Which out of the following words will appear last in the dictionary?

(1) Compliment

(2) Compline

(3) Complete

(4) Complicit

---

21. Arrange the words given below in a meaningful sequence.

(1) Software

(2) Code

(3) Data

(4) Analysis

(5) Report

(1) 3, 1, 2, 4, 5

(2) 5, 4, 3, 1, 2

(3) 2, 1, 5, 3, 4

(4) 3, 1, 2, 5, 4

---

22. From the given options, find the pair which is like the given pair $8 : 4$**.**

(1) 45:5

(2) 216:32

(3) 72:24

(4) 27:9

---

23. Which one of the following is the odd one from the given alternatives?

(1) Highest education

(2) Salary

(3) Years of experience

(4) Age

---

24. What is the value of $x^2 + y^2 = ?$

Statement I: $xy = 5$

Statement II: $x + y = 10$

(1) Choose this option if the question can be answered by using one of the statements alone, but cannot be answered using the other statement.

(2) Choose this option if the question can be answered by using both the statements together, but cannot be answered using the other statement.
(3) Choose this option if the question can be answered by using either statement alone.
(4) Choose this option if the question cannot be answered even by using both the statements together.

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25. Looking at the portrait of a man, Lucky (male) said, "This person is the only child of my paternal grandmother's daughter." Whose portrait was Lucky looking at?

(1) His cousin
(2) His uncle
(3) His brother
(4) Himself

---

26. This question contains six statements followed by four sets of combinations of three. Choose the set in which the combinations are most logically related:

A: Some buildings are not skyscrapers.
B: Some skyscrapers are not buildings.
C: All falcons are birds.
D: All birds are yellow.
E: All birds are thirsty.
F: All falcons are yellow.
(1) CDF
(2) BCA
(3) ABC
(4) DEF

---

27. In a reality show, two judges independently provided marks based on the performance of the participants. If the marks provided by the second judge are given

by $Y = 10.5 + 2X$, where X is the marks provided by the first judge. If the variance of the marks provided by the second judge is 100, then the variance of the marks provided by the first judge is:

(1) 50

(2) 25

(3) 99

(4) 49.5

---

28. If by rearranging the letters of the word NABMODINT, a name of a game is formed. What would be the first and last letter of the mirror image of the name of the game?

(1) B, T

(2) N, B

(3) T, B

(4) B, N

---

29. This question contains six statements followed by four sets of combinations of three. Choose the set in which the combinations are most logically related:

A: All falcons fly high.

B: All falcons are blind.

C: All falcons are birds.

D: All birds are yellow.

E: All birds are thirsty.

F: All falcons are yellow.

(1) CDF

(2) BCA

(3) ABC

(4) DEF

---

30. In a recent survey of 500 employees in a company, it was found that 60% of the employees prefer coffee over tea, 25% prefer tea over coffee, and the remaining 15% have no preference. If 20% of the employees who prefer coffee are also tea drinkers, how many employees prefer only tea?

(1) 75

(2) 65

(3) 50

(4) 55

---

31. Two cars, Car A and Car B, are traveling on a highway. Car A starts from point X and travels at a constant speed of 60 km/h, while Car B starts from the same point X but travels at a constant speed of 80 km/h. If both cars travel for 1.5 hours, what is the difference in distance covered by Car B compared to Car A?

(1) 35 km

(2) 30 km

(3) 20 km

(4) 25 km

---

32. A man gives his son Rs. 500. He then takes back Rs. 100 and gives him back Rs. 50. How much does the man give his son finally?

(1) 400

(2) 450

(3) 500

(4) 600

---

33. In a group of 50 students, 30 like mathematics, 25 like science, and 15 like both. How many students do not like either mathematics or science?

(1) 10

(2) 15

(3) 20

(4) 5

---

34. COMPREHENSION: What is F's profession? Seven persons A, B, C, D, E, F and G are travelling in three vehicles — Swift, Creta, Nexon.

There are at least two people in each vehicle, and only one male.

There are two engineers, two doctors, and three teachers.

Given:

(i) C is a lady doctor and she does not travel with the pair of sisters A and F.

(ii) B, a male engineer, travels with only G, a teacher in a Swift.

(iii) D is a male doctor.

(iv) Two persons of the same profession do not travel in the same vehicle.

(v) A is not an engineer and travels in a Creta.

(vi) The pair of sisters A and F travel in the same vehicle.

(1) Doctor

(2) Data inadequate

(3) Engineer

(4) Teacher

---

35. COMPREHENSION:

Seven persons A, B, C, D, E, F and G are travelling in three vehicles — Swift, Creta, Nexon.

There are at least two people in each vehicle, and only one male.

There are two engineers, two doctors, and three teachers.

In which vehicle does C travel?

(1) Swift

(2) Data inadequate

(3) Nexon

(4) Creta

---

36. COMPREHENSION: Directions: A, B, C, D, E, F, and G are travelling in three different vehicles. There are at least two passengers in each vehicle: Swift, Creta, Nexon, and only one of them is a male. There are two engineers, two doctors, and three teachers among them.

(i) C is a lady doctor and she does not travel with the pair of sisters A and F.

(ii) B, a male engineer, travels with only G, a teacher, in a Swift.

(iii) D is a male doctor.

(iv) Two persons belonging to the same profession do not travel in the same vehicle.

(v) A is not an engineer and travels in a Creta.

(vi) The pair of sisters A and F travels in the same vehicle.

Which of the following represents the three teachers?

(1) Data inadequate

(2) GBF

(3) GEA

(4) GEF

---

37. COMPREHENSION: Directions: A, B, C, D, and E are five different integers. When written in the ascending order of values, the difference between any two adjacent integers is 8. D is the greatest and A the least. B is greater than E but less than C. The sum of the integers is equal to E. The value of A is:

(1) -18

(2) -17

(3) None of these

(4) -15

---

38. COMPREHENSION: Directions: A, B, C, D, and E are five different integers. When written in the ascending order of values, the difference between any two adjacent integers is 8. D is the greatest and A the least. B is greater than E but less than C. The sum of the integers is equal to E. The sum of A and B is:

(1) -15

(2) -30

(3) -20

(4) None of these

---

39. A, B, C, D, and E are five different integers. When written in ascending order of values, the difference between any two adjacent integers is 8. D is the greatest and A the least. B is greater than E but less than C. The sum of the integers is equal to E. The greatest number has the value:

(1) 14

(2) 15

(3) 12

(4) 17

---

40. A, B, C, D and E are five different integers. When written in ascending order of values, the difference between any two adjacent integers is 8. D is the greatest and A the least. B is greater than E but less than C. The sum of the integers is equal to E. The sum of the integers is:

(1) -6

(2) -10

(3) None of these

(4) -8

Computer Awareness

1. Given that numbers A and B are two 8-bit 2's Complement numbers with $A = 11111111$, $B = 11111111$. Then sum $A + B$ is:

(1) 00000010

(2) 11111100

(3) 11111110

(4) 00000000

---

2. Consider an arbitrary number system with independent digits as 0, 1, and A. If we generate the first few numbers in the sequence as 00, 01, 0A, 10, 11, 1A and if this process is continued to generate the numbers, then the position of 10A is:

(1) 15

(2) 12

(3) 9

(4) 10

---

3. The Boolean expression for the following truth table is:

x	y	z	f
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

(1) $F = x'y'z + xy'z + x'y'z'$

(2) $F = x'y'z' + xy'z + xyz'$

(3) $F = x'y'z + xy'z + xyz$

(4) None of these

---

4. Consider the following 4-bit binary numbers represented in the 2's complement form: 1101 and 0100. What would be the result when we add them?

(1) 0001 and an overflow

(2) 1001 and no overflow

(3) 1001 and an overflow

(4) 0001 and no overflow

---

5. Which of the following interfaces perform the transfer of data between the memory and the I/O peripheral without involving the CPU?

(1) Branch Interface

(2) Serial Interface

(3) DMA

(4) DDA

---

6. Which of the following is the smallest unit of data in a computer?

(1) Byte

(2) Bit

(3) Nibble

(4) KB

---

7. Consider the program below which uses six temporary variables a, b, c, d, e and f.

```
a = 10
b = 20
c = 30
d = a + c
e = b + d
f = c + c
b = c + e
e = b + f
d = 5 + e
return d + f
```

Assuming that all the above operations take their operands from registers, the minimum number of registers needed to execute this program without spilling is:

(1) 5

(2) 6

(3) 3

(4) 4

---

8. The quotient, if the binary number 11010111 **is divided by** 101**, is**

(1) 101011

(2) 101010

(3) 101101

(4) 111001

---

9. Which of the following components is used to establish a communication link between a CPU and the peripheral devices to transfer data?

(1) Memory address register

(2) Instruction register

(3) Memory data register

(4) Index register

---

10. A computer system has 16-bit wide address/data bus that uses RAM chips of $4K \times 8$-bit capacity. The number of RAM chips needed to provide a memory capacity of 64 Kbytes memory is

(1) 32

(2) 16

(3) 64

(4) 8

---

11. The primary purpose of cache memory in a computer system is

(1) to manage input and output operations between the CPU and peripherals

(2) to temporarily store frequently accessed data and instructions for faster access by the CPU

(3) to permanently store data and programs

(4) to provide additional storage space when the main memory is full

---

12. Which of the following do not affect CPU performance?

(1) Cache size

(2) Number of cores

(3) Amount of RAM

(4) Clock speed

---

13. A CPU generates 32 bits virtual addresses. The page size is 4 KB. The processor has a translation look-aside buffer (TLB) which can hold a total of 128-page table entries and is 4-way set associative. The minimum size of the TLB tag is:

(1) 11 bits

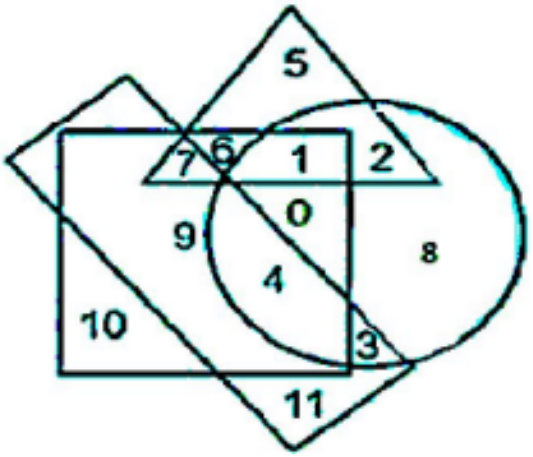
(2) 15 bits

(3) 13 bits

(4) 20 bits

---

14. In the figure, the circle stands for employed, the square stands for social worker, the triangle stands for truthful, study the figure with its regions and find the number of neither truthful nor illiterate people among the employed only.



(1) 4

(2) 3

(3) 1

(4) 11

---

15. Cache memory functions as an intermediary between

(1) RAM and ROM

(2) CPU and RAM

(3) CPU and Hard Disk

(4) None of these

---

16. Let the given numbers 11001, 1001, and 111001 correspond to the 2's complement representation. Then with which one of the following decimal numbers, the given numbers match?

(1) -25, -9, and -57, respectively

(2) -7, -7, and -7, respectively

(3) -6, -6, and -6, respectively

(4) 25, 9, and 57, respectively

---

17. The range of the exponent E in the IEEE 754 double precision (Binary 64) format is:

(1) -1023 E 1023

(2) -1022 E 1022

(3) -1023 E 1022

(4) -1022 E 1023

---

18. Which of the following components is not a part of an instruction format in CPU processing?

(1) Source operand

(2) Register file

(3) Destination operand

(4) Opcode

---

19. Any given truth table can be represented by:

(1) a product of sum Boolean expression

(2) All of the options

(3) a sum of product Boolean expression

(4) a Karnaugh map

---

20. The expression $P + QR$ is the reduced form of:

(1) $(P + Q)R$

(2) $(P + R)Q$

(3) $(P + Q)(P + R)$

(4) $PQ + QR$

General English

21. Choose the correct combination of prepositions to complete the sentence:

"The cat jumped ____ the table ____ the chair."

(1) on, from

(2) off, in

(3) into, beside

(4) onto, towards

---

22. The company's _____ growth in revenue surprised analysts.

(1) erratic

(2) gradual

(3) stagnant

(4) exponential

---

23. Identify the word that means the same as ”ostentatious”:

(1) Lavish

(2) Simple

(3) Modest

(4) Unassuming

---

24. Write the antonym for ‘Inscrutable’:

(1) Comprehensible

(2) Mysterious

(3) Opaque

(4) Obscure

---

25. Choose the best option that indicates the change of voice for the sentence given below:

Did Alice invite you?

(1) Were you invited by Alice?

(2) Was Alice invited you?

(3) Had you invited Alice?

(4) Did you invited by Alice?

---

26. Which of the following is an essential element of a technical report?

(1) Anecdotes and personal opinions

(2) Statistical data and analysis

(3) Creative storytelling

(4) Emotional appeals

---

27. Select the correct meaning of 'Peruse':

(1) Continue

(2) Pursue

(3) Examine

(4) Rescue

---

28. Which sentence demonstrates correct preposition usage?

(1) I prefer coffee over tea.

(2) He is interested on learning new languages.

(3) They were surprised of the sudden announcement.

(4) She arrived to the party at 8 PM.

---

29. Select the appropriate synonym for 'coercive':

(1) Gentle

(2) Forceful

(3) Corrective

(4) Merciful

---

30. What does the idiom "jump on the bandwagon" mean?

(1) To join a popular trend or activity

(2) To criticize something unfairly

(3) To repair a vehicle

(4) To start a business
