

Question 1: Which of the following is an irrational number?

- a) $22/7$
- b) 3.5
- c) $\sqrt{7}$
- d) 0.333...

Question 2: The sum of two rational numbers is always:

- a) Irrational
- b) Rational
- c) Real
- d) Zero

Question 3: Which pair represents two distinct real numbers?

- a) $\sqrt{16}$ and 4
- b) $\sqrt{9}$ and 3
- c) 2.5 and 2.50
- d) π and $\sqrt{3}$

Question 4: Decimal expansion of a rational number is always:

- a) Only repeating
- b) Non-terminating & non-repeating
- c) Terminating or repeating
- d) Only terminating

Question 5: The product of a nonzero rational number and an irrational number is:

- a) Irrational
- b) Rational
- c) Sometimes rational
- d) Integer

Question 6: Which of the following sets is closed under subtraction?

- a) Integers
- b) Whole numbers
- c) Natural numbers
- d) Positive integers

Question 7: If $x = \sqrt{2} + \sqrt{3}$, then $x^2 =$

- a) 5
- b) $5 + 2\sqrt{6}$
- c) $5 + \sqrt{6}$
- d) $6 + 2\sqrt{3}$

Question 8: Which statement is true?

- a) Every irrational number is rational
- b) Every real number is irrational
- c) Every rational number is irrational
- d) Every irrational number is real

Question 9: Which is the smallest number?

- a) $\sqrt{3}$
- b) -1
- c) $-\sqrt{3}$
- d) 0

Question 10: The sum of $\sqrt{2}$ and $\sqrt{8}$ is:

- a) $\sqrt{10}$
- b) 10
- c) $2\sqrt{10}$
- d) $3\sqrt{2}$

Question 11: In a triangle, two angles are in the ratio 3:7 and the third angle is 60° . The largest angle is:

- a) 48°
- b) 84°
- c) 102°
- d) 110°

Question 12: The diagonals of a rectangle are:

- a) Perpendicular
- b) Equal
- c) Equal & perpendicular
- d) Unequal

Question 13: In a right triangle, the square of the hypotenuse equals:

- a) Twice the product of the sides
- b) Difference of squares
- c) Sum of squares of other two sides
- d) Perimeter

Question 14: The mid-point theorem states:

- a) Line joining midpoints of two sides is parallel to third side
- b) Perpendicular to third side
- c) Equal to third side
- d) Half of perimeter

Question 15: Radius of in-circle of equilateral triangle of side a is:

- a) $a / 2$
- b) $a\sqrt{3} / 3$
- c) $a\sqrt{3} / 6$
- d) $a\sqrt{3} / 4$

Question 16: In a cyclic quadrilateral ABCD, if $\angle A = 70^\circ$, then $\angle C =$

- a) 60°
- b) 45°
- c) 90°
- d) 110°

Question 17: If $\triangle ABC \sim \triangle DEF$ and $AB/DE = 3/5$, then ratio of their areas =

- a) 9:25
- b) 3:5
- c) 5:3
- d) 25:9

Question 18: Longest chord of a circle is:

- a) Radius
- b) Diameter
- c) Chord parallel to radius
- d) Any secant

Question 19: Which statement is true about a rhombus?

- a) Opposite sides are unequal
- b) Diagonals are parallel
- c) Diagonals bisect at right angles
- d) All angles are 90°

Question 20: The exterior angle of a regular polygon is 30° . Number of sides =

- a) 12
- b) 10
- c) 15
- d) 6

Question 21: Solution $x + 3x/2 = 35$ is:

- a) $x = 17$
- b) $x = 3$
- c) $x = -3$
- d) $x = 14$

Question 22: Which is a linear equation?

- a) $\sqrt{x} + 5 = 0$
- b) $x^2 + 3x + 2 = 0$
- c) $2x + 3 = 0$
- d) $x^3 = 27$

Question 23: A is twice old as B. five years ago A was 3 times as old as B. find their present ages.

- a) A=10, B=30
- b) A=30, B=15
- c) A=20, B=10
- d) A=40, B=20

Question 24: Solve : $(x + 3)/6 + 1 = (6x - 1)/3$

- a) $x = -2$
- b) $x = 1$
- c) $x = -6$
- d) $x = 2$

Question 25: If $x + y = 10$ and $x - y = 4$, then $x =$

- a) 7
- b) 5
- c) 6
- d) 4

Question 26: The solution of $|2x - 3| = 5$ is:

- a) $x = 1$
- b) $x = 4$
- c) $x = 4$ or $x = -1$
- d) $x = -4$

Question 27: solve: $4x - 2 < 2x + 10$

- a) $x \leq 6$
- b) $x > 6$
- c) $x < 5$
- d) none of the above

Question 28: Solution set of $3x + 6 > 0$ is:

- a) $x > -2$
- b) $x < -2$
- c) $x = -2$
- d) $x \geq -2$

Question 29: If $2x + y = 7$ and $x - y = 1$, find x .

- a) $x = 3/4$
- b) $x = 8/3$
- c) $x = 4/3$
- d) $x = 7/2$

Question 30: Number of solutions of a pair of linear equations representing parallel lines is:

- a) 0
- b) 1
- c) Infinite
- d) 2

Question 31: Simplify: $(x + 3)(x + 2)$

- a) $x^2 + 5x + 6$
- b) $x^2 + 6$
- c) $x^2 + 3x + 2$
- d) $x^2 + 5x$

Question 32: Value of $(a - b)^3$ is:

- a) $a^2 + 2ab + b^2$
- b) $a^3 - 3a^2b + 3ab^2 - b^3$
- c) $a^3 + 3a^2b + 3ab^2 + b^3$
- d) $a^3 - 3a^2b + 3ab^2 + b^3$

Question 33: If $x + 1/x = 3$, find $x^2 + 1/x^2$.

- a) 7
- b) 3
- c) 5
- d) 9

Question 34: Factorize $x^2 - 9$.

- a) $(x - 3)(x + 3)$
- b) $(x - 9)(x + 9)$
- c) $(x - 3)^2$
- d) $(x + 3)^2$

Question 35: Coefficient of x in $(x + 2)(x + 5)$:

- a) 10
- b) 1
- c) 7
- d) 2

Question 36: Simplify: $(x + 1)^3 - (x - 1)^3$

- a) $x^3 + 1$
- b) $2x^2 + 6x$
- c) $6x + 2$
- d) $6x^2 + 2$

Question 37: If $a + b + c = 0$, then $a^3 + b^3 + c^3 =$

- a) 0
- b) abc
- c) $3abc$
- d) $a^3 + b^3$

Question 38: Solve: $x^2 + 5x + 6 = 0$

- a) $x = -2, -3$
- b) $x = 2, 3$
- c) $x = -6, 1$
- d) $x = -1, -6$

Question 39: Simplify: $(x^2 - y^2)/(x - y)$

- a) $x^2 + y^2$
- b) $x - y$
- c) $x + y$
- d) $x^2 - y^2$

Question 40: Which is not a polynomial?

- a) $x^2 + 3$
- b) $x^{-2} + 3$
- c) $x^3 - 2x + 7$
- d) $5x + 1$

Question 41: Mean of 5, 10, 15 is:

- a) 10
- b) 5
- c) 15
- d) 30

Question 42: The probability of getting exactly two heads when a fair coin is tossed three times is

- a) $1/2$
- b) $3/8$
- c) $1/4$
- d) $2/3$

Question 43: Median of 6, 8, 10, 12, 14 is:

- a) 14
- b) 8
- c) 12
- d) 10

Question 44: Mode of 2, 3, 3, 4, 5 is:

- a) 4
- b) 3
- c) 2
- d) 5

Question 45: Range of 4, 8, 15, 20 is:

- a) 12
- b) 15
- c) 16
- d) 8

Question 46: Probability of drawing a red card from a deck:

- a) $1/2$
- b) $1/4$
- c) $13/52$
- d) $2/52$

Question 47: Mean of first n natural numbers is:

- a) $n+1$
- b) $n/2$
- c) $(n+1)/2$
- d) $n/3$

Question 48: For data with equal frequencies, mean = median =

- a) Variance
- b) Range
- c) Mode
- d) Probability

Question 49: When two dice are rolled, the probability of getting co-prime numbers is:

- a) $16/36$
- b) $23/36$
- c) $18/36$
- d) $10/36$

Question 50: In a simultaneous throw of a pair of dice, find the probability of getting 8 as the sum

- a) $10/36$
- b) $06/36$
- c) $05/36$
- d) $08/36$

Question 51: For $3x^2 + 5x + 2 = 0$, the discriminant (D) is:

- a) 1
- b) -7
- c) 7
- d) 13

Question 52: Discriminant (Δ) of $ax^2 + bx + c = 0$ is:

- a) $b^2 + 4ac$
- b) $b^2 - 4ac$
- c) $b^2 - ac$
- d) $b^2 + ac$

Question 53: If roots are equal, then $b^2 - 4ac =$

- a) > 0
- b) 1
- c) < 0
- d) 0

Question 54: Sum of roots of $ax^2 + bx + c = 0$:

- a) b/a
- b) $-b/a$
- c) c/a
- d) $-c/a$

Question 55: Product of roots of $ax^2 + bx + c =$

0:

- a) $-b/a$
- b) a/c
- c) b/a
- d) c/a

Question 60: The roots of the quadratic equation $x^2 - 4x + 4 = 0$ are:

- a) Real and equal
- b) Real and distinct
- c) Imaginary
- d) None of these

Question 56: Roots of $x^2 - 5x + 6 = 0$:

- a) $x = 2, 3$
- b) $x = -2, -3$
- c) $x = 6, -1$
- d) $x = 3, -2$

Question 57: Nature of roots if $b^2 - 4ac < 0$:

- a) Real & distinct
- b) Real & equal
- c) Imaginary
- d) Equal & rational

Question 58: If one root is 2 and sum of roots = 5, other root is:

- a) -3
- b) 3
- c) 7
- d) 2

Question 59: For what value of k, roots of $x^2 + kx + 4 = 0$ are equal?

- a) $k = \pm 4$
- b) $k = 2$
- c) $k = 0$
- d) $k = \pm 2$

ROUGH WORK

(NOT TO BE EVALUATED)

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