

Question 1: If $\frac{p}{q}$ is a rational number in simplest form, which of the following can make $\frac{p}{q} + \sqrt{2}$ rational?

- a) $p = 0$
- b) $q = 1$
- c) Impossible for any integers $p, q \neq 0$
- d) $p = q$

Question 2: Find x If, $x^3 = 216$ is

- a) 12
- b) 36
- c) 6
- d) 8

Question 3: The mode of 4, 6, 7, 7, 7, 8, 9 is

- a) 6
- b) 7
- c) 8
- d) 9

Question 4: If $x=0.121212\dots$ then x can be expressed as

- a) $\frac{12}{100}$
- b) $\frac{12}{99}$
- c) $\frac{121}{1000}$
- d) $\frac{12}{101}$

Question 5: A number is both rational and a perfect square. Which of the following could it be?

- a) $\sqrt{2}$
- b) $\frac{2}{3}$
- c) $\frac{4}{9}$
- d) π

Question 6: If the sum of a rational number and an irrational number is rational, what can be concluded?

- a) Both numbers are positive
- b) The irrational number must be 0
- c) Both numbers are negative
- d) It is always possible

Question 7: Value of $3^4 \div 3^2$ is

- a) 3^2
- b) 3^6
- c) 3^8
- d) 3^1

Question 8: Which of the following statements is TRUE?

- a) Every irrational number is non-real
- b) Every rational number can be written as a fraction of two integers
- c) Every repeating decimal is irrational
- d) $\sqrt{4}$ is irrational

Question 9: In $\triangle XYZ$, sides are in the ratio 3:4:5. Which type of triangle is it?

- a) Equilateral
- b) Isosceles
- c) Right-angled
- d) Obtuse

Question 10: The coefficient of x^2 in $3x^2 + 5x - 7$ is

- a) 3
- b) 5
- c) -7
- d) 1

Question 11: In a triangle, angles are in the ratio 2:3:4. The largest angle is

- a) 60°
- b) 100°
- c) 80°
- d) 90°

Question 12: $(5^2)^3 = ?$

- a) 5^3
- b) 5^5
- c) 5^8
- d) 5^6

Question 13: The number of lines of symmetry in a rectangle is

- a) 1
- b) 2
- c) 4
- d) 0

Question 14: Solve for x if, $5x - 2(3x - 4) = 6$

- a) 2
- b) 7
- c) 4
- d) 5

Question 15: If $a^m \times a^n = 1$ and $a \neq 0$, which of the following is true?

- a) $m = n$
- b) $m + n = 1$
- c) $m + n = 0$
- d) $m - n = 1$

Question 16: If $a = 2 + \sqrt{3}$ and $b = 2 - \sqrt{3}$, then $a \times b$ is

- a) Irrational
- b) Rational
- c) 1
- d) 0

Question 17: The median of 3, 8, 9, 10, 15 is

- a) 8
- b) 9
- c) 10
- d) 15

Question 18: In $\triangle ABC$, $\angle A = 70^\circ$ and $\angle B = 50^\circ$. The exterior angle at C is

- a) 70°
- b) 120°
- c) 60°
- d) 50°

Question 19: Which of these expressions can never be a perfect square?

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

Question 20: The longest chord of a circle is its

- a) Diameter
- b) Radius
- c) Arc
- d) Secant

Question 21: Which of the following is a perfect cube?

- a) 27
- b) 16
- c) 8
- d) 64

Question 22: Which of the following numbers is a non-terminating, repeating decimal?

- a) $\frac{1}{2}$
- b) $\frac{5}{8}$
- c) $\frac{7}{11}$
- d) $\frac{3}{4}$

Question 23: Simplify: $10^5 \div 10^3$

- a) 10^8
- b) 10^2
- c) 10^{15}
- d) 10^0

Question 24: Simplify $3^2 \times 3^3 \div 3^4$

- a) 3^2
- b) 3^1
- c) 3^0
- d) 3^3

Question 25: A triangle has sides 7 cm, 24 cm, 25 cm. Find the largest angle

- a) 60°
- b) 45°
- c) 90°
- d) 100°

Question 26: Expand: $(x + 4)^2$

- a) $x^2 + 8x + 16$
- b) $x^2 + 4x + 4$
- c) $x^2 - 8x + 16$
- d) $x^2 - 4x + 4$

Question 27: The decimal representation of $\frac{7}{24}$ is

- a) Non-terminating repeating
- b) Terminating
- c) Non-terminating repeating with period 3
- d) Non-terminating non-repeating

Question 28: Two coins are tossed. What is the probability of getting exactly one head?

- a) $\frac{1}{4}$
- b) $\frac{1}{2}$
- c) $\frac{3}{4}$
- d) $\frac{1}{3}$

Question 29: The sum of three rational numbers is 7. If two of them are $\frac{2}{3}$ and $\frac{5}{4}$, the third is

- a) $\frac{23}{12}$
- b) $\frac{16}{3}$
- c) $\frac{1}{12}$
- d) $\frac{19}{12}$

Question 30: Which angle is greater than 90° but less than 180° ?

- a) Obtuse
- b) Acute
- c) Reflex
- d) Right

Question 31: Which of the following is rational but cannot be expressed as a terminating decimal?

- a) $\frac{1}{4}$
- b) $\frac{3}{8}$
- c) $\frac{1}{6}$
- d) $\frac{2}{5}$

Question 32: 4^{-2} equals

- a) 16
- b) $\frac{1}{16}$
- c) 8
- d) $\frac{1}{8}$

Question 33: Scientific notation of 5,600 is

- a) 5.6×10^3
- b) 56×10^2
- c) 0.56×10^4
- d) 56×10^3

Question 34: The value of x in $2x + 5 = 15$ is

- a) 0
- b) 10
- c) -5
- d) 5

Question 35: A bag has 5 red, 3 blue, and 2 green balls. Two balls are drawn without replacement. Probability that both are blue is

- a) $\frac{3}{10}$
- b) $\frac{1}{15}$
- c) $\frac{3}{15}$
- d) $\frac{1}{5}$

Question 36: Which of these is a binomial?

- a) $x + y$
- b) x
- c) $x + y + z$
- d) $3x$

Question 37: Which is not a measure of central tendency?

- a) Mean
- b) Mode
- c) Median
- d) Range

Question 38: The perpendicular drawn from the center of a circle to a chord

- a) Bisects the chord
- b) Is equal to radius
- c) Forms a tangent
- d) Does not intersect

Question 39: Which of these is NOT a like term of $3xy$?

- a) $-2xy$
- b) $5yx$
- c) xy^2
- d) $7xy$

Question 40: The bisectors of a triangle meet at a point. This point is

- a) Centroid
- b) Circumcenter
- c) Incenter
- d) Orthocenter

Question 41: The constant term in $5x+3y-7+2$ is

- a) -7
- b) -5
- c) 0
- d) 3

Question 42: If the mean of 5 numbers is 8, their sum is

- a) 40
- b) 45
- c) 35
- d) 50

Question 43: Simplify: $3x + 4x - 5x$

- a) $2x$
- b) $12x$
- c) $-2x$
- d) x^2

Question 44: The reciprocal of 2^{-3} is

- a) 3^{-2}
- b) 2^{-3}
- c) 3^2
- d) 2^3

Question 45: In a $\triangle ABC$, the median from vertex A is equal to half of BC. What type of triangle can this be?

- a) Equilateral
- b) Scalene
- c) Right-angled
- d) Obtuse

Question 46: Solve for x: if $2(x-3)+5 = 3x-4$

- a) 3
- b) 2
- c) 7
- d) 5

Question 47: In a right triangle, one acute angle is twice the other. Find both angles

- a) $30^\circ, 60^\circ$
- b) $45^\circ, 90^\circ$
- c) $30^\circ, 60^\circ$
- d) $40^\circ, 50^\circ$

Question 48: Solve: $3(2x-1) + 4 = 17$

- a) $\frac{5}{6}$
- b) $\frac{3}{8}$
- c) 1
- d) $\frac{8}{3}$

Question 49: Which of these is a monomial?

- a) $x^2y^3 + xy^2$
- b) $2x^2y^2$
- c) $x^2 + y^2 + z^2$
- d) $x + y$

Question 50: Which equation has no solution?

- a) $x + 2 = 2 + x$
- b) $x - 3 = 0$
- c) $3x = 6$
- d) $2x = 2x + 1$

Question 51: The perpendicular from the center of a circle to a chord

- a) Always equals radius
- b) Is tangent
- c) Bisects the chord
- d) Passes through midpoint of circle

Question 52: Solve for x if, $2(2x+1)+x=11$?

- a) $\frac{2}{5}$
- b) $\frac{8}{5}$
- c) 4
- d) $\frac{7}{5}$

Question 53: Mean of 2, 4, 6, 8 is

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

Question 54: If a triangle has angles in arithmetic progression and the smallest angle is 40° , the largest angle is

- a) 60°
- b) 80°
- c) 100°
- d) 90°

Question 55: Which of the following events has the highest probability of occurring?

- a) Getting two sixes when two dice are thrown
- b) Getting at least one tail when two coins are tossed
- c) Getting a number greater than 6 on a die
- d) Getting 1 when a die is thrown

Question 56: Two supplementary angles are in the ratio 2:3. Find the smaller angle.

- a) 60°
- b) 70°
- c) 72°
- d) 75°

Question 57: Two dice are thrown. Probability that at least one die shows an odd number is

- a) $\frac{1}{3}$
- b) $\frac{1}{2}$
- c) $\frac{3}{4}$
- d) $\frac{2}{3}$

Question 58: The product of $(x + 3)$ and $(x - 3)$ is

- a) $x^2 - 9$
- b) $x^2 + 9$
- c) $x^2 + 6x + 9$
- d) $x^2 - 6x + 9$

Question 59: A cyclic quadrilateral has angles in ratio 1:2:3:4. Find the smallest angle

- a) 40°
- b) 36°
- c) 44°
- d) 56°

Question 60: The multiplicative inverse of $\frac{3}{5}$ is

a) $\frac{3}{5}$

b) $\frac{5}{3}$

c) $\frac{-3}{5}$

d) $\frac{-5}{3}$

ROUGH WORK

(NOT TO BE EVALUATED)

DATE

[illegible]