

Time: 3 Hours

Max. Marks: 80

Instructions:

1. The question paper has 4 sections and 33 questions. Answer all the questions.
2. Section A: 20 multiple choice questions of 1 mark each. Write the letter of the correct answer.
3. Section B: 4 questions of 2 marks each. Section C: 5 questions of 4 marks each.
4. Section D: 4 questions of 8 marks each. Each question in Section D has an internal choice.
5. Draw figures and graphs neatly wherever necessary.

SECTION – A

20 × 1 = 20

Choose the correct answer and write its letter.

1. Every rational number is a
A) natural number B) integer C) real number D) whole number
2. Which of the following is a rational number?
A) $\sqrt{2}$ B) π C) 0.333... D) $\sqrt{3}$
3. The value of $(27)^{1/3}$ is
A) 3 B) 9 C) 27 D) $1/3$
4. 0.333... (0.3 with bar) in the form p/q is
A) $3/10$ B) $1/3$ C) $3/100$ D) $33/100$
5. The rationalising factor of $\sqrt{5}$ is
A) 5 B) $\sqrt{5}$ C) $1/5$ D) 25
6. A polynomial of degree one is called a
A) constant polynomial
B) linear polynomial
C) quadratic polynomial
D) cubic polynomial
7. The coefficient of x^2 in $3x^3 - 2x^2 + x$ is
A) 3 B) 2 C) -2 D) 1
8. The degree of the zero polynomial is
A) 0 B) 1 C) not defined D) -1
9. If $x - 2$ is a factor of $x^2 + kx + 2$, then $k =$
A) 3 B) -3 C) 2 D) -2
10. Using an identity, $99^2 =$
A) 9801 B) 9081 C) 9901 D) 9899
11. The point where the x-axis and the y-axis meet is called the
A) abscissa B) ordinate C) origin D) quadrant
12. The point (0, -4) lies on the
A) positive x-axis B) negative x-axis C) positive y-axis D) negative y-axis

13. The ordinate of the point $(-3, 6)$ is
A) -3 B) 6 C) 3 D) -6
14. The distance of the point $(-6, 0)$ from the y-axis is
A) 0 units B) 6 units C) -6 units D) 12 units
15. The graph of $y = 3$ is a line parallel to the
A) x-axis B) y-axis C) line $y = x$ D) none of these
16. A linear equation in two variables has
A) no solution
B) only one solution
C) only two solutions
D) infinitely many solutions
17. "Things which are equal to the same thing are equal to one another." This is Euclid's
A) axiom B) postulate C) theorem D) definition
18. "A terminated line can be produced indefinitely" is Euclid's postulate number
A) 1 B) 2 C) 3 D) 5
19. The complement of 35° is
A) 145° B) 55° C) 65° D) 325°
20. $\angle A$ and $\angle B$ form a linear pair. If $\angle A = 75^\circ$, then $\angle B =$
A) 15° B) 75° C) 105° D) 285°

SECTION – B

$4 \times 2 = 8$

21. Express 0.375 in the form p/q in its lowest terms.
22. Find $p(0)$, $p(1)$ and $p(2)$ for $p(y) = y^2 - y + 1$.
23. Without plotting, write the quadrant in which each point lies: $(-5, -3)$, $(4, -2)$, $(-1, 6)$, $(2, 7)$.
24. Write any two of Euclid's axioms.

SECTION – C

$5 \times 4 = 20$

25. Find three rational numbers between $3/5$ and $4/5$.
26. Check whether $x - 1$ is a factor of $x^3 - 6x^2 + 11x - 6$. Hence factorise the polynomial completely.
27. Write the equation $2x + 3y = 6$ with y expressed in terms of x . Check which of the points $(3, 0)$, $(0, 2)$ and $(1, 1)$ are solutions of the equation.
28. Evaluate using suitable identities: (i) 105×106 (ii) $(998)^2$
29. (i) Two supplementary angles are in the ratio $4 : 5$. Find the angles. (ii) An angle is 24° more than its complement. Find the angle.

SECTION – D

$4 \times 8 = 32$

Each question has an internal choice. Answer either (a) or (b).

30. a) Locate $\sqrt{5}$ on the number line. Write the steps of construction.

(OR)

- b) If $(5 + 2\sqrt{3})/(7 + 4\sqrt{3}) = a + b\sqrt{3}$, find the values of a and b .

31. a) Factorise: $x^3 + 13x^2 + 32x + 20$

(OR)

b) If $x + y + z = 0$, show that $x^3 + y^3 + z^3 = 3xyz$. Hence find the value of $(-12)^3 + (7)^3 + (5)^3$ without actually calculating the cubes.

32. a) Draw the graph of $2x + y = 6$. Find the points where the line cuts the two axes, and find the area of the triangle formed by the line and the coordinate axes.

(OR)

b) The taxi fare in a city is ₹ 8 for the first kilometre and ₹ 5 for every subsequent kilometre. Taking the distance covered as x km and the total fare as ₹ y , write a linear equation for this information and draw its graph.

33. a) Prove that the bisectors of the two angles of a linear pair are at right angles to each other.

(OR)

b) Write Euclid's five postulates. Which of them deals with parallel lines? State Playfair's axiom, which is equivalent to it.

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