

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. Which of the following is an irrational number?
A) 0.25 B) $\sqrt{16}$ C) $\sqrt{7}$ D) $\frac{22}{7}$
2. The decimal expansion of $\frac{1}{7}$ is
A) terminating
B) non-terminating and recurring
C) non-terminating and non-recurring
D) a whole number
3. A rational number between 2 and 3 is
A) 2.5 B) $\sqrt{5}$ C) 3.1 D) $\sqrt{10}$
4. The value of $(64)^{\frac{1}{2}}$ is
A) 4 B) 8 C) 16 D) 32
5. $2^3 \times 2^2 =$
A) 2^5 B) 2^6 C) 4^5 D) 2^1
6. The degree of the polynomial $5x^3 + 4x^4 + 7$ is
A) 3 B) 4 C) 7 D) 1
7. The zero of the polynomial $p(x) = 2x - 6$ is
A) 2 B) 3 C) -3 D) 6
8. If $p(x) = x^2 - 3x + 2$, then $p(1) =$
A) 0 B) 1 C) 2 D) 6
9. The remainder when $x^3 + 1$ is divided by $x + 1$ is
A) 0 B) 1 C) 2 D) -1
10. $(a + b)^2 =$
A) $a^2 + b^2$ B) $a^2 + 2ab + b^2$ C) $a^2 - 2ab + b^2$ D) $2a + 2b$
11. The point $(-3, 5)$ lies in the
A) I quadrant B) II quadrant C) III quadrant D) IV quadrant
12. The abscissa of the point $(4, -7)$ is
A) 4 B) -7 C) 3 D) -3

13. Which of the following points lies on the y-axis?
A) (2, 0) B) (0, -3) C) (1, 1) D) (3, 3)
14. In the equation $2x + 3y = 12$, if $x = 0$, then $y =$
A) 3 B) 4 C) 6 D) 12
15. The equation of the x-axis is
A) $x = 0$ B) $y = 0$ C) $x = y$ D) $x + y = 0$
16. $x = 2, y = 1$ is a solution of
A) $x + y = 3$ B) $x - y = 3$ C) $2x + y = 3$ D) $x + 2y = 5$
17. According to Euclid, the number of lines that can pass through two distinct points is
A) 0 B) 1 C) 2 D) infinitely many
18. The name of Euclid's famous book is
A) Elements B) Principia C) Siddhanta D) Lilavati
19. The supplement of 70° is
A) 20° B) 110° C) 290° D) 70°
20. When two lines intersect, the vertically opposite angles are
A) supplementary B) complementary C) equal D) unequal

SECTION – B

$4 \times 2 = 8$

21. Find any two irrational numbers between 2 and 3.
22. Factorise: $x^2 + 5x + 6$
23. Without plotting, write the quadrant or axis on which each point lies: $(-2, 4)$, $(3, -1)$, $(-1, 0)$, $(1, 2)$.
24. An angle is equal to its complement. Find the angle.

SECTION – C

$5 \times 4 = 20$

25. Express $0.474747\ldots$ (that is, 0.47 with bar) in the form p/q , where p and q are integers and $q \neq 0$.
26. Using the Remainder Theorem, find the remainder when $x^3 + 3x^2 + 3x + 1$ is divided by $x + 1$. Is $x + 1$ a factor of the polynomial? Give reason.
27. Find four different solutions of the equation $2x + y = 7$.
28. (i) Simplify: $(\sqrt{5} + \sqrt{2})^2$ (ii) Rationalise the denominator of $1/(\sqrt{7} - 2)$.
29. Two lines AB and CD intersect at O. If $\angle AOC = 3x$ and $\angle BOD = 2x + 20^\circ$, find x and all the four angles formed at O.

SECTION – D

$4 \times 8 = 32$

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

30. a) (i) If $(3 + \sqrt{7})/(3 - \sqrt{7}) = a + b\sqrt{7}$, find the values of a and b .
(ii) Simplify: $2^{1/2} \times 2^{1/5}$ (iii) Simplify: $(1/3^3)^7$

(OR)

b) Locate $\sqrt{3}$ on the number line. Write the steps of construction.

31. a) Factorise: $x^3 - 2x^2 - x + 2$

(OR)

b) Using suitable identities: (i) evaluate 104×96 (ii) evaluate $(103)^3$ (iii) factorise $4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$

32. a) Plot the points A(2, 3), B(-3, 2), C(-2, -4) and D(3, -1) on graph paper. Name the quadrant in which each point lies, and join them in order to form the figure ABCD.

(OR)

b) Draw the graph of the linear equation $x + y = 4$. From the graph, find the points where the line meets the x-axis and the y-axis. Check whether the point (1, 3) lies on the line.

33. a) Prove that if two lines intersect each other, then the vertically opposite angles are equal.

(OR)

b) Two parallel lines l and m are cut by a transversal t. The two interior angles on the same side of the transversal are $(3x + 10)^\circ$ and $(2x - 5)^\circ$. Find x and the measures of all the eight angles formed. Draw a neat figure.

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