

Time : 3 Hours 15 Min.]

[Maximum Marks : 100

Instructions :

1. In the duration of 3 hours 15 minutes, 15 minutes of time is allotted to read the question paper.
2. All the answers shall be written in the separate answer booklet only.
3. Question paper consists of 4 Sections which includes 33 Questions.
4. Internal choice is available in Section IV only.
5. Answers shall be written neatly and legibly.

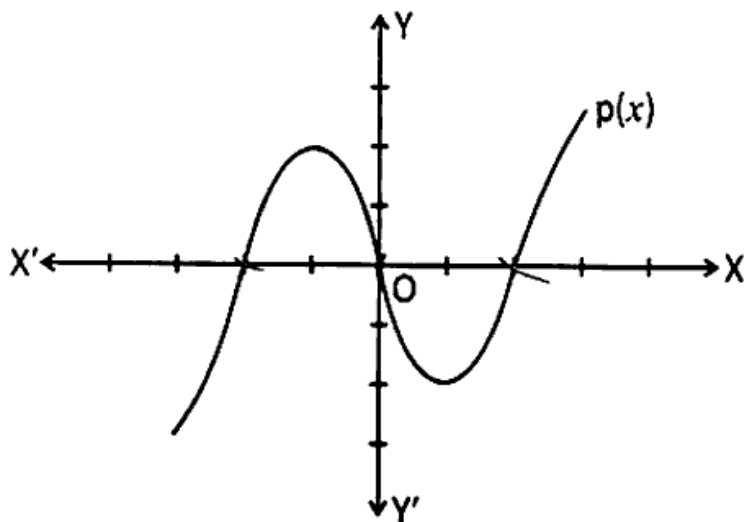
Section – I

(12 × 1 = 12 Marks)

Note : (1) Answer all the questions in one word or phrase.

(2) Each question carries 1 mark.

1. Express $\frac{7}{25}$ in decimal form.
2. Express the set $P = \{x : x \text{ is a prime, } x < 5\}$ in roaster form.
3. Find the number of zeroes of the polynomial $p(x)$, whose graph is given.



4. What is the common ratio of the G.P. $25, -5, 1, \frac{-1}{5}, \dots$?

5. Match the following :

Equation	Solution
(a) $x + y = 5$	(p) (3, 3)
(b) $2x - y = 9$	(q) (1, 4)
(c) $x - y = 0$	(r) (5, 1)

Choose the correct answer.

- (A) $a \rightarrow r, b \rightarrow p, c \rightarrow q$
- (B) $a \rightarrow p, b \rightarrow q, c \rightarrow r$
- (C) $a \rightarrow q, b \rightarrow r, c \rightarrow p$
- (D) $a \rightarrow r, b \rightarrow q, c \rightarrow p$

6. **Assertion :** (0, 2) is a point on Y-axis.

Reason : Every point on Y-axis is at a distance of zero units from the Y-axis.

Now, choose the correct answer.

- (A) Both Assertion and Reason are true. Reason is supporting the Assertion.
- (B) Both Assertion and Reason are true, but Reason is not supporting the Assertion.
- (C) Assertion is True, but Reason is False.
- (D) Assertion is False, but Reason is True.

7. **Statement-I :** The lengths 3 cm, 4 cm, 5 cm form a right angled triangle.

Statement-II : If 'a' is the side of an equilateral triangle, then its height is $\sqrt{3} a$.

Now, choose the correct answer.

- (A) Statement-I and Statement-II both are True.
- (B) Statement-I and Statement-II both are False.
- (C) Statement-I is True. Statement-II is False.
- (D) Statement-I is False. Statement-II is True.

8. The tangents drawn at the end points of a diameter are _____.

9. Which of the following is not true ?

- (A) $\sin(90^\circ - \theta) = \operatorname{cosec} \theta$
- (B) $\sin^2 \theta + \cos^2 \theta = 1$
- (C) $\operatorname{cosec} \theta \cdot \sin \theta = 1$
- (D) $\sin 90^\circ = 1$

10. At a particular time, if the angle of elevation of the sun is 45° , then the length of the shadow of a 5 m high tree is _____.

- (A) $5\sqrt{3}$ m
- (B) 10 m
- (C) 5 m
- (D) $\frac{5}{\sqrt{3}}$ m

11. If $P(E) = 0.3$, then $P(\text{not } E) =$ _____.

- (A) 0.3
- (B) $\frac{1}{3}$
- (C) 0
- (D) 0.7

12. In the classes 35 – 39, 40 – 44, 45 – 49, of a frequency distribution, then the upper boundary of the class 40 – 44 is _____.

Section – II**(8 × 2 = 16 Marks)****Note : (1) Answer all the questions.****(2) Each question carries 2 marks.**

13. Evaluate : $\log_2 (1 + \tan^2 45^\circ)$
14. Check whether -3 and 3 are the zeroes of the polynomial $x^2 - 9$ or not.
15. "Sum of the two numbers is 82 and their difference is 38." Represent this information in the form of pair of linear equations with variables 'x' and 'y'.
16. If the slope of the line passing through the points R(2, y) and S(x, 3) is 2, then find the relation between 'x' and 'y'.
17. If ABC is an isosceles triangle, right angled at C, then prove that $AB^2 = 2AC^2$.
18. The length of the tangent drawn from an external point R to a circle is 24 cm and the distance of R from the centre of the circle is 25 cm. Find the radius of that circle.
19. A person is flying a kite at an angle of elevation α and the length of the thread from his hand to kite is 'l'. Draw a rough diagram for the above situation.
20. Median of the observations $\frac{x}{5}, x, \frac{x}{4}, \frac{x}{2}, \frac{x}{3}$ is 7. Find the value of x.

Section – III**(8 × 4 = 32 Marks)****Note : (1) Answer all the questions.****(2) Each question carries 4 marks.**

21. Show that the following sets are equal :
- (i) $A = \{x : x \text{ is a letter in the word 'FOLLOW'}\}$
 - (ii) $B = \{x : x \text{ is a letter in the word 'FLOW'}\}$
 - (iii) $C = \{x : x \text{ is a letter in the word 'WOLF'}\}$
22. Which term of the A.P. : 3, 8, 13, 18, ... is 78 ?
23. If (1, 2), (4, y), (x, 6) and (3, 5) are the vertices of a parallelogram taken in order, find 'x' and 'y'.
24. A ladder 25 m long reaches a window of building 24 m above the ground. Determine the distance of the foot of the ladder from the building.
25. If $\tan \theta = \frac{5}{12}$, then find $\sec \theta$ and $\operatorname{cosec} \theta$.
26. A tower stands vertically on the ground. From a point which is 15 meters away from the foot of the tower, the angle of elevation of the top of the tower is 45° . What is the height of the tower ?
27. A die is thrown once. Find the probability of getting (i) a Prime number (ii) a number lying between 1 and 5.
28. Write the formula to find the 'mode' of a grouped data and explain the terms involved in it.

Section – IV

(5 × 8 = 40 Marks)

Note : (1) Answer all the questions.

(2) Each question carries 8 marks.

(3) There is an internal choice for each question.

29. (a) Prove that
- $\sqrt{3}$
- is irrational.

OR

(b) If $\sec \theta + \tan \theta = p$, then prove that $\sin \theta = \frac{p^2 - 1}{p^2 + 1}$.

30. (a) If
- $A = \{2, 3, 4, 5, 6\}$
- ,
- $B = \{1, 3, 5, 7\}$
- ,
- $C = \{2, 4, 6, 8\}$
- ,
- $D = \{2, 3, 5, 7\}$
- , then find

(i) $A \cup B$

(ii) $B \cap D$

(iii) $C \cap D$

(iv) $D - A$

OR

- (b) Find
- x
- so that
- $x, x + 2, x + 6$
- are consecutive terms of a Geometric Progression.

31. (a) Find the value of 'k' for which the points
- $(7, -2), (5, 1), (3, k)$
- are collinear.

OR

- (b) The table below shows the daily expenditure on food of 30 households in a locality :

Daily Expenditure (in Rupees)	100 – 150	150 – 200	200 – 250	250 – 300	300 – 350
Number of households	4	5	12	6	3

Find the mean daily expenditure on food by a suitable method.

32. (a) 5 pencils and 7 pens together cost ₹ 95. Whereas 7 pencils and 5 pens together cost ₹ 85. Find the cost of one pencil and that of one pen.

OR

- (b) One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting

(i) a king of black colour

(ii) a face card

(iii) a spade

(iv) a card not a heart

33. (a) Draw the graph of the polynomial
- $P(x) = x^2 - 3x - 4$
- and find the zeroes.

OR

- (b) Draw a pair of tangents to a circle of radius 4 cm which are inclined to each other at an angle
- 60°
- .