This Question Paper contains 12 printed pages.
(Section - A, B, C & D)

Sl.No.

18 (E)

(MARCH, 2024)

Time : 3 Hours] *[Maximum Marks : 80*

Instructions :

1) **Write in a clear legible handwriting.**
2) **This question paper has four Sections A, B, C & D and Question Numbers from 1 to 54.**
3) **All Sections are compulsory. Internal options are given.**
4) **The numbers to the right represent the marks of the question.**
5) **Draw neat diagrams wherever necessary.**
6) **New sections should be written in a new page. Write the answers in numerical order.**
7) **Calculator, digital watch or smart watch is not allowed.**

SECTION - A

- **Answer the following as per instruction given (Questions : 1 to 24) (1 mark each).** **[24]**
- **Choose the correct option from the question given below (Questions : 1 to 6). (1 mark each).**

1) For a given pair of linear equations in two variables, if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ then equation has _____ solution. **[1]**

(A) One (B) Two

(C) Three (D) No solution

2) If the two roots of quadratic equation $ax^2 + bx + c = 0\ (a \neq 0)$ are real and equal then _____. [1]

(A) $b^2 - 4ac < 0$ (B) $b^2 - 4ac = 0$

(C) $b^2 - 4ac > 0$, (D) $b^2 - 4ac \neq 0$

3) For the AP : 4, 10, 16, 22, ... common difference (d) is _____. [1]

(A) 8 (B) 5

(C) 6 . (D) 12

4) The distance between the points (0, 5) and (–5, 0) is _____. [1]

(A) 5 (B) $5\sqrt{2}$

(C) $2\sqrt{5}$ (D) 10

5) $\sec^2\theta - \tan^2\theta =$ _____. [1]

(A) 0 (B) 1

(C) –1 (D) 2

6) For any data $\overline{X} = 25$ and $Z = 25$ then $M =$ _____. [1]

(A) 25 (B) –25

(C) 5 (D) –5

■ **Fill in the blanks with correct option as to make the given statement correct : (Questions : 7 to 12). (1 mark each).**

7) $3 + 2\sqrt{5}$ is a/an _____ number. (rational, irrational, negative integer) [1]

8) The sum of zeroes of quadratic polynomial $4x^2 - 3x - 7$ is _____. $\left(\frac{3}{4}, \frac{4}{3}, \frac{7}{3}\right)$ [1]

9) When a coin is tossed three times, the total number of possible outcomes is _____. (4, 6, 8) [1]

10) $\tan\theta \cdot \cot\theta =$ _____. (−1, 0, 1) [1]

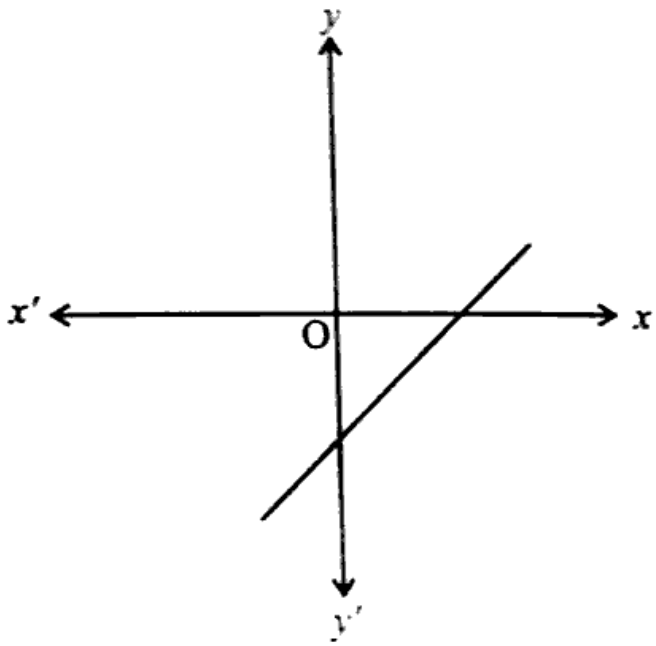
11) A circle can have _____ parallel tangents at the most. (1, 2, 3) [1]

12) Median of −2, −3, 0, 1, 3, 2, 7 is _____. (−2, 1, 3) [1]

■ State True or False for statements given below : (Questions : 13 to 16). (1 mark each).

13) H.C.F. of 17, 23 and 29 is 1. [1]

14) Number of zeroes of $y = p(x)$ is 2 from figure given below. [1]



15) If the pair of linear equations in two variables are $2x + 3y = 12$ and $3x + 2y = 18$ then $x + y = 5$. [1]

16) The probability of an impossible event is zero (0). [1]

■ **Answer the following in one sentence or one word or number (Questions 17 to 20). (1 mark each).**

17) $a, 2a, 3a, 4a,$ **is an Arithmetic Progression or not?** **[1]**

18) **How many tangents can be drawn to a circle passing through a point lying inside the circle?** **[1]**

19) **A die is thrown once. What is the probability of not getting number 6?** **[1]**

20) **Find the mean of First 11 Natural Numbers.** **[1]**

■ **Match the pairs : (Questions : 21 to 24). (1 mark each).** **[4]**

	A	B
21)	Base area of hemisphere	(a) $2\pi rh$
22)	Volume of a 5 rupee coin	(b) πr^2
		(c) $\pi r^2 h$

	A	B
23)	Length of an arc of a sector of angle θ	(a) πd
24)	Circumference of a circle	(b) πr
		(c) $\frac{\pi r\theta}{180}$

SECTION - B

■ **Answer the following briefly with calculation : (Any 9) (Questions : 25 to 37) (2 marks each).** **[18]**

25) Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$. **[2]**

26) Find a quadratic polynomial whose sum and product of its zeroes are $-\frac{1}{4}$ and $\frac{1}{4}$ respectively. **[2]**

27) Find the roots of the quadratic equation $x^2 - 3x - 10 = 0$ by factorisation method. **[2]**

28) Find the 10^{th} term of the AP : 2, 7, 12, ...:. **[2]**

29) Find the sum of the first 1,000 positive integers. **[2]**

30) Find the distance between the points (2, 3) and (4, 1) using distance formula. **[2]**

31) Find the values of y for which the distance between the points P(2, –3) and Q(10, y) is 10 units. **[2]**

32) If $\sin\theta = 4/5$, calculate $\cos\theta$ and $\tan\theta$. **[2]**

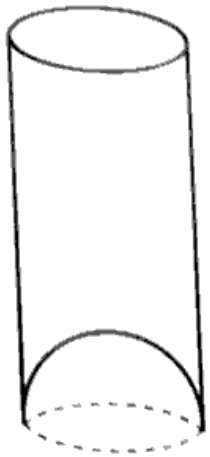
33) Evaluate : **[2]**

$$\sin 60° \cos 30° + \sin 30° \cos 60°$$

34) A tower stands vertically on the ground. From a point on the ground, which is 15 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60°. Find the height of the tower. |2|

35) 2 cubes each of volume 125 cm^3 are joined end to end. Find the volume of the resulting cuboid. |2|

36) A juice seller was serving his customers using glasses as shown in the figure. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of a glass was 10 cm. Find the apparent capacity of the glass. (Use $\pi = 3.14$) |2|



Figure

37) Find Median for the classical distribution data when $n = 53$, $l = 60$, $cf = 22$, $f = 7$ and $h = 10$. |2|

SECTION - C

Answer the following questions any 6 from 38 to 46. (9 questions). (3 marks each). **[18]**

38) Solve the following pair of linear equations by the substitution method. **[3]**

$2x + 3y = 11$

$2x - 4y = -24$

39) Solve the following pair of linear equations by elimination method. **[3]**

$3x - 5y - 4 = 0$

$9x = 2y + 7$

40) Find the sum of the first 40 positive integers divisible by 7. **[3]**

41) Find the coordinates of a point A, where AB is the diameter of a circle whose centre is (2, –3) and B(1, 4). **[3]**

42) Find the coordinates of the points of trisection of the line segment joining (4, –1) and (–2, –3). **[3]**

43) Prove that "The lengths of tangents drawn from an external point to a circle are equal. **[3]**

44) Two concentric circles are of radii 41 cm and 40 cm. Find the length of the chord of the larger circle which touches the smaller circle. **[3]**

45) The following table shows the ages of the patients admitted in a hospital during a year: [3]

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

Find the mode of the data given above.

46) A Piggy bank contains hundred 50 p coins, fifty ₹1 coins, twenty ₹ 2 coins and ten ₹ 5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin : [3]

i) Will be a 50 p coin?

ii) Will not be a ₹ 5 coin?

iii) Will be a ₹ 1 coin?

SECTION - D

■ **Answer the following questions any 5 from 47 to 54 (8 Questions) with calculation : (4 marks each).** [20]

47) State Basic proportionality theorem and prove it. [4]

48) A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds. [4]

49) The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides. [4]

50) A manufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year, find : **[4]**

i) the production in the 1st year.

ii) the production in the 10th year.

iii) the total production in first 7 years.

51) The table below shows the daily Expenditure on food of 25 households in a locality. **[4]**

Daily Expenditure (in ₹)	100-150	150-200	200-250	250-300	300-350
Number of Households	4	5	12	2	2

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

52) If the median of the distribution given below is 28.5, find the values of x and y. **[4]**

Class Interval	Frequency
0 - 10	5
10 - 20	x
20 - 30	20
30 - 40	15
40 - 50	y
50 - 60	5
Total	60

53) One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting : **[4]**

i) A red face card.

ii) The jack of hearts.

iii) An ace of black colour

iv) Not an ace

54) A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 (see the Figure) and these are equally likely outcomes. What is the probability that it will point at **[4]**

i) 8?

ii) an odd number?

iii) a number greater than 2?

iv) a number less than 9?