A–3–Z

Total No. of Questions : 40]   [Total No. of Printed Pages : 15

XARJKUT23
9303–Z
MATHEMATICS

Time : 3 Hours]   [Maximum Marks : 80

Section–A   1 each

1. The number 1 is :

    (A) a prime number

    (B) a composite number

    (C) an even number

    (D) None of these

2. Zeroes of the quadratic polynomial $4x^2 + 8x$ are :

   (A) 0, –2

   (B) 0, 2

   (C) 0, 4

   (D) None of these

3. The 10th term of the A.P. 1, 4, 7, ... is :

   (A) 18

   (B) 28

   (C) 8

   (D) None of these

4. Distance between the points (x, y) and $(0, 0)$ is :

(A) $\sqrt{x^2 - y^2}$

(B) $\sqrt{x + y}$

(C) $\sqrt{x^2 + y^2}$

(D) None of these

5. For what value of K : $4x + 6y = 11$ and $2x + Ky = 7$ are inconsistent ?

(A) K = 2

(B) K = 3

(C) K = 4

(D) None of these

6   Length of an arc of a sector of angle θ is :

(A) $\dfrac{\theta}{360} \times \pi r$

(B) $\dfrac{\theta}{360} \times \pi r^2$

(C) $\dfrac{\theta}{360} \times 2\pi r$

(D)   None of these

7.   From a point inside the circle the number of tangents that can be drawn is :

(A)   1

(B)   0

(C)   2

(D)   None of these

8. A card is drawn from a pack of 52 cards. What is the probability of getting an Ace card ?

    (A) $\dfrac{1}{13}$

    (B) $\dfrac{1}{26}$

    (C) $\dfrac{4}{13}$

    (D) None of these

9   cot A is not defined for :

    (A) A = 90°

    (B) A = 0°

    (C) A = 45°

    (D) None of these

10. The quadratic equation $x^2 + 4x + 5 = 0$ has discriminant equal to :

(A) 4

(B) –4

(C) 20

(D) None of these

11. If p, q are two prime numbers, then L.C.M. (p, q) is ....

(Fill in the blank)

12. The series 2, 4, 8, 16, ... is an A.P.   (True/False)

Or

The next term of the A.P. $\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3}$, ... is $\frac{17}{3}$.   (True/False)

13. The value of sin θ increases as θ increases.   (True/False)

14. All squares are ....   (Similar/Congruent)

15. A line intersecting the circle at two different points is called

....   (Fill in the blank)

16. Write the formula for finding the area of triangle whose vertices are

(x_1, y_1), (x_2, y_2) and (x_3, y_3).

Or

Define Collinear Points.

17. State AA similarity criterion for two triangles.

18. Define Line of Sight.

19. What is the sum of the probabilities of all the elementary events of

an experiment ?

20. Write the formula for volume of a sphere.

Section–B   2 each

21. Find the H.C.F. of 336 and 54.

22. A drinking glass is in the shape of a frustum of a cone of height

    14 cm. The diameters of its two circular ends are 4 cm and 2 cm.

    Find the capacity of the glass.

23. Solve the pair of linear equations :

$$3x + 4y = 10$$

$$2x - 2y = 2$$

    by substitution method.

24. Given $15 \cot A = 8$, find $\sin A$ and $\sec A$.

Or

Evaluate :

$$2 \tan^2 45° + \cos^2 30° - \sin^2 60°$$

25. A bag contains 3 red balls and 5 black balls. A ball is drawn at random from the bag. What is the probability that the ball drawn is :

(i)   red ?

(ii) not red ?

26. A class teacher has the following absentee record of 40 students of a class for the whole term. Find the mean number of days a student was absent :

Number of Days	Number of Students
0–6	11
6–10	10
10–14	7
14–20	4
20–28	4
28–38	3
38–40	1

Section–C

3 each

27 Obtain all other zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of

its zeroes are $\sqrt{\dfrac{5}{3}}$ and $-\sqrt{\dfrac{5}{3}}$

Or

Find a quadratic polynomial, the sum and product of whose zeroes

are $\sqrt{2}$ and $\dfrac{1}{3}$, respectively.

28. A fraction becomes $\dfrac{1}{3}$ when 1 is subtracted from the numerator and

it becomes $\dfrac{1}{4}$ when 8 is added to its denominator. Find the fraction.

29. Find the roots of the quadratic equation $2x^2 + x - 6 = 0$ by

factorization.

30. Find the 31st term of an A.P. whose 11th term is 38 and the 16th

term is 73.

Or

Find the sum of the first 15 multiples of 8.

31. Write all the other trigonometric ratios of $\angle A$ in terms of sec A.

32. Prove that the lengths of tangents drawn from an external point to a circle are equal.

Or

The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle.

33. Find the area of a quadrant of a circle whose circumference is 22 cm.

34. How many silver coins, 1.75 cm in diameter and of thickness 2 mm, must be melted to form a cuboid of dimensions 5.5 cm $\times$ 10 cm $\times$ 3.5 cm ?

Section–D

4 each

35. A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

Or

Find the roots of $4x^2 + 3x + 5 = 0$ by the method of completing the square.

36 The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. Prove that the height of the tower is 6 m

Turn Over

37. Find the area of the quadrilateral whose vertices taken in order, are

(–4, –2), (–3, –5), (3, –2) and (2, 3).

Or

If A and B are (–2, –2) and (2, –4), respectively, find the coordinates of P such that $AP = \dfrac{3}{7} AB$ and P lies on the line segment AB.

38. Prove that the line joining the mid-points of any two sides of a triangle is parallel to the third side.

Or

In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.

39. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60°.

40. If the median of the distribution given below is 28.5, find the values of x and y :

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