

**A-3-X**

Roll No.....

Total No. of Questions : 40]

[Total No. of Printed Pages : 15

**XARJKUT23**

**9303-X**

**MATHEMATICS**

**Time : 3 Hours]**

**[Maximum Marks : 80**

**Section-A**

**1 each**

1. The number 3 is :

(A) an even number

(B) a composite number

(C) a prime number

(D) None of these

XARJKUT23-9303-X

Turn Over

**A-3-X**

( 2 )

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

(A) 2, -4

(B) 2, 4

(C) -2, -4

(D) None of these

3. 8th term of an A.P. 10, 7, 4, ..... is :

(A) -11

(B) -10

(C) -8

(D) None of these

( 3 )

4. Distance between the points (4, 3) and (0, 0) is :

(A)  $\sqrt{7}$

(B) 5

(C) 12

(D) None of these

5. If  $6x + 3y = C - 3$  and  $12x + Cy = C$ , has infinitely many solutions, then C is equal to :

(A) 6

(B) 5

(C) 4

(D) None of these

6. Circumference of a semi-circle with radius 'r' is :

(A)  $2\pi r$

(B)  $\pi r$

(C)  $\pi r^2$

(D) None of these

7. How many parallel tangents can a circle have ?

(A) 2

(B) 1

(C) Infinite

(D) None of these

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

- (A)  $\frac{1}{26}$
- (B)  $\frac{1}{2}$
- (C)  $\frac{1}{4}$
- (D) None of these

9.  $1 - \cos^2 30^\circ$  is equal to :

- (A)  $-\sin^2 30^\circ$
- (B)  $\sin^2 30^\circ$
- (C)  $-\sin^2 60^\circ$
- (D) None of these

10. The product of roots of the quadratic equation  $\sqrt{5}x^2 + 3x - 5 = 0$

is :

(A)  $\sqrt{5}$

(B)  $\frac{1}{\sqrt{5}}$

(C)  $-\sqrt{5}$

(D) None of these

11. H.C.F. of two prime numbers is ..... . (Fill in the blank)

12. The sum of first  $n$  natural numbers is  $\frac{n(n+1)}{2}$ . (True/False)

Or

The next term of the A.P.  $\sqrt{27}, \sqrt{48}, \sqrt{75}, \dots$  is  $\sqrt{108}$ .

(True/False)

XARJKUT23-9303-X

A-3-X

13. The value of  $\cos \theta$  increases as  $\theta$  increases. (True/False)

14. All ..... triangles are similar. (isosceles, equilateral)

15. The common point of a tangent to a circle and the circle is called

..... (Fill in the blank)

16. Define Distance Formula.

Or

Define Ordinate of a Point.

17. State Basic Proportionality Theorem.

18. Define Angle of Elevation.

19. What is the probability of sure event ?

( 8 )

20. Write the formula for total surface area of hemisphere.

**Section-B**

2 each

21. Find the H.C.F. of 510 and 92.

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 :

$$x + y = 5$$

$$2x - 3y = 4$$

by elimination method.

( 9 )

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

Or

Evaluate :

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

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 :

( 10 )

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  $\sqrt{\frac{5}{3}}$  and  $-\sqrt{\frac{5}{3}}$ .

XARJKUT23-9303-X

**A-3-X**

*Or*

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

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

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

it becomes  $\frac{1}{4}$  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.

7. 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  $AP = \frac{3}{7}AB$  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.

( 15 )

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

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
<b>Total</b>	<b>60</b>