

10thARFJD(S/Z) JKUT-2026

1303-C

MATHEMATICS

Time : 3 Hours]

[Maximum Marks : 80

SECTION-A

(1 mark each)

1. The L.C.M and H.C.F of 6 and 120 are :

(a) 36, 12

(b) 12, 36

(c) 36, 120

(d) None of these

2. The 14th term of the A.P. : $-5, -1, 3, 7, \dots$ is :
- (a) 47, (b) 74
- (c) 45 (d) None of these
3. If the equations $x + 2y = 8$ and $2x + 4y = 16$ are given, then the lines are:
- (a) Parallel (b) Coincident
- (c) Intersecting at one point (d) None of these
4. A quadratic polynomial can have at most :
- (a) 4 zeroes (b) 3 zeroes
- (c) 2 zeroes (d) None of these

5. $\frac{1 - \tan^2 45^\circ}{1 + \tan^2 45^\circ}$ is equal to :

(a) $\tan 90^\circ$

(b) 0

(c) $\sin 45^\circ$

(d) None of these

6. Which of the following is a prime factor of 156 ?

(a) 6

(b) 39

(c) 13

(d) None of these

7. The distance between the points (0, 3) and (0, 8) is :

(a) $\sqrt{5}$

(b) 5

(c) 25

(d) None of these

8. The discriminant of the quadratic equation $x^2 - 7x + 12 = 0$ is :

(a) 49

(b) 84

(c) 1

(d) None of these

9. The sum of first 100 positive integers is :

(a) 5050

(b) 5001

(c) 5005

(d) None of these

10. A card is drawn from a pack of 52 cards. The probability of drawing a red ace card is :

(a) $\frac{2}{26}$

(b) $\frac{1}{26}$

(c) $\frac{3}{26}$

(d) None of these

11. Two triangles are similar if their corresponding angles are equal.

(True / False)

12. A line intersecting a circle in two points is called a _____.

13. Define angle of elevation.

Or

The value of $\cos \theta$ decreases as θ increases.

(True / False)

14. The exponent of 2 in the prime factorisation of 144 is :

(a) 8

(b) 4

(c) 2

(d) None of these

15. The pair of equations $y = 0$ and $y = -7$ has :
- (a) unique solution (b) no solution
- (c) infinitely many solutions (d) None of these
16. Let R and r be the external and internal radii of a hollow cylinder of height h , then volume of material is :
- (a) $2\pi (R + h) (R - h)$ (b) $\pi (R^2 - r^2)$
- (c) $\pi (R^2 - r^2)h$ (d) None of these
17. The 7th term of an A.P. is 13 and the 13th term is 25.
What is the common difference?
- (a) 1 (b) 3
- (c) 2 (d) None of these

18. The mean of the data 10, 20, 30, 40, 50 is :

(a) 20

(b) 30

(c) 35

(d) None of these.

19. The sum of the probabilities of all the elementary events of an experiment is :

(a) 0

(b) 1

(c) 2

(d) None of these

20. Write the formula for mode of grouped data.

Or

The class mark of the class interval 20–40 is _____.

SECTION-B

(2 marks each)

21. Find the zeroes of the quadratic polynomial $6x^2 - 3 - 7x$.
22. Five years hence, the age of Jacob Will be three times that of his son. Five years ago, Jacob's age was seven times that of his son. What are their present ages?
23. Determine if the points (1, 5), (2, 3) and (-2, -11) are collinear.

Or

Find a relation between x and y such that the point (x, y) is equidistant from the points (3, 6) and (-3, 4).

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

25. Given $\sec \theta = \frac{13}{12}$, calculate all other trigonometric ratios.
26. Find the slant height on a cone whose $r = 2.5$ cm and height = 6cm.

Or

2 cubes each of volume 64cm^3 are joined end to end. Find the surface area of the resulting cuboid.

SECTION-C

(3 marks each)

27. A chord of circle of radius 12cm subtend an angle of 120° at the centre. Find the area of the corresponding segment of the circle.

(use $\pi = 3.14$ and $\sqrt{3} = 1.73$)

28. Find the ratio in which the line segment joining the points $(-3, 10)$ and $(6, -8)$ is divided by $(-1, 6)$.
29. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

Or

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

30. If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio. Prove it.

31. A bag contains 3 red 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
32. If the sum of first 7 terms of an A.P. is 49 and that of 17 terms is 289. Find the sum of first n terms.

Or

Find the 20th term from the last term of the A.P. : 3, 8, 13, ... , 253.

33. Prove that $\sqrt{5}$ is irrational.
34. S and T are points on the sides PQ and PR respectively of a ΔPQR . If $\frac{PS}{SQ} = \frac{PT}{TR}$ and $\angle PST = \angle PRQ$. Prove that PQR is an isosceles triangle.

SECTION-D

(4 marks each)

35. Find two consecutive positive integers, sum of whose Squares is 365.

Or

Find the nature of the roots of the quadratic equation $2x^2 - 6x + 3 = 0$. If the real roots exist, find them.

36. E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that $\triangle ABE \sim \triangle CFB$.

Or

A vertical pole of length 6m casts a shadow 4m long on the ground and at the same time a tower casts a shadow 28m long. Find the height of the tower.

37. Express the trigonometric ratios $\sin A$, $\sec A$ and $\tan A$ in terms of $\cot A$.

Or

Prove the identity, where the angle involved is an acute angle

$$\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$$

38. A Tower stands vertically on the ground. From a point on the ground, which is 15m 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.
39. A cubical block of side 7cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

Or

A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2cm and the diameter of the base is 4cm. Find the volume of the toy.

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