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Total No. of Questions : 40]

[Total No. of Printed Pages : 10

10th AROKD(W/Z) JKLUT-2026

2003-C MATHEMATICS

Time : 3 Hours]

[Maximum Marks : 80

Note :- This question paper comprises of four sections — A, B, C and D.
All questions are compulsory.

Section-A

(1 mark each)

1. 3 is :

(a) an even number

(b) a perfect number

☒ (c) a prime number

(d) None of these

2. The product of zeroes of the polynomial $x^2 - 3$ is :

☒ (a) 3

☒ (b) -3

(c) 1

(d) None of these

3. The pair of linear equations $y = 2x - 2$ and $y = 4x - 4$ are :

- (a) Coincident (b) Parallel
(c) Intersecting (d) None of these

4. $\sec^2 A$ is equal to :

- (a) $1 + \cot^2 A$ (b) $1 + \tan^2 A$
(c) $1 - \tan^2 A$ (d) None of these

5. The common difference of the A.P. :

$\frac{3}{2}, \frac{1}{2}, \frac{-1}{2}, \frac{-3}{2}$ is

- (a) -1 (b) 0
(c) 1 (d) None of these

6. Regarding the point $(-4, 6)$, 6 is called

- (a) Abscissa (b) Ordinate
(c) Origin (d) None of these

7. L.C.M. of 6, 72, 120 is :

- (a) 6 (b) 198
(c) 360 (d) None of these

8. Probability of an impossible event is :
- (a) ~~0~~ (b) 1
(c) 2 (d) None of these
9. Curved surface Area of cone is :
- (a) $\frac{1}{3} \pi r h$ (b) $\frac{1}{3} \pi r^2 h$
(c) $\frac{1}{3} \pi r l$ (d) ~~None of these~~
10. A Quadratic equation $ax^2 + bx + c = 0$ has equal roots, if
- (a) $b^2 - 4ac > 0$ (b) $b^2 - 4ac < 0$
(c) ~~$b^2 - 4ac = 0$~~ (d) None of these
11. $\sqrt{2}$ is a rational number. (True/False)
12. The 10th term of the A.P. 10, 7, 4 is :
- (a) 17 (b) ~~-17~~
(c) 37 (d) None of these
13. $\frac{1}{6}$ can be the probability of an event. (True/False)

14. If the two triangles PQR and DEF are similar then

(a) $\Delta PQR \sim \Delta FED$

(b) $\Delta PQR \sim \Delta EFD$

(c) $\Delta PQR \sim \Delta EFD$

~~(d)~~ None of these

15. A line meeting a circle in one point is called a tangent to the circle.

16. The sum of the first 'n' terms of an A.P. Whose first term is a and common difference d is $Sn = n/2 [2a + (n-1)d]$

17. If a pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, are inconsistent if $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$. (True/False)

18. $\sin 60^\circ = \frac{2}{\sqrt{3}}$. (True/False)

Or

$\tan (90^\circ - \theta) = \dots\dots\dots$

Handwritten notes:
 $\frac{\sin \theta}{\cos \theta} = \tan \theta$
 $\frac{\cos \theta}{\sin \theta} = \cot \theta$
 $\frac{1}{\sin \theta} = \csc \theta$
 $\frac{1}{\cos \theta} = \sec \theta$

19. Write the formula for the class mark in a class interval. $\frac{UP + LP}{2}$

20. Find the mid-point of the class interval (55-70).

62.5

Section-B

(2 marks each)

21. Solve the following equations by substitution method:

$$x + y = 14 \text{ and } x - y = 4.$$

22. Find the nature of the roots of the quadratic equation $2x^2 - 3x + 5 = 0$.

23. If $15 \cot A = 8$, find $\sin A$ and $\sec A$.

24. Find the curved surface area of a cone of radius 2.5 cm and slant height 6.5 cm. (Use $\pi = 3.14$).

Or

Find the slant height of a cone of radius 2.5 cm and height 6 cm.

25. Find the coordinates of the point which divides the join of $(-1, 7)$ and $(4, -3)$ in the ratio $2 : 3$.

Or

Find the point on the x-axis which is equidistant from $(2, -5)$ and $(-2, 9)$.

$$\begin{aligned} A(2, -5) \\ B(-2, 9) \\ C(x, y) \end{aligned}$$

26. Find a quadratic polynomial, the sum and product of its zeroes are $\frac{1}{4}$ and -1 respectively.

Turn Over

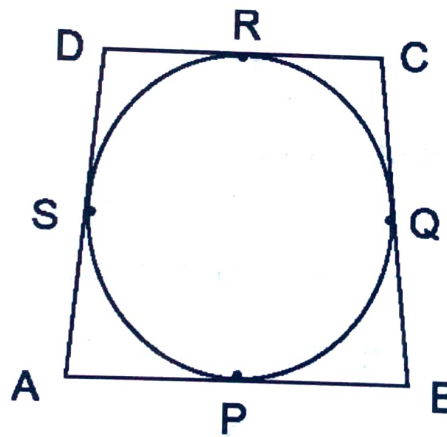
Section-C

(3 marks each)

27. Find the area of a rhombus if its vertices are $(3, 0)$, $(4, 5)$, $(-1, 4)$ and $(-2, -1)$ taken in order.
28. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding major sector. (Use $\pi = 3.14$).
29. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$

$$\begin{matrix} x_1 & y_1 \\ B(4, 5) \\ D(-2, -1) \\ x_2 & y_2 \end{matrix}$$

$$\begin{matrix} A(3, 0) \\ x_1 & y_1 \\ C(-1, 4) \\ x_2 & y_2 \end{matrix}$$



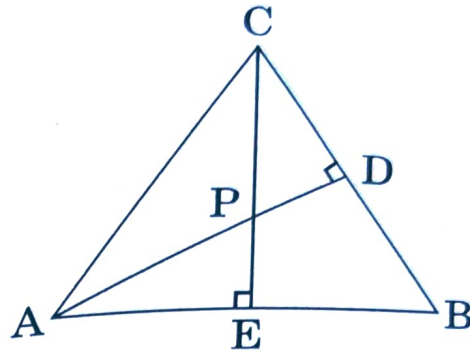
Or

Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre.

30. In given figure Altitudes AD and CE of $\triangle ABC$ intersect each other at the point 'P' inside the triangle. Show that:

(i) $\triangle ABD \sim \triangle CBE$

(ii) $\triangle AEP \sim \triangle ADB$



31. If a line divides any two sides of a triangle in the same ratio, then the line is parallel to the third side. Prove it.

32. Prove that $7\sqrt{5}$ is irrational.

33. Find the 20th term from the last term of the AP : 3, 8, 13 ... 253.

Or

Find the sum of first 51 terms of an A.P. whose second and third terms are 14 and 18 respectively.

34. A die is thrown once. Find the probability of getting

- (i) a number lying between 2 and 6
(ii) a prime number

Section-D

(4 marks each)

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

Or

Is it possible to design a rectangular Park of perimeter 80 m and area 400 m^2 ? If so, find its length and breadth.

36. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter, the diameter of the spherical part is 8.5 cm. Find the volume of water it can hold. (Use $\pi = 3.14$).

Or

A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel. (Use $\pi = \frac{22}{7}$)

37. A 1.5 m tall boy is standing at some distance from a 30 m tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Find the distance he walked towards the building.

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38. Prove the identity, where θ is an acute angle.

$$(\operatorname{Cosec} \theta - \cot \theta)^2 = \frac{1 - \cos \theta}{1 + \cos \theta}$$

Or

Find the Trigonometric ratios of 45° angle.

39. Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of ΔPQR . Show that $\Delta ABC \sim \Delta PQR$.

Or

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

40. A student noted the number of cars passing a spot on a road for 100 periods each of 3 minutes and summarised in the table below. Find the mode of the data:

No. of Cars	Frequency
0-10	7
10-20	14
20-30	13
30-40	12
40-50	20
50-60	11
60-70	15
70-80	8
