Moulana Azad Model School

Shikaripalya

MODEL TEST PAPER 4

Class 10 - Mathematics

Time Allowed: 3 hours and 15 minutes

Maximum Marks: 80

i) Multiple Choice Questions

1. The graph of y = p(x) is given, for a polynomial p(x). The number of zeroes of p(x) from the graph is [1]



c) 2

3.



[1]

2.	For the following frequency distribution:
	a contraction of the second

Class:	0-5	5-10	10-15	15-20	20-25		
Frequency:	8	10	19	25	8		
The upper limit of the median class is:							
a) 15		b) 2	10				
c) 20		d) 2	25				
The radii of the base of a cylinder and a cone are in the ratio 3 :4. If they have their heights in the ratio 2 : 3, the [1]							
ratio between their volumes is							
a) 9:8		b) 3	3:4				
		_					

- c) 8 : 9 d) 4 : 3
- 4. If the HCF of 72 and 234 is 18, then the LCM (72, 234) is:
 - a) 936 b) 836
 - c) 234 d) 324

5. If PA and PB are tangents to the circle with centre O such that $\angle APB = 40^\circ$, then $\angle OAB$ is equal to [1]



a) 40°	b) 30°
c) 20°	d) 25°

6. In the given figure if BP||CF, DP||EF, then AD : DE is equal to

[1]

[1]



ii) Answers the following questions

- 9. Express 3825 as product of its prime factors.
- 10. For what value of k, the system of equations 2x ky + 3 = 0, 4x + 6y 5 = 0 is consistent? [1]
- In each of the given pairs of triangle, find which pair of triangles are similar. State the similarity criterion and [1] write the similarity relation in symbolic form.



Check whether $(x + 1)^2 = 2(x - 3)$ is a quadratic equation. [1] 12. If $x = \frac{-1}{2}$ is a solution of the quadratic equation $3x^2 + 2kx + 3 = 0$, find the value of k. [1] 13. Find the coordinates of the point A, where AB is a diameter of the circle with centre (-2, 2) and B is the point 14. [1] with coordinates (3, 4). The sum of the zeros and the product of zeros of a quadratic polynomial are $\frac{-1}{2}$ and -3 respectively. Write the 15. [1] polynomial. 16. Write the expression for the total surface area of a solid hemisphere of radius **r**. [1] iii) Answers the following questions 17. Find the HCF of 96 and 404 by prime factorisation method. Hence, find their LCM. [2] OR Prove that 7 + $4\sqrt{5}$ is an irrational number, given that $\sqrt{5}$ is an irrational number.

18. In Fig. DE ||BC such that $AE = (\frac{1}{4}) AC$. If AB = 6 cm, find AD.

[2]

[1]



19.	Solve for x and y: $x + y = 6$, $2x - 3y = 4$	[2]
20.	Find the 30th term of the AP: 10, 7, 4,	[2]
21.	If the equation $mx^2 + 2x + m = 0$ has two equal roots, then find the values of m.	[2]
	OR	
	Check whether $(x - 2)^2 + 1 = 2x - 3$ is a quadratic equation.	
22.	In \triangle ABC, right-angled at B, AB = 5 cm and \angle ACB = 30°. Determine the lengths of sides BC and AC.	[2]
	Α	



- A piggy bank contains hundred 50 paisa coins, fifty ₹1 coins, twenty ₹2 coins, and ten ₹5 coins. If it is equally [2] likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin will not be a ₹5 coins?
- 24. A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding: [2]i. minor segment
 - ii. major sector.

iv) Answers the following questions

25. If α , β are the zeros of the polynomial $2x^2 - 4x + 5$. find the value of (i) $\alpha^2 + \beta^2$ (ii) $(\alpha - \beta)^2$. [3] OR

One zero of the polynomial x^2 - 2x - (7p + 3) is -1, find the value of p and the other zero.

26. Prove the trigonometric identity: $\frac{\cos\theta \csc\theta - \sin\theta \sec\theta}{\cos\theta + \sin\theta} = \csc\theta - \sec\theta$ [3] OR

If sin (A+B)=1 and cos (A-B) = $\frac{\sqrt{3}}{2}$, $0^{\circ} < A + B \le 90^{\circ}$, A > B then find A and B. Find the mode of the following distribution:

27. Find the mode of the following distribution:

Class Interval Frequency 5 0 - 10 10 - 20 8 7 20 - 30 12 30 - 40 28 40 - 50 50 - 60 20 60 - 70 10 70 - 80 10

[3]

The percentage of marks obtained by 100 students in an examination are given below:

Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65
Frequency	14	16	18	23	18	8	3

Determine the median percentage of marks.

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

OR

The line segment joining the points A(3, - 4) and B(1, 2) is trisected at the points P and Q. Find the coordinates of P.

- 29. A point P is 13 cm from the centre of the circle. The length of the tangent drawn from P to the circle is 12 cm. [3]Find the radius of the circle.
- 30. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes. [3]

OR

A calf is tied with a rope of length 6 m at the corner of a square grassy lawn of side 20 m. If the length of the rope is increased by 5.5 m, find the increase in area of the grassy lawn in which the calf can graze.

- 31. If the price of a book is reduced by ₹ 5, a person can buy 4 more books for ₹ 600. Find the original price of the [3] book.
- 32. In Fig. considering triangles BEP and CPD, prove that $BP \times PD = EP \times PC$.



33. Two years ago, Salim was thrice as old as his daughter and six years later, he will be four years older than twice [3] her age. How old are they now?

v) Answers the following questions

34. In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and other potatoes are **[4]** placed 3 m apart in a straight line. There are n potatoes in the line (See Fig.).



A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?

[**Hint:** To pick up the first potato and the second potato, the total distance (in metres) run by a competitor is $2 \times 5 + 2 \times (5 + 3)$]

OR

The last term of an arithmetic progression consisting of 12 terms is 37. If the sum of the two middle terms of the progression is 41, then find the arithmetic progression and also the sum of the terms of the arithmetic progression.

- 35. Find the solution of the given pair of linear equations by graphical method. x + y= 5, 2x + y = 7
- 36. In the given figure, if $\angle A = \angle C$, AB = 6cm, BP = 15 cm, AP = 12cm and CP = 4, then find the lengths of PD [4] and CD.

[4]

[3]

[3]

B P D

37. The angle of elevation of the top of an unfinished tower at a distance of 75m from its base is 30° . How much [4] higher must the tower be raised so that the angle of elevation of its top at the same point may be 60° ? [Take $\sqrt{3}$ = 1.732.]

Vi) Answer the following question

38. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder as shown in the [5] figure. If the height of the cylinder is 10 cm and its base is of radius 3.5 cm, find the total surface area of the article.

