Moulana Azad Model School

Shikaripalya

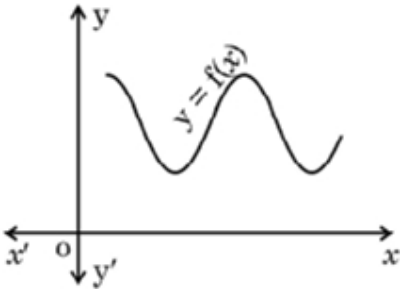
MODEL TEST PAPER - 5

Class 10 - Mathematics

Time Allowed: 3 hours **Maximum Marks: 80**

i) Multiple Choice Questions

1. The graph of y = f(x) is shown in the figure for some polynomial f(x). **[1]**



The number of zeroes of f(x) is

a) 3 b) 4

c) 0 d) 2

2. For the following frequency distribution: **[1]**

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) 10

c) 20 d) 25

3. The shape of a gilli in the gilli-danda game is a combination of **[1]**

a) two cylinders b) a cone and a cylinder

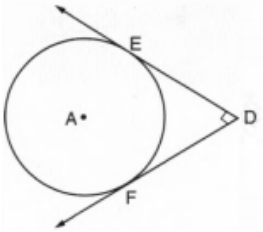
c) two cylinders and a cone d) two cones and a cylinder

4. Which of the following is a pair of co-primes? **[1]**

a) (14, 35) b) (18, 25)

c) (32, 62) d) (31, 93)

5. In Figure, DE and DF are tangents from an external point D to a circle with centre A. If DE = 5 cm and DE ⊥ DF, then the radius of the circle is **[1]**



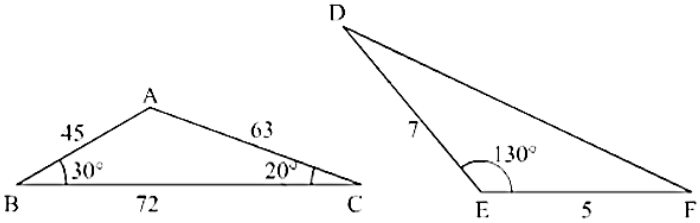
a) 6 cm

b) 4 cm

c) 5 cm

d) 3 cm

6. In the given figures the measures of ∠D and ∠F are respectively **[1]**



a) 20^o, 30^o.

b) 30^o, 20^o.

c) 50^o, 40^o.

d) 40^o, 50^o.

7. The graphs of the equations 5x - 15y = 8 and 3x - 9y = $\frac{24}{5}$ are two lines which are **[1]**

a) intersecting exactly at one point

b) coincident

c) perpendicular to each other

d) parallel

8. The distance of the point (4, 7) from the y-axis is **[1]**

a) 11

b) 4

c) $\sqrt{65}$

d) 7

ii) Answers the following questions

9. Express 360 as product of its prime factors. **[1]**

10. Write whether the following pair of linear equations is consistent or not. **[1]**

x + y = 14

x - y = 4

11. In a △ABC, if DE is parallel to BC, $\frac{AD}{DB} = \frac{4}{5}$ and AC = 15 cm, then find the length of AE. **[1]**

12. Find the nature of the roots of the quadratic equation $4x^2$ - 5x + 3 = 0. **[1]**

13. Check whether it is a quadratic equation: **[1]**

(2x - 1)(x - 3) = (x + 4)(x - 2)

14. If P (x, 6) is the mid-point of the line segment joining A (6,5) and B (4, y), find y. **[1]**

15. Find a quadratic polynomial whose zeroes are 3 and -5. **[1]**

16. Two cubes each of side 4 cm are joined end to end. Find the surface area of the resulting cuboid. **[1]**

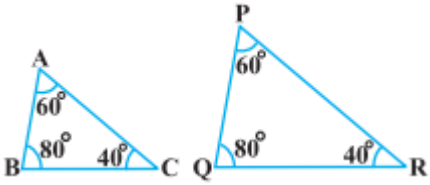
iii) Answers the following questions

17. Find the HCF and LCM of 108, 120 and 252 using prime factorisation method. **[2]**

OR

Prove that $5 - \sqrt{3}$ is an irrational number.

18. State the pair of triangles in the the below fig, are similar. Write the similarity criterion used by you for answering the question and also write the pair of similar triangles in the symbolic form: **[2]**



19. Find the solution for the given pair of linear equations : **[2]**

x + y = 10, 2x – y = 8

20. Is 200 any term of the sequence 3, 7, 11, 15, …? **[2]**

21. For what value of k, the roots of the quadratic equation $kx(x - 2\sqrt{5}) + 10 = 0$ real and equal? **[2]**

OR

Find the ratio of the sum and product of the roots of $7x^2 - 12x + 18 = 0$.

22. If 3 cot A = 4, find the value of $\frac{cosec^2 A+1}{cosec^2 A-1}$. **[2]**

23. A bag contains lemon-flavoured candies only. Hema takes out one candy without looking into the bag. What is the probability that she takes out **[2]**

i. an orange-flavoured candy?

ii. a lemon-flavoured candy?

24. Find the area of a quadrant of a circle , whose circumference is 22 cm . **[2]**

iv) Answers the following questions

25. If α, β are the zeroes of the $x^2 + 7x + 7$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta} - 2\alpha\beta$. **[3]**

OR

Find the zeros of $f(x) = x^2 - 2x - 8$ and verify the relationship between the zeros and its coefficients.

26. In $\triangle$ABC, right-angled at B, AB = 5 cm and BC = 12 cm. Find the values of sin A, sec A, sin C and sec C. **[3]**

OR

Evaluate: $4\left(\sin^4 30^\circ + \cos^2 60^\circ\right) - 3\left(\cos^2 45^\circ - \sin^2 90^\circ\right) - \sin^2 60^\circ$

27. Find the mode of the following frequency distribution. **[3]**

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	8	10	10	16	12	6	7

OR

Find the mean, median and mode of the following data:

Classes:	0 - 50	50 - 100	100 - 150	150 - 200	200 - 250	250 - 300	300 - 350
Frequency:	2	3	5	6	5	3	1

28. Find the mid-point of side BC of $\triangle$ABC, with A(1, - 4) and the mid-points of the sides through A being (2, -1) and (0, -1). **[3]**

OR

If the points P, Q(x, 7), R, S(6, y) in this order divide the line segment joining A(2, p) and B (7, 10) in 5 equal parts, find x, y and p.

29. Prove that the tangent drawn at the midpoint of an arc of a circle is parallel to the chord joining the end points of the arc. **[3]**

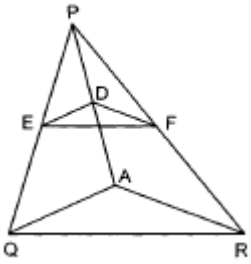
30. A sector of 56°, cut out from a circle, contains 17.6 cm^2. Find the radius of the circle. **[3]**

OR

A chord of a circle of radius 15 cm subtends an angle of 60^o at the center. Find the areas of the corresponding minor and major segments of the circle. (Use π = 3.14 and $\sqrt{3}$ = 1.73)

31. A passenger train takes one hour less for a journey of 150 km if its speed is increased by 5 km/hr from its usual speed. Find the usual speed of the train. **[3]**

32. In Fig. if $DE||AQ$ and $DF||AR$. Prove that $EF||QR$. **[3]**



33. On selling a tea-set at 5% loss and a lemon-set at 15% gain, a crockery seller gains, a crockery seller gains ₹7. If he sells the tea-set at 5% gain and the lemon-set at 10% gain, he gain ₹13. Find the actual price of the tea-set and the lemon-set. **[3]**

v) Answers the following questions

34. The sum of the 4^{th} and 8^{th} term of an A.P. is 24 and the sum of the 6^{th} and 10^{th} term of the A.P. is 44. Find the A.P. Also, find the sum of first 25 terms of the A.P. **[4]**

OR

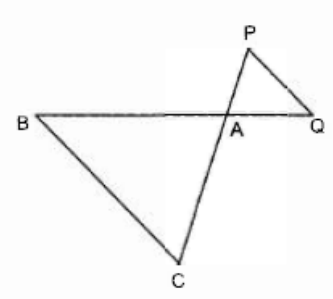
The last term of an arithmetic progression consisting of 12 terms is 37. If the sum of the two middle terms of the progression is 41, then find the arithmetic progression and also the sum of the terms of the arithmetic progression.

35. Solve the system of equation graphically: **[4]**

x- 2y = 5 and 2x+3y = 10

Also, find the points where the lines represented by the given equations intersect the x-axis.

36. In Fig. $\Delta ACB \sim \Delta APQ$. If BC= 10 cm, PQ = 5 cm, BA = 6.5 cm and AP = 2.8 cm, find CA and AQ. Also, find the area (ΔACB): area (ΔAPQ). **[4]**



37. A statue 1.6 m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60^o and from the same point the angle of elevation of the top of the pedestal is 45^o. Find the height of the pedestal. (Use $\sqrt{3}$ = 1.73) **[4]**

Vi) Answer the following question

38. A solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 104 cm and the radius of each of the hemispherical ends is 7 cm, find the cost of polishing its surface at the rate of ₹10 per dm^2. **[5]**