Royal Secondary School - Dhoraji

Sub:- Standard Maths

Std - 10th E.M.

Date :- 16-01-25
Marks :- 80
Time :- 3:00 Hour

Instructions :

(1) This question paper consists 54 question in four section A, B, C & D.

(2) Questions consists general option.

(3) Number indicating on right side of section are marks of the questions.

(4) If required draw the figure.

(5) Write new section from new page. Also write answer in order.

(6) Use of calculater, smart watch or digital watch is prohibited.

(7) Writing should be readable.

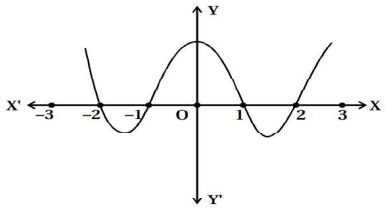
SECTION - A

- **Answer the questions as indicated in instruction : (Question no. 1-24) (Each carries 1 mark)** **[24]**
- **Following question are multiple choice question : (Question no. 1-6) (Each carries 1 mark)**

1. If HCF (65, 117) = 65m-117, then m = ...

A. 4 B. 2 C. 1 D. 3

2. Numbers at zeroes at the graph at p(x) between 0 and 4 are .....



A. 3 B. 6 C. 2 D. 4

3. The pair of linear equation 2x + 3y = 5 and 4x+6y-100 has ..... solutions.

A. infinitely many B. unique C. zero D. none of the given.

4. If $\frac{7}{2}$ is one of the roots of equation $2x^2 - 5x + k = 0$, then k = ...

A. 7 B.-7 C. 4 D. 2

5. For a given AP , $a_{18} - a_{14} = 32$. Then, the common difference of that AP is....

A. 8 B. -8 C. -4 D. 4

6. All the squares are ..... figures.

A. similar B. congruent C. equiareal D. coincidental

- **Fill in the blanks with approprite answes : (Question no. 7-12) (Each carries 1 mark)**

7. One end point of a diameter of a circle is (0, 0) and the centre of the circle is(-2, 4). Then, the other end point of the diameter is.....

8. $\sin^2\theta + \cos^2\theta = ...$

9. ABCD is a cyclic quadrilateral. If $\angle B = 60°$, then $\angle D$= .....

10. The area of a quadrant of a circle with radius 28 cm is ..... cm^2.

11. If the volume of a cube is 1728 cm^3. the length of its edge is..... cm.

12. The mean of first n natural numbers is .....

♦ **State whether the following statements are true or false : (Question no. 13-16) (Each carries 1 mark)**

13. $P(E) + P(\overline{E}) = -1$

14. True or False : 2 is one zero at $p(x) = x^2 - 6x + 8$ polynomial

15. The equation $x^2 - 3x + 5 = 0$ has no real roots.

16. Points (2, 4), (6, 4) and (4, 8) are collinear points.

♦ **Answer the questions in one sentance : (Question no. 17-20) (Each carries 1 mark)**

17. The radius of a circle is 8 cm. Find the area of a square inscribed in the circle.

18. If the mode of the data 16, 15, 17, 16, 15, x, 19, 17, 14 is 15, then find x.

19. State the smallest integer which is exactly divisible by 52 and 117 both.

20. State the nature of roots of the quadratic equation $ax^2 + bx + c = 0$. ($b^2 - 4ac > 0$)

♦ **Match the following with correct alternative : : (Question no. 21-24) (Each carries 1 mark)**

21. What is the graph of linear polynomial ? (a) line

22. What is the graph of quadratic polynomial ? (b) Parabola

(c) Ellipse

	Part-A	Part-B
23.	$\sin 30^\circ$	(a) 1
24.	$\tan 45^\circ$	(b) $\frac{\sqrt{3}}{2}$
		(c) $\frac{1}{2}$

SECTION - B

♦ **Answer any 9 questions out of 13 questions (Question no. 25-37) (Each carries 2 mark)** **[18]**

25. Prove that $\sqrt{5}$ is irrational

26. Solve the pair of equations : $\frac{2}{\sqrt{x}} + \frac{3}{\sqrt{y}} = 2; \frac{4}{\sqrt{x}} - \frac{9}{\sqrt{y}} = -1$

27. Find the roots by factorisation : $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

28. Find the sum of first 20 multiples of 7.

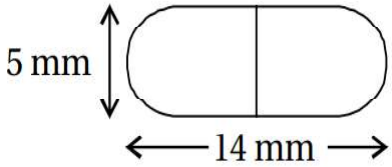
29. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

30. Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$.

31. If $\sin(A-B) = \frac{1}{2}, \cos(A+B) = \frac{1}{2}, 0^o < A+B \le 90^o, A > B$, find A and B.

32. Prove that the parallelogram circumscribing a circle is a rhombus.

33. A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends (see Fig.). The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.



34. The mean of following frequency distribution is 2.6 then find y

x	1	2	3	4	5
f	4	5	y	1	2

35. From the following grouped data find $\frac{n}{2} - cf$.

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	15	13	17	10

36. A die is tossed once. Find the probability of getting (i) an odd number (ii) Greater than 5.

37.

Marks scored	20	25	28	29	33	38	42	43
Frequency	6	20	24	28	15	4	2	1

a) Find the probability of the students getting more than 40 marks.
b) Find the probability of the students getting less than 30 marks.

SECTION - C

♦ **Answer any 6 questions out of 9 questions (Question no. 38-46) (Each carries 3 mark)** **[18]**

38. Obtain the zeroes of $p(x) = x^2 + 9x + 14$. Also find the relation between the zeroes and coefficients.

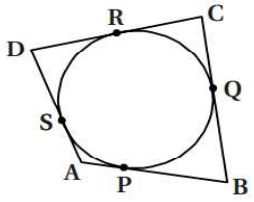
39. If 4 is the zero of the cubic polynomial $p(x) = x^3 - 3x^2 - 6x + 8$ then find the other zeroes of $p(x)$.

40. Under a project of 'one child one tree' undertaken by a school students plants the trees in a pattern of first row three plants, second row 5 plants and third row 7 plants and so on. The last row has 37 plants. Find the number of students in the school

41. Which term of the AP 3, 15, 27, 39, ... will be 132 more than its 54^{th} term.

42. Find a point on the Y-axis which is equidistant from the points P(6, 5) and Q(–4, 3).

43. A quadrilateral ABCD isdrawn to circumscribe a circle (see Figure). Prove that AB + CD = AD + BC



44. AB is a chord of the circle with centre O and radius 13 cm. AB = 24. The tangents drawn at the points A and B intersect each other at the point P. Find AP.

45. A car consists two wipers which doesnot overlap eachother. The length of each, wiper is 25 cm and it cleans the glass blade at 115°. Obtain the area of region cleaned by the wiper.

46. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting

(i) a king of red colour

(ii) a red face card

SECTION - D

♦ **Answer any 5 questions out of 8 questions (Question no. 47-54) (Each carries 4 mark)** **[20]**

47. Form the pair of linear equations for the following problems and find their solution by substitution method. 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 ?

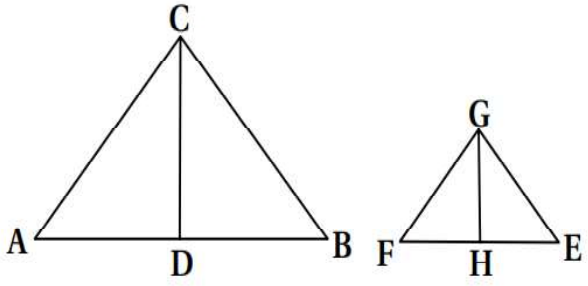
48. The sum of the reciprocal of Rehman's age before 3 years and after 5 years is $\frac{1}{3}$ Find his present age.

49. CD and GH are respectively the bisectors of $\angle$ACB and $\angle EGF$ such that D and H lie on sides AB and FE of ΔABC and ΔEFG respectively . If $\Delta ABC \sim \Delta EGF$, show that :

(i) $\frac{CD}{GH} = \frac{AC}{FG}$

(ii) $\triangle DCB \sim \triangle HGE$

(iii) $\triangle DCA \sim \triangle HGF$

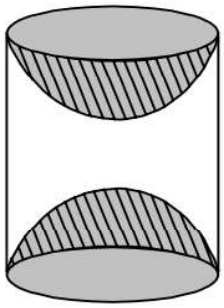


50. In $\triangle PQR, \angle Q = 90^o$ and PM is median. Prove that $PR^2 = PM^2 + 3RM^2$.

51. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 60° respectively. If the bridge is at a height of 3 m from the banks, find the width of the river.

52. 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. By measuring the amount of water it holds, a child finds its volume to be 345 cm^3. Check whether she is correct, taking the above as the inside measurements, and $\pi = 3.14$.

53. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in Fig. 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.



54. A life insurance agent found the following data for distribution of ages of 100 policy holders. Calculate the median age, if policies are given only to persons having age 18 years onwards but less than 60 year.

Age (in your)	Number of policy holders
Below 20	2
Below 25	6
Below 30	24
Below 35	45
Below 40	78
Below 45	89
Below 50	92
Below 55	98
Below 60	100