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SET A



**INDIAN SCHOOL MUSCAT
SECOND PRE BOARD EXAMINATION
MATHEMATICS**

CLASS: X

Sub.Code: 041

Time Allotted: 3 Hrs.

04.02.2020

Max.Marks: 80

General Instructions:

- (i) All questions are compulsory.
- (ii) Questions in section A are MCQ, F.I.B. and very short answer type questions carrying 1 mark each.
- (iii) Questions in section B are short answer type questions carrying 2 marks each.
- (iv) Questions in section C are long answer -I type questions carrying 3 marks each.
- (v) Questions in section D are long answer -II type questions carrying 4 marks each.
- (vi) There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
- (vii) Use of calculators is not permitted.

SECTION A: (Questions 1 – 20 carry 1 mark each)

I. Q1 – Q10 ARE MULTIPLE CHOICE QUESTIONS. WRITE THE ANSWER ALONG WITH THE CORRECT OPTION: **(1 x 10 = 10 marks)**

1. The pair of equations $x + 2y + 5 = 0$ and $-6y - 3x + 1 = 0$ have
(a) infinite number of solutions (b) unique solution (c) no solution (d) one solution
2. The distance of the point A (-2, 3) from y- axis is :
(a) 2 units (b) -2 units (c) 3 units (d) -3 units

3. For the following distribution the modal class is :

Marks	Below 10	Below 20	Below 30	Below 40	Below 50	Below 60
Number of students	3	12	27	57	75	80

- (a) 10-20 (b) 20-30 (c) 30-40 (d) 50-60
4. Find the [HCF x LCM] for the numbers 100 and 190.
(a) 100 (b) 190 (c) 19000 (d) 1900
5. Find the coordinates of the point which divides the line segment joining the points (4, -3) and (8, 5) in the ratio 3:1 internally.
(a) (5, -1) (b) (-1, 5) (c) (7, 3) (d) (3, 7)
6. Given that $\sin \Theta = \frac{\sqrt{3}}{2}$ and $\cos \phi = 0$, then the value of $\phi - \Theta$ is
(a) 0° (b) 30° (c) 60° (d) 90°

7. If $\cos A = 4/5$, then the value of $\tan A$ is
 (a) $3/5$ (b) $3/4$ (c) $4/3$ (d) $5/3$
8. The point which lies on the perpendicular bisector of the line segment joining the points A(-2, -5) and B (2, 5) is _____.
 (a) (0, 0) (b) (-2, 0) (c) (2, 0) (d) (0, 5)
9. If $\sin 3\theta = \cos (\theta - 6^\circ)$ where 3θ and $(\theta - 6^\circ)$ are acute angles, find the value of θ .
 (a) 21° (b) 24° (c) 30° (d) 45°
10. The decimal expansion of $\frac{14587}{1250}$ will terminate after _____ decimal places.
 (a) Five (b) Two (c) Three (d) Four

II. (Q11- Q15) FILL IN THE BLANKS:

(1 x 5 = 5 marks)

11. If the height of a cone is equal to the diameter of its base, the volume of the cone is _____.
12. (i) A quadratic polynomial whose zeroes are -3 and 4 is _____.

OR

(ii) The graph of $y = f(x)$ is given in figure 1, for some polynomial $f(x)$. The number of zeroes of $f(x)$ is _____.

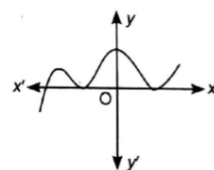


Fig. 1

13. If the areas of two similar triangles are in the ratio 25: 64, the ratio of their corresponding sides will be _____.
14. If the n^{th} term of an A.P. is $(2n+1)$, then its second term is _____.
15. In a family of 3 children, the probability of having at least one boy is _____.

III. (Q16-Q20) ANSWER THE FOLLOWING :

(1 x 5 = 5 marks)

16. In ΔPQR , X and Y are points on sides PQ and PR respectively. If $XY \parallel QR$, $\frac{PQ}{XQ} = \frac{7}{3}$ and $PR = 6.3\text{cm}$, then find YR.

17. (i) In Fig.2, find the perimeter of quadrilateral DEFG .

OR

(ii) Find the length of the tangent drawn to a circle with radius 3 cm, from a point 5 cm away from the centre of the circle.

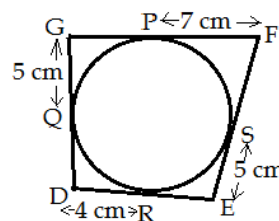


Fig. 2

18. Find the nature of roots for the quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$.
19. If p and q are positive integers such that $p = ab^2$ and $q = a^3b$, where a, b are prime numbers, then find their LCM.
20. Find the number of terms in the A.P. 2, 5, 8, ..., 59 .

SECTION B: (Questions 21 – 26 carry 2 marks each)

21. From a window A in fig.3, 10 m above the ground the angle of elevation of the top C of a tower is x° , where $\tan x^\circ = \frac{5}{2}$ and the angle of depression of the foot D of the tower is y° , where $\tan y^\circ = \frac{1}{4}$. Calculate the height CD of the tower in metres.

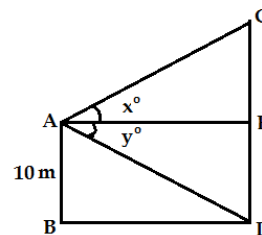


Fig.3

22. (i) Kings and Queens are removed from a deck of cards. A card is drawn at random. Find the probability of drawing a red face card.
- OR**
- (ii) Cards numbered 5 to 50, are placed in a box and mixed thoroughly. A card is drawn from the box at random. Find the probability that the number on the drawn card is a perfect square.
23. Three cubes each of edge 5 cm are joined end to end to form a cuboid. Find the surface area of the resulting cuboid.
24. Two tangents making an angle of 60° between them are drawn to a circle of radius $\sqrt{3}$ cm. Find the length of each tangent.
25. Find the 7th term from the end of the A.P. 7, 10, 13, ..., 184.
26. (i) 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**
- (ii) Two poles of heights 6 m and 11 m stand on a plane ground. If the distance between the feet of the poles is 12 m, find the distance between their tops.

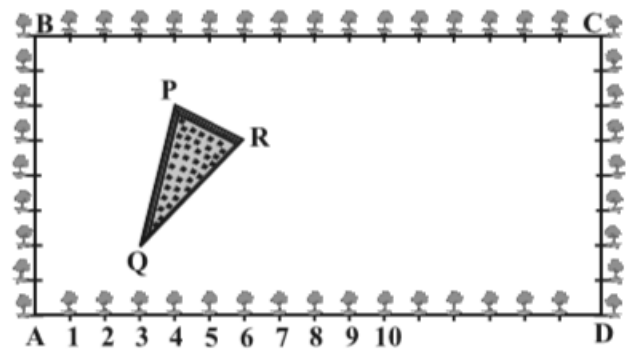
SECTION C: (Questions 27 – 34 carry 3 marks each)

27. (i) Evaluate : $4 \cot^2 45^\circ - \sec^2 60^\circ + \sin^2 60^\circ + \cos^2 90^\circ$
- OR**
- (ii) Find the value of $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \operatorname{cosec}\theta)$.
28. (i) Use Euclid's division algorithm to find the HCF of 4052 and 12576.
- OR**
- (ii) Use Euclid's Division lemma to show that the square of any positive integer is of the form $3m$ or $3m + 1$, for some integer m .
29. The mean of the following frequency distribution is 62.8. Find the missing frequency **p**.

Class	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	5	8	p	12	7	8

30. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre.
Find: (a) the length of the arc (b) area of the sector formed by the arc
31. Find all the zeroes of the polynomial $3x^4 + 6x^3 - 2x^2 - 10x - 5$ if two of its zeroes are $\sqrt{\frac{5}{3}}$ and $-\sqrt{\frac{5}{3}}$.
32. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first 10 terms.

33. The class X students of a secondary school in Krishinagar have been allotted a rectangular plot of land for their gardening activity. Saplings of Gulmohar are planted on the boundary at a distance of 1m from each other. There is a triangular grassy lawn in the plot as shown in the figure. The students are to sow seeds of flowering plants on the remaining area of the plot. What will be the coordinates of the vertices of ΔPQR if A is the origin? Also calculate the area of the triangle.



34. (i) Find the values of 'a' and 'b' for which the following system of linear equations has infinite number of solution: $2x+3y=7$
 $(a+b+1)x + (a+2b+2)y = 4(a+b)+1$

OR

- (ii) The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. Find the present ages, in years, of the son and the father .

SECTION D: (Questions 35 – 40 carry 4 marks each)

35. During the medical check-up of 35 students of a class their weights were recorded as follows :

Weight (in kg)	38 - 40	40- 42	42- 44	44- 46	46- 48	48-50	50-52
No. of students	3	2	4	5	14	4	3

Draw a less than type and a more than type ogive from the given data. Hence obtain the median weight from the graph.

36. (i) Draw a triangle ABC with side $BC = 6$ cm, $AB = 5$ cm and $\angle ABC = 60^\circ$. Then construct a triangle whose sides are $\frac{4}{3}$ of the corresponding sides of the ΔABC .

OR

- (ii) Draw a pair of tangents to a circle of radius 4 cm which are inclined to each other at an angle of 60° .

37. (i) A cone is divided into two parts by drawing a plane through a point which divides its height in the ratio 1 : 2 starting from the vertex and the plane is parallel to the base. Compare the volume of the two parts.

OR

- (ii) A well of diameter 2 m is dug 14 m deep. The earth taken out of it is spread evenly all around it to a width of 5 m to form an embankment. Find the height of the embankment.

38. Prove that ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

39. A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60° . After some time, the angle of elevation reduces to 30° . Find the distance travelled by the balloon during the interval.

40. (i) A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.

OR

- (ii) The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

End Of The Question Paper