Roll Number		

SET **B**

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. 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

2. Given that $\sin \Theta = \frac{\sqrt{3}}{2}$ and $\cos \phi = 0$, then the value of $\phi - \Theta$ is
(a) 0^o (b) 30^o (c) 60^o (d) 90^o

3. 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)

4. If $\sin 3\Theta = \cos (\Theta - 6^0)$ where 3Θ and $(\Theta - 6^0)$ are acute angles, find the value of Θ.
(a) 21^0 (b) 24^0 (c) 30^0 (d) 45^0

5. If cos A = 4/5, then the value of tan A is
(a) 3/5 (b) 3/4 (c) 4/3 (d) 5/3

6. Find the [HCF x LCM] for the numbers 100 and 190.
(a) 100 (b) 190 (c) 19000 (d) 1900

7. 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)

8. 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

9. The decimal expansion of $\frac{14587}{1250}$ will terminate after _____ decimal places.
(a) Five (b) Two (c)Three (d) Four

10. The distance of the point A (-2, 3) from y- axis is :
(a) 2 units (b) -2 units (c) 3 units (d) -3 units

II. <u>(Q11- Q15) FILL IN THE BLANKS</u>: (1 x 5 = 5 marks)

11. If the areas of two similar triangles are in the ratio 25: 64, the ratio of their corresponding sides will be _____.

12. In a family of 3 children, the probability of having at least one boy is_____.

13. If the n^{th} term of an A.P. is (2n+1), then its second term is _____.

14. If the height of a cone is equal to the diameter of its base, the volume of the cone is _____.

15. (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 ____.

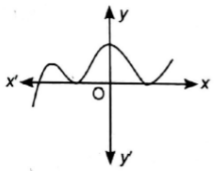


Fig. 1

III. <u>(Q16-Q20) ANSWER THE FOLLOWING</u> : (1 x 5 = 5 marks)

16. Find the number of terms in the A.P. 2, 5, 8, …, 59 .

17. 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.

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

19. Find the nature of roots for the quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$.

20. (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.

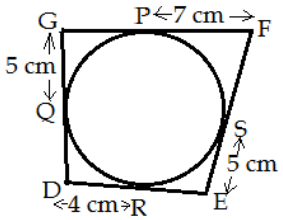


Fig. 2

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

21. (i) E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that ΔABE ~ Δ 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.

22. Two tangents making an angle of 60^0 between them are drawn to a circle of radius $\sqrt{3}$ cm. Find the length of each tangent.

23. Find the 11th term from the last term of the AP 10, 7, 4,…….,-62

24. (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.

25. Three cubes each of edge 10 cm are joined end to end to form a cuboid. Find the surface area of the resulting cuboid.

26. 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 $\tan x^0 = \frac{5}{2}$ and the angle of depression of the foot D of the tower is y°, where $\tan y^0 = \frac{1}{4}$. Calculate the height CD of the tower in metres.

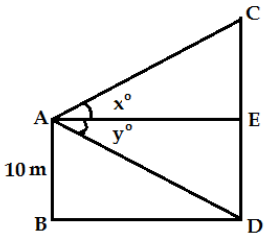


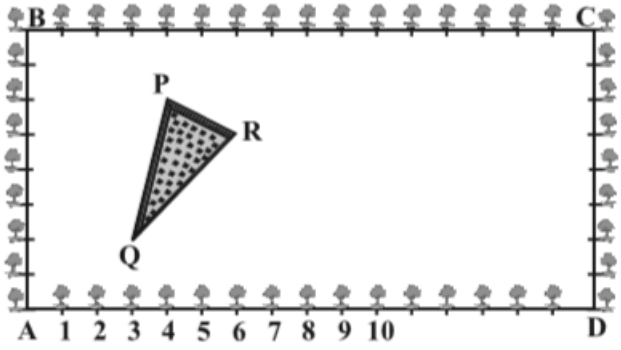
Fig.3

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

27. 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

28. 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.



29. (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 .

30. A chord of a circle of radius 10cm subtends a right angle at the centre.
Find: (a) the length of the arc (b) area of the sector formed by the arc (Use $\pi = 3.14$)

31. 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.

32. (i) Evaluate : $4\cot^2 45^0 - \sec^2 60^0 + \sin^2 60^0 + \cos^2 90^0$

OR

(ii) Find the value of $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \operatorname{cosec}\theta)$.

33. 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 $-\sqrt{\frac{5}{3}}$.

34. (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.

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

35. (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 place 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 from an embankment. Find the height of the embankment.

36. (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.

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

38. 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.

39. From the top of a building 60m high, the angles of depression of the top and bottom of a vertical lamp post are observed to be 30° and 60° respectively.
Find: (i) the horizontal distance between the building and the lamp post (ii) The height of the lamp post.
[Use $\sqrt{3}= 1.732$]

40. (i) Draw a triangle ABC with side BC = 6 cm, AB = 5 cm and $\angle ABC = 60^0$. Then construct a triangle whose sides are 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°.

End Of The Question Paper