



INDIAN SCHOOL SOHAR
PRE-BOARD EXAMINATION (2019-20)
MATHEMATICS - BASIC

CLASS: X

MAX. MARKS: 80

DATE: 25/01 /2020

DURATION: 3 HRS

General Instructions:

1. All questions are compulsory
2. The question paper consists of 40 questions divided into 4 sections A, B, C and D.
3. Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
4. 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 four marks each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculators is not permitted.

SECTION A

(Q.1 – Q.10) are multiple choice questions. Select the appropriate answer from the given options.

1. The decimal expansion of π is:

(a) terminating	(b) non-terminating and non-recurring
(c) non-terminating and recurring	(d) 17.32

2.

Classes	0 - 10	10 – 20	20 - 30	30 - 40	40 - 50
Frequency	15	10	5	23	8

The modal class of the distribution is:

- | | | | |
|-------------|-------------|-------------|-------------|
| (a) 10 – 20 | (b) 20 – 30 | (c) 30 – 40 | (d) 40 - 50 |
|-------------|-------------|-------------|-------------|
3. Rational number $\frac{p}{q}$, $q \neq 0$ will be terminating decimal if the prime factorisation of q is of the form. (m and n are non - negative integers)

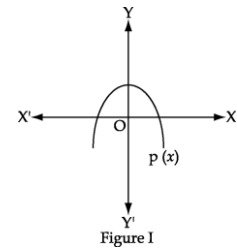
(a) $2^m \times 3^n$	(b) $2^m \times 5^n$	(c) $3^m \times 5^n$	(d) $7^m \times 5^n$
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 4. From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. The radius of the circle is :

(a) 7cm	(b) 12cm	(c) 15cm	(d) 24.5cm
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 5. In tossing a die, the probability of getting a number less than 4 is :

(a) 0	(b) 1	(c) $\frac{1}{2}$	(d) $\frac{2}{3}$
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 6. The product of the zeroes of the polynomial $3x^2 + 3x - 6$ is :

(a) 2	(b) -2	(c) 1	(d) -1
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7. Which of the following is an irrational number?
 (a) 7.12345..... (b) 5.13 (c) $\sqrt{36}$ (d) 0
8. In figure, the graph of a polynomial $p(x)$ is shown, the number of zeroes of $p(x)$ is :



- (a) 0 (b) 3 (c) 2 (d) 1
9. What is the distance between the points (0,4) and (3,0) ?
 (a) 4 (b) 0 (c) 3 (d) 5
10. The mid- point of the line segment joining the points (3,-4) and (-1,2) is :
 (a) (1,-2) (b) (2,-2) (c) (1,-1) (d) (-1,2)

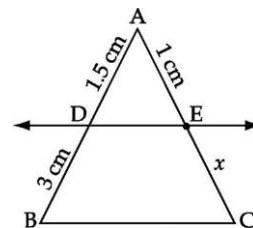
(Q.11 – Q.15) Fill in the blanks

11. If the area of a triangle is 0 square units, then its vertices will be _____
12. The discriminant the equation $2x^2 + 6x + 1 = 0$ is _____

OR

If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ then the lines represented by the equation $a_1x + b_1x + c_1 = 0$ and $a_2x + b_2x + c_2 = 0$ will be _____

13. The value of $\sin 45^\circ \cos 45^\circ \operatorname{cosec} 30^\circ$ is _____
14. $\sin^2 A + \cos^2 A =$ _____
15. In the figure, $DE \parallel BC$, then $x =$ _____



(Q.16 – Q.20) Answer the following

16. ΔABC is right angled isosceles triangle, right angled at C. Find value of $\cos A$

OR

If $\cos \theta = \frac{1}{2}$, find value of $1 + \tan^2 \theta$

17. Find the ratio of the area and circumference of a circle of radius 4 cm.
18. Two unbiased coins are tossed. Find the probability of getting two tails.
19. If the ratio of the corresponding sides of two similar triangles is 3 : 4, then find the ratio of their areas.
20. If the first term of the A.P. is 2 and the common difference is -2, then find a_5

SECTION B

21. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line-segment joining the points of contact at the centre.
22. A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be not green?

OR

A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears a two-digit number

23. A card is drawn from a pack of cards. What is the probability that is red queen?
24. Evaluate $\sin 15^\circ \cos 75^\circ + \cos 15^\circ \sin 75^\circ$

OR

Express $\sin 67^\circ + \cos 75^\circ$ in terms of trigonometric ratios of angles between 0° and 45° .

25. Find the area of a sector of a circle with radius 6 cm if angle of the sector is 70° . $\left(\text{Use } \pi = \frac{22}{7} \right)$
26. Find the quadratic polynomial, the sum and product of whose zeroes are 3 and 2 respectively.

SECTION C

27. Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients.
28. Draw a line segment of length 7.6 cm and divide it in the ratio 5 : 8.

OR

Construct a ΔABC with sides $AB = 5$ cm, $BC = 6$ cm and $CA = 7$ cm, and then another triangle whose sides are $\frac{3}{5}$ of the corresponding sides of ΔABC

29. Prove that the lengths of the tangents drawn from an external point to a circle are equal.
30. Prove that $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

OR

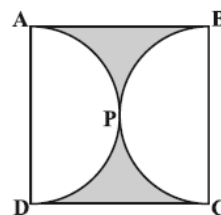
Prove that $(\operatorname{cosec} \theta - \cot \theta)^2 = \frac{1 - \cos \theta}{1 + \cos \theta}$

31. There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?

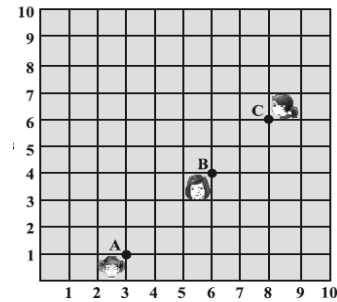
OR

Prove that $2 + \sqrt{5}$ is irrational, given that $\sqrt{5}$ is irrational.

32. Find the area of the shaded region, if ABCD is a square of side 14 cm and APD and BPC are semicircles.



33. Draw the graphs of the equations $x - y = 2$ and $x + y = 2$. Shade the triangular region formed by these lines and the y -axis.
34. The figure shows the arrangement of desks in a classroom. Ashima, Bharti and Camella are seated at A, B and C respectively.
- What are the coordinates of A and B?
 - What is the distance between Ashima and Camella?
 - What is the mid point of the line segment joining A and B?



SECTION D

35. The altitude of a right triangle is 7 cm less than its base. If the hypotenuse is 13 cm, find the other two sides.
36. If the common difference is 5 and the sum of the first nine terms is 72, then find the first term and the tenth term.

OR

How many terms of the AP : 9, 17, 25, . . . must be taken to give a sum of 636 ?

37. The angle of elevation of the top of a building from the foot of the tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 60° . If the tower is 50 m high, find the height of the building.
38. Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

OR

Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

39. A cylindrical bucket, 32 cm high and with radius of base 18 cm, is filled with sand. This bucket is emptied on the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, find the radius and slant height of the heap.

OR

A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent.

40. Change the following frequency distribution to less than type distribution and draw its ogive and using it find its median.

Classes	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25
Frequency f	6	8	10	6	4