Code : 241

PRE BOARD EXAMINATION-2 (JANUARY-2020)

CLASS: X **MATHEMATICS-(BASIC)** **Time: 3 hrs.**

Max mark: 80

General Instructions:

(i) All the questions are compulsory.
(ii) The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
(iii) 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.
(iv) 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.
(v) *Use of calculators is not permitted.*

SECTION A

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

1. The pair of equations $2x + y = 3$, and $3x - y = 5$ have 1
(a) No solution (b) unique solution (c) infinitely many solutions (d) exactly two solutions

2. Which measure of central tendency is given by the x-coordinate of the point of intersection of more than ogive and less than ogive? 1
(a) Mean (b) median (c) mean and mode (d) mode

3. The point which divides the line segment joining the points (8, – 9) and (2, 3) in ratio 1 : 2 internally lies in the 1
(a) I quadrant (b) II quadrant (c) III quadrant (d) IV quadrant

4. The LCM of smallest two digit composite number and the smallest composite number is 1
(a) 20 (b) 4 (c) 44 (d) 12

5. The modal class of the following distribution is 1

Class	0-10	10-20	20-30	30-40	40-50
Frequency	6	10	12	32	20

(a) 10-20 (b) 20-30 (c) 30-40 (d) 40-50

6. If $\Delta ABC \sim \Delta DEF, ar(\Delta DEF) = 900cm^2 and \frac{AB}{DE} = \frac{1}{3}, then\ ar(\Delta ABC) is$ 1
(a) $100cm^2$ (b) $50cm^2$ (c) $200cm^2$ (d) $150cm^2$

7. The decimal representation of $\frac{23}{2^2 5^2}$ will terminate after 1
(a) One decimal places (b) two decimal places (c) three decimal places (d) none of these

8. The distance of the point P (2, 3) from the origin (in units) is 1
(a) $\sqrt{13}$ units (b) 5 units (c) $\sqrt{15}$ units (d) 6 units

9. If A $(\frac{m}{3}, 5)$ is the mid-point of the line segment joining the points Q (– 6, 7) and R (– 2, 3), then the value of m is 1
(a) −12 (b) −4 (c) 12 (d) −6

10. Value of $\sin 30^0 \cos 60^0 + \cos 30^0 \sin 60^0$ is 1
(a) -1 (b) 2 (c) 1 (d) -2

(Q 11- Q 15) Fill in the blanks :

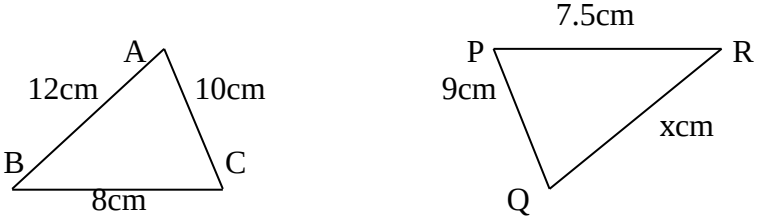
11. In a right circular cone, the cross section made by a plane parallel to the base is a …..…..of a cone. 1

12. If one root of the polynomial $kx^2 - 10x + 1$ is the reciprocal of the other, then the value of k is……. 1

OR

A quadratic polynomial whose sum and product of zeroes are $\sqrt{3}$ and 2 respectively is …….

13. In the given figure, $\Delta ABC \sim \Delta PQR$, then the value of x is 1



14. Fill the two blanks in the sequence 6, ____ , 18, ____ so that the sequence forms an A.P. 1

15. A number is chosen at random from the numbers -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5. Then the probability that square of this number is less than or equal to 1 is…….. 1

(Q 16- Q 20) Answer the following :

16. Represent the following statement in the pair of linear equations in two variables '3 pens and 2 pencils together cost Rs. 34 whereas 2 pens and 3 pencils together cost Rs. 26.' 1

17. State whether the following statement is true or false, 'If A and B are acute angles such that $\sin A = \sin B$, then $A = B$. Justify your answer. 1

18. State whether the following statement is true or false, 'Every quadratic equation has atleast one real root'. Justify your answer. 1

19. Given that HCF(435,725)=145,find LCM(435,725) 1

OR

Write whether $\frac{2\sqrt{45}+3\sqrt{20}}{2\sqrt{5}}$ on simplification is a rational or irrational number.

20. In the figure, PA and PB are tangents such that PA = 11cm and $\angle APB = 60^0$ find the length of the chord AB? 1

OR

The length of a tangent PQ, from an external point P is 24cm. If the distance of the point P from the centre is 25cm, then find the radius of the circle?

SECTION B

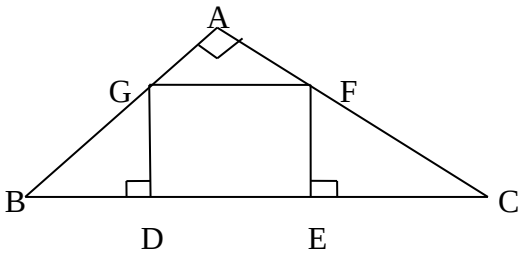
21. Find the sum of first 20 odd natural numbers? 2

OR

Find the 31st term of an AP : 4,8,12,……

22. In the given figure DEFG is a square and$\angle BAC = 90^0$. Prove that 2

(i) $\Delta AGF \sim \Delta DBG$
(ii) $\Delta AGF \sim \Delta EFC$

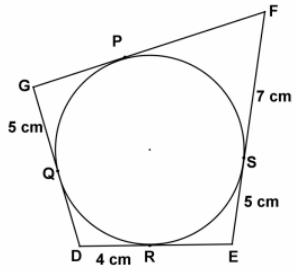


23. Find the mode of the following data: 2

Age(in years)	0-10	10-20	20-30	30-40	40-50	50-60
No of people	6	11	21	23	14	5

24. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting 2
(a) Number '2' of spades
(b) a face card
(c) a red face card
(d) a red and a king

25. Find the perimeter of DEFC 2



26. A vessel in shape of a cuboid is 12 m long and 10 m wide. How high must the vessel be made to hold 480 cubic metre of a liquid ? 2

OR

The slant height of the frustum of a cone is 5 cm. If the difference between the radii of its two circular ends is 4 cm, find the height of the frustum.

SECTION C

27. Find the zeroes of the polynomial and verify the relationship between the coefficients and the zeroes. $f(x) = x^2 + 8x + 15$ 3

OR

Obtain all zeroes of the polynomial $f(x) = x^4 - 3x^3 - x^2 + 9x - 6$ if two of its zeroes are $-\sqrt{3} and\ \sqrt{3}$.

28. Prove that $\sqrt{2}$ is an irrational number. 3

29. If you save Rs.1 today, Rs.2 the next day and Rs.3 the third day and so on, what will be your savings in 100 days? 3

OR

The sum of five consecutive odd integers is 685. What are the numbers?

30. Solve : 3
3x - 2y = 7
y = 14 - 2x

31. Find the value of y if the distance between the points P(4, 2) and Q(1, y) is 5 units. 3

OR

For what value of m, the points (4, 3), (m, 1) and (1, 9) are collinear.

32. Prove that $(\sin\theta + \text{Cosec}\theta)^2 + (\text{Cos}\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$ 3

33. A chord AB of a circle of radius 16 cm makes a right angle at the center of the circle. Find the area of the major and minor segments. (Take π=3.14) 3

34. Evaluate $\frac{tan^2 60^0 + 4sin^2 45^0 + 2sec^2 30^0 + 5cos^2 90^0}{cosec\ 30^0 + \sec 60^0 - cot^2 30^0}$ 3

SECTION D

35. Prove that the ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides. 4

OR

State and prove Pythagoras theorem.

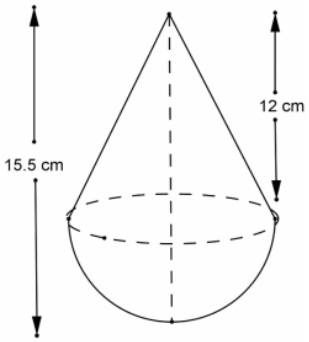
36. Solve using quadratic formula : $\frac{1}{x} - \frac{1}{x-2} = 3,\ x \neq 2,\ x \neq 0$ 4

37. Construct a triangle with sides 4cm, 5cm, and 7cm and then another triangle whose sides are $\frac{3}{5}$ of the corresponding sides of the first triangle. 4

OR

Construct a pair of tangents to a circle of radius 4 cm which are inclined to each other at an angle of 60°

38. 4



A toy is in the form of a cone of radius 3.5 cm is mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

OR

A solid is in the shape of a frustum of a cone. The diameters of the two circular ends are 60 cm and 36 cm and the height is 9 cm. find the area of its whole surface and the volume.

39. As observed from the top of a light house, 100 m above sea level, the angle of depression of a ship, sailing directly towards it, changes from 30° to 45°.Determine the distance travelled by the ship during the period of observation. 4

40. Convert the following into "less than type" distribution and draw its ogive. 4

Scores	Frequency
20-30	8
30-40	10
40-50	14
50-60	12
60-70	4
70-80	2

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