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NAME ……..
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DELHI PUBLIC SCHOOL VINDHYANAGAR

PRE BOARD 1 EXAMINATION (2020-21)

CLASS - X **Max. Marks: 40**

SUBJECT – MATHEMATICS (BASIC) **Time: 2 Hr.**

General Instructions:

1. This question paper contains two parts A and B.
2. Both Part A and Part B have internal choices.

Part – A:

1. It consists of two sections- I and II
2. Section I has 8 questions of 1mark each. Internal choice is provided in 2 questions.
3. Section II has two case study-based questions. Each case study has 5 case-based sub-parts and each sub-part carries1 mark. An examinee is to attempt any 4 out of 5 sub-parts.

Part – B:

1. Question No 11 to 14 are Very short answer Type questions of 2 mark each,
2. Question No 15 to 16 are Short Answer Type questions of 3 marks each
3. Question No 17 to 18 are Long Answer Type questions of 5 marks each.
4. Internal choice is provided in 1 question of 2 marks, 1 question of 3 marks and 1 question of 5 marks.

Part: A

Section-I

1. State the fundamental theorem of Arithmetic.

   OR

   Factorise 140 as a product of its prime factors.

2. Find the zeroes of the polynomial t^2-15.
3. Find out whether the lines represented by the pair of linear equations $5x-4y+8=0$ and $7x+6y-9=0$ intersect at a point, are parallel or coincident.

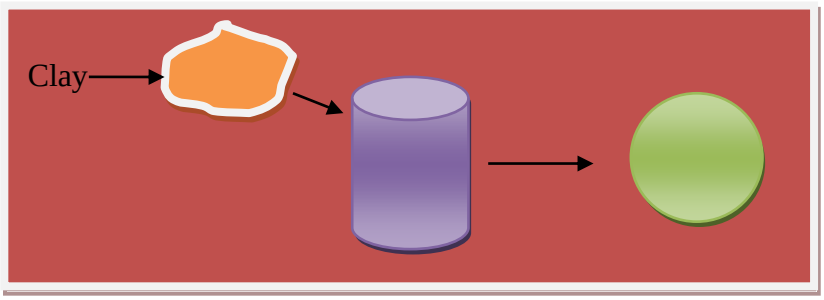
   OR

   Given the linear equation $3x+4y-8=0$, write another linear equation in two variables such that system of both equations has no solution.

4. 11^{th} term of the AP : $\sqrt{2},\sqrt{8},\sqrt{18},\sqrt{32},$- ,-, - is _____
5. If $12\ \text{cosec}\ \theta-13=0$, find the value of $\tan\theta$.
6. The angle of elevation of a ladder leaning against a wall is 60^0 and the foot of the ladder is 9.5m away from the wall. Find the length of the ladder.
7. Find the area of a circle whose circumference is 44cm.
8. If the probability of winning a game is 0.36 then what is the probability of losing it?

Section-II
Case Study based Questions

9. To make the teaching-learning process easier, creative and innovative, a teacher brings clay in the class room to teach the topic mensuration. She forms a cylinder of radius 6cm and height 8cm with the clay, then she moulds the cylinder into a sphere and asks some questions to the students: (use $\pi = 3.14$)



(i) Find the radius of the sphere so formed.

(a) 6cm (b) 7cm (c) 4 cm (d) 8 cm

(ii) Find the volume of the sphere so formed.

(a) $902.32cm^3$ (b) $899.34cm^3$ (c) $904.32cm^3$ (d) $900.32cm^3$

(iii) What is the ratio of the volume of sphere to the volume of cylinder?

(a) 1:2 (b) 2:1 (c) 1:1 (d) 1:3

(iv) Total surface area of the cylinder is:

(a) $525.57cm^2$ (b) $557.55cm^2$ (c) $534.32cm^2$ (d) $527.52cm^2$

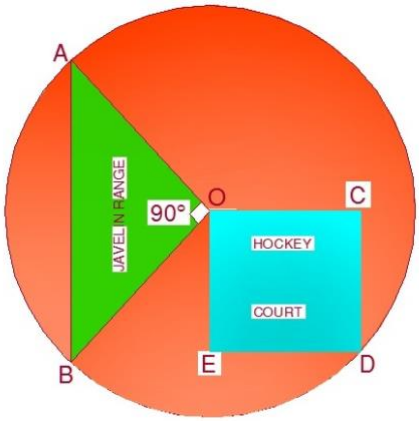
(v) During the conversion of a solid from one shape to another the volume of new shape will:

(a) increase (b) decrease (c) remains unchanged (d) be doubled

OR

To conduct the annual sports competition the junior playground of DPS Vindhyanagar was allotted to the 'Hockey court' and Javelin range as shown in the figure.

The shapes of the Hockey court and the Javelin range are square and triangle respectively. Both of the courts have a common vertex that touches the centre of the ground. The construction of the Javelin range is such that the angle to Javelin is 90^0. The radius of ground is 20m.



(i) The area (in m^2) allotted to Javelin range is:

(a) 200 (b) 300 (c) 400 (d) 500

(ii) The area (in m^2) allotted to the Hockey court is:

(a) 200 (b) 300 (c) 400 (d) 500

(iii) If the management likes to allot space for some more sports, how much area in m^2 is available to them?

(a) 586 (b) 856 (c) 658 (d) 685

(iv) Area of sector OABO is _____:

(a) $31.4m^2$ (b) $3.14m^2$ (c) $314m^2$ (d) $0.0314m^2$

(v) Length of major arc AB is _____:

(a) 24.9m (b) 31.4m (c) 94.2m (d) 86.3m

10. A fruit market was selling apples in packing boxes carrying varying number of apples as shown in the figure:

No. of apples	20-30	30-40	40-50	50-60	60-70	70-80
No. of boxes	9	10	6	8	4	7

(i) What will be the frequency of the modal class?

(a) 10 (b) 6 (c) 9 (d) 8

(ii) What will be the upper limit of the median class?

(a) 30 (b) 40 (c) 50 (d) 60

(iii) How many boxes contain more than 40 apples?

(a) 20 (b) 25 (c) 30 (d) 35

(iv) Difference between the class marks of the median class and the modal class:

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

(v) Which of the following is not a measure of central tendency:-

(a) Class Interval (b) Mean (c) Median (d) Mode

Part: B

11. The product of two numbers is 1600. If their HCF is 20, find their LCM.
12. Form a quadratic polynomial whose zeroes are $3 + \sqrt{5}$ and $3 - \sqrt{5}$.
13. Solve the following equations by elimination method: $2x + 3y = 7$ and $3x + 4y = 10$
14. Find the roots of the quadratic equation $2x^2 - 2\sqrt{2}x + 1 = 0$, if they exist, using Quadratic formula.

    OR

    Find the roots of the equation: $\frac{1}{x} - \frac{1}{x-2} = 3$.
15. Find the coordinates of the points of tri-section of the line segment joining $(4, -1)$ and $(-2, -3)$.

    OR

    Find the values of y for which the distance between the points P $(2, -3)$ and Q $(10, y)$ is 10 units.
16. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 60^0.
17. As observed from the top of a building 100m high, the angle of depression of a car, moving directly towards it changes from 30^0 to 60^0. Find the distance travelled by the car during the period of observation. ($\sqrt{3} = 1.73$)

    OR

    A tree is broken by the wind. The top struck the ground at an angle of 30^0 and at a distance of 30m from the root. Find the whole height of the tree. ($\sqrt{3} = 1.73$)
18. State and prove Pythagoras theorem.

    Two vertical poles of height 10 m and 15 m stand on a plane ground. If the distance between their feet is 12 m, find the distance between their tops.

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