R. C. B. S. E.

SECOND PERIODIC EXAMINATION 2018-19

SET A

STD. : X

SUB. : MATHEMATICS

MARKS: 50

TIME: HRS.

General Instructions: -

- *All questions are compulsory.*
- *The question paper consist of 18 questions divided into 4 sections A, B, C and D. Section A comprises of 3 questions of 1 mark each, Section B comprises of 4 questions of 2 marks each, Section C comprises of 5 questions of 3 marks each and Section D comprises of 6 questions of 4 marks each.*
- *There is no overall choice.*

SECTION – A [3 x 1 = 3 MARKS]

1. Write the HCF of the smallest composite number and smallest prime number.

2. Find the value of k so that the following system of equations has no solutions:

$3x - y - 5 = 0,\ \ 6x - 2y + k = 0.$

3. If α, β are the zeroes of a polynomials, such that $\alpha + \beta = 6$ and $\alpha\beta = 4$, then write the polynomial.

SECTION – B [4 x 2 = 8 MARKS]

4. Find the value of sec 45° geometrically.

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

6. The weights (in kg) of 50 wrestlers are recorded in the following table.

Weight (in kg)	100 – 110	110 – 120	120 – 130	130 – 140	140 – 150
Number of wrestlers	4	14	21	8	3

Find the mean weight of the wrestlers by step deviation method.

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7. Two dice are numbered (1, 2, 3, 4, 5, 6) and (1, 1, 2, 2, 3, 3) respectively. They are thrown and the sum of the numbers on them is noted. Find the probability of getting the sum 2 and 8 separately.

SECTION – C [5 x 3 = 15 MARKS]

8. Draw less than and more than type ogive for the following frequency distribution and hence find the median.

Class Interval	0 – 4	4 – 8	8 – 12	12 – 16	16 – 20
Frequency	2	5	7	4	2

9. What is the probabaility for a family with three children to have a boy and two girls (Assuming the probability of having a boy or a girl is equal)?

10. A vessel is in the form of an inverted cone. Its height is 8cm and the radius of its top, which is open, is 5cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5cm are dropped into the vessel, one – fourth of the water flows out. Find the number of lead shots dropped in the vessel.

11. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

12. Find the ratio in which the line segment joining A(1, -5) and B(- 4, 5)is divided by the x – axis. Also find the coordinates of the point of division.

SECTION – D [6 x 4 = 24 MARKS]

13. The lower window of a house is at a height of 2m above the ground and its upper window is 4m vertically above the lower window. At certain instant the angles of elevation of a balloon from these windows are observed to be 60° and 30°, respectively. Find the height of the balloon above the ground.

14. Ujj's house has an overhead tank in the shape of a cylinder. This is filled by pumping water from a sump (an underground tank) which is in the shape of

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a cuboid. The sump has dimensions 1.57m x 1.44m x 95cm. The overhead tank has its radius 60 cm and height 95 cm. Find the height of the water left in the sump after the overhead tank has been completely filled with water from the sump which had been full. Compare the capacity of the tank with that of the sump (Use $\pi = 3.14$)

15. Prove that $\frac{(1+\sec\theta-\tan\theta)}{1+\sec\theta+\tan\theta} = \frac{(1-\sin\theta)}{\cos\theta}$

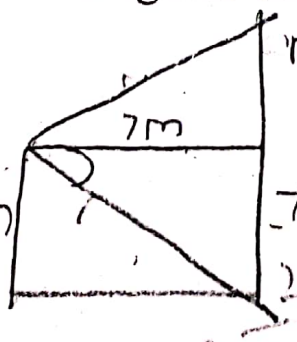
16. If $A(-5,7), B(-4,-5), C(-1,-6)$ and $D(4,5)$ are the vertices of the quadrilateral, find the area of the quadrilateral ABCD.

17. Size of the agricultural holdings in a survey of 200 families is given in the following table: -

Size of agricultural holdings (in hec)	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35
Number of families	10	15	30	80	40	20	5

Compute median and mode size of the holdings.

18. From the top of a 7m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Find the height of the tower.



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