2020-21
X– MATHEMATICS - PAPER –1
MODEL PAPER-2, E/M

CLASS-X   PART: A & B   MAX, MARKS: 80   TIME: 3.15 Hrs

PART – A

SECTIONS: I (6x2=12Marks)

Group - A

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1) Verify that the points (1-6), (3-4) (4, -3) are collinear or not ?

2) Is 7 X 5 X 3 X 2 X +3 composite number ? Justify your answer ?

3) If A= {1,2,3}; B= {2,3,4,5} find A U B and A ∩ B ?

4) Check whether -2 and 2 are the zeros of the polynomial x^4-16 ?

5) Formulate a pair of linear equations in two variables "5 Pencils and 7 Pens together cost Rs. 50 whereas 7 Pencils and 5 Pens together cost Rs. 46 ?

6) Find two members whose sum is 27 and product is 182

Group – B

7. Find the median of $\frac{2}{3}, \frac{4}{5}, \frac{1}{2}, \frac{3}{4}, \frac{6}{5}$?

8. ABC is an isosceles triangle with right angled at 'c' prove that $AB^2 = 2Ac^2$

9. A Cylinder and cone have bases of equal radii and are of equal heights show that their volumes are in the ratio 3:1?

10. Find $\frac{sin30^0 + Tan\,45^0 - cosec\,60^0}{cot45^0 + cos\,60^0 - sec30^0}$? $(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \cdots$

11. Rinky observation a flower on the ground from the balcony of the first floor of a building at an angle of depression β the height of the first floor Building is 'x' meters. Draw the diagram for this data ?

12. If P(E) = $\frac{2021}{2022}$ then find P(Ē) ?

SECTIONS II (4x4=16 Marks)
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13) Find the zeros of the quadratic polynomial $x^2+7x+10$ and verify the relationship between the zeros and the co-efficient ?

14) Find the roots of the equation $2x^2-5x+3=0$ by factorisation ?

15) Which term of the A.P : 21, 18, 15, ... is -81 ?

16) For what value of 'k' the pair of equations $3x+4y+2=0$ and $9x+12y+k=0$ represent coincident lines ?

17) One card is drawn from a well-shuffled deck of 52 cards find the probability of getting   1) a face card   2) jack of hearts   3) a spade   4) Queen of diamonds?

18) Draw less than ogive curve of the following distribution

Classes	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	9	16	24	15	4	2

19) If x = asecθ and y = bTanθ, then prove that $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$

20) The curved surface area of a cone is 4070cm² and its diameter is 70 cm what is its slant height ?

SECTIONS III (4x8=32 Marks)

Group - A

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21) Find the ratio in which the Y-axis divides the line segment joining the points (5, -6) and (-1, -4) also find the point of intersection ?

22) A sum of Rs. 700 is to be used to give seven (07) cash prizes to students of a school for their overall an academic performance. If each prize is Rs. 20 less than its preceding prize, find the value of each prizes ?

23) If $(2.3)^x = (0.23)^y = 1000$, then find the value of $\frac{1}{x} - \frac{1}{y}$?

24) Draw the graph of P(x) = x^2-6x+9 and find zeroes verify the zeroes of the polynomial ?

Group - B

25) Construct a triangle similar to a given triangle ABC its sides equal to $\frac{3}{4}$ of corresponding sides of ∆ ABC ?

26) A sports company was ordered to prepare 100 paper cylinders for packing shuttle cocks. The required dimensions of the cylinder are 35cm length / height and its radius is 7cm find the required are of thick paper sheet needed to make 100 cylinders ?

27) Angle of elevation of the top of a tower from the foot of a building is 30^0 and the angle of elevation of the top of the building from the foot of the tower is 60^0, what is the ratio of heights of tower and building ?

28) The marks obtained in Mathematics by 30 students of class X of a certain school are given in table below. Find the mean of the Marks obtained by the students.
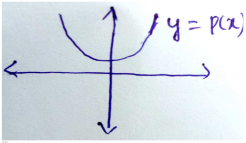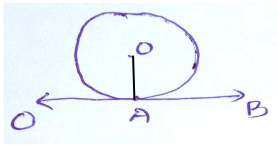
Class interval	10-25	25-40	40-55	55-70	70-85	85-100
No. of Students	2	3	7	6	6	6

PART - B
BIT PAPER

Time : 30 Min   (20x1=20 Marks)

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1) Which of the following is irrational ?   [   ]

   (a) $\sqrt{4}$ (b) $\sqrt{3}$ (c) $\sqrt{16}$ (d) $\sqrt{1}$

2) Degree of $5x^7-6x^5+7x+1$ is   [   ]

   (a) 4   (b) 1   (c) 7   (d) 3

3) Which of the following pairs of equations represent inconsistent system

                                                            [   ]

   (a) 2x+3y=8   (b) 6x+3y=9   (c) 2x+5y=11   (d) 3x-4y=6
       5x-4y=3   x-8y=0   4x+10y=21   6x-8y=12

4) The sum of first 100 natural number is _____   [   ]

   (a) 4050   (b) 4500   (c) 5500   (d) 5050

5) In a quadratic equation $ax^2+bx+c=0$ if $b^2-4ac >0$ then their roots are _____   [   ]

   (a) real and distinct   (b) real and equal
   (c) imaginary   (d) None

6) If n(A U B)=8, n(A0 = 6, n(B)=4 then n (A∩B)=   [   ]

   (a) 2   (b) 4   (c) 6   (d) 8

7) The angle between X – axis and Y- axis is _____   [   ]

   (a) 0^0 (b) 180^0 (c) 360^0 (d) 90^0

8) In Δ ABC, $BC^2 + AB^2 = AC^2$ then ___ is the right angle   [   ]

(a) $<B$ (b) $<A$ (c) $<C$ (d) None

9) The common point to a tangent and a circle is called ___   [   ]

(a) Point of contact   (b) circle   (c) tangent   (d) None

10) The volume of a cone with base 7cm is 462 cc, it's height is [   ]

(a) 9 cm   (b) 18 cm   (c) 3 cm   (d) 27 cm

11) $2 - 2\sin^2 60^0 =$ ___   [   ]

(b) $\sin 60^0$ (b) $\tan 60^0$ (c) $\cos 60^0$ (d) $\sec 60^0$

12) Example of a Pythagorean Triplet is   [   ]

(a) 5,12,13   (b) 5,10,11   (c) 8,9,11   (d) None

13) If an event can't occur then its probability is   [   ]

(a) 1   (b) $\frac{3}{4}$ (c) $\frac{1}{2}$ (d) 0

14) Which one of the following is not a measure of central Tendency

[   ]

(a) mean   (b) median   (c) range   (d) mode

15)   The graph of Y=P(x) (given in the figure) how

many zeros   [   ]

(a) 2   (b) 1   (c) 4   (d) None

16) The prime factorization of 144 is _____   [   ]

(a) $4^2 \times 3^2$ (b) 16×9 (c) 12×12 (d) $2^4 \times 3^2$

17) If A={1,2,3,4}   B= {2,4,6,8} then A-B= _____   [   ]

(a) {6,8}   (b) {1,2}   (c) {1,3}   (d) None

18) Mean of 5,7,9,x is 9 then x =   [   ]

(a) 19   (b) 11   (c) 10   (d) 15

19) $P(E) + P(\bar{E}) =$ _____   [   ]

(a) 0   (b) 2   (c) 1   (d) None

20) In the figure 'A' is called   [   ]

(a) Radius   (b) Point of contact   (c) centre   (d) Diameter