

**2020-21**  
**X- MATHEMATICS - PAPER -1**  
**MODEL PAPER-4, E/M**

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

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**PART - A**

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SECTIONS: I (6x2=12Marks)

**Group - A**

- .....
- 1) Find H.C.F. and L.C.M. of 60 and 100 by prime factorization method?
  - 2) Check whether  $A = \{1, 3, 5, 7\}$  and  $B = \{2, 4, 6, 8\}$  is disjoint sets or not? Justify your answer ?
  - 3) Find the quadratic polynomial whose zeros are 2 and  $-1/3$  ?
  - 4) Find the slope of the line passing through the points (4, -8) and (5, -2) ?
  - 5) The quadratic equation  $2x^2+kx+3=0$  is have two equal roots then find 'k' value ?
  - 6) Find the value of 'K' for which the pair of equations  $2x-ky+3=0$ ,  $4x+6y-5=0$  represent parallel lines

**Group - B**

7. A Ladder 25m long reaches a window of building 20m above the ground. Determine the distance from the foot of the ladder to the building ?
8. Write the formula for volume of cone and explain symbols in words ?
9. Find the mode: 20, 3, 7, 1, 3, 4, 6, 7, 19, 15, 7, 18, 3 ?
10. A dice is thrown at once find the probability of getting an even prime number on it's face ?
11. If  $\sin A = \cos B$ , then prove that  $A+B = 90^\circ$  ?
12. A tangent PQ at point P of a circle of radius 5cm meets a line through the centre 'O' at a point Q so that  $OQ = 13\text{cm}$ , find length of PQ ?

SECTIONS II (4x4=16 Marks)

- 13) Write the formula for finding the median of grouped data? Explain each term it?
- 14) In a flower bed, there are 23 rose plants in the first row, 21 in the second, 19<sup>th</sup> in the third and so on there are 5 rose plants in the last row. How many rows there in the flower bed ?
- 15) A train travels 360 Km at a uniform speed. If the speed had been 5 Km/h more. It would have taken 1 hour less for the same journey. Find the speed of the train ?
- 16) Solve the given pair of equations using substitution method ?  
 $2x - y = 5$   
 $3x + 2y = 11$
- 17) A Sphere, a cylinder and a cone have the same radius and same height. Find the ratio of their volumes ?
- 18) A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball determine the number of blue balls in the bag ?
- 19) Show that  $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec} \theta + \cot \theta$  ?
- 20) A survey conducted on 20 house-holds in a locality by a group of students resulted in the following frequency table for the number of family members in a house-hold?

Family size	1-3	3-5	5-7	7-9	9-11
No. of families	7	8	2	2	1

Find the mode of this data

SECTIONS III (4x8=32 Marks)

**Group - A**

- 21) Draw the graph of  $P(x) = x^2 + 3x - 4$  and find zeros, verify the zeros of the polynomial ?
- 22) If  $x^2 + y^2 = 25xy$ , then prove that  $2 \log(x + y) = 3 \log 3 + \log x + \log y$  ?
- 23) How many multiples of 4 lie between 10 and 250 ?
- 24) In what ratio does the point (-4, 6) divide the line segment joining the points A(-6, 10) and (3, -8) ?

**Group - B**

- 25) Construct a triangle of sides 4cm, 5cm, and 6cm then construct a triangle similar to it whose sides are  $\frac{2}{3}$  of the corresponding sides of the first triangle ?

- 26) If  $\operatorname{cosec}\theta + \cot\theta = p$  then prove that  $\cos\theta = \frac{k^2-1}{k^2+1}$
- 27) An iron pillar consists of a cylindrical portion of 2.8m height and 20cm in diameter and a cone of 42cm height surmounting it find the weight of the pillar if  $1\text{cm}^3$  of iron weights 7.5g. ?
- 28) The table below shows the daily expenditure on food of 25 house-holds in a locality ?

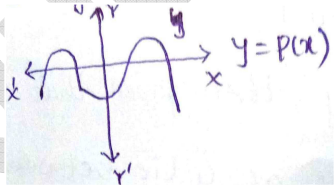
Daily expenditure	100-150	150-200	200-250	250-300	300-350
No. of house-holds	4	5	12	2	2

Find the mean daily expenditure on food by a suitable method ?

**PART - B**  
**BIT PAPER**

Time : 30 Min

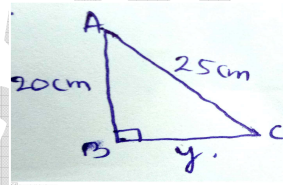
(20x1=20 Marks)

- 1)  $\sqrt{2} - 2$  is .....number ? [   ]  
 (a) Natural      (b) rational      (c) whole      (d) an irrational
- 2) If  $y = p(x)$  is represented by the given graph then the number of zero are [   ]
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- (a) 2                      (b) 3                      (c) 4                      (d) 1
- 3) The equation  $x-4y=5$  has [   ]  
 (a) No solution                      (b) unique solution  
 (c) two solution                      (d) many solution
- 4) In the formula of  $n^{\text{th}}$  term of Arithmetic progression  $t_n = a + (n-1)d$  'd' denotes \_\_\_\_\_ [   ]  
 (a) First term                      (b) common ratio  
 (c) common difference              (d) None
- 5) If  $x + \frac{1}{x} = 2$  then  $x^2 + \frac{1}{x^2} = \_$  [   ]  
 (a) 8                      (b) 0                      (c) 4                      (d) 2

- 6) If  $A \subset B$  then  $A \cup B =$  \_\_\_\_\_ [   ]  
(a)  $\emptyset$       (b)  $\mu$       (c) A      (d) B
- 7) Centroid of 'G' is A (1, -3), B (0, 6) and C (-3, 0) is [   ]  
(a)  $(\frac{8}{9}, \frac{1}{7})$       (b)  $(\frac{6}{7}, \frac{1}{3})$       (c)  $(\frac{1}{2}, \frac{1}{3})$       (d)  $(\frac{-2}{3}, \frac{5}{3})$
- 8) All circles are \_\_\_\_\_ [   ]  
(a) Not similar      (b) similar  
(c) congruent      (d) none
- 9) Angle between the tangent and radius drawn through the point of contact is [   ]  
(a)  $100^\circ$       (b)  $70^\circ$       (c)  $80^\circ$       (d)  $90^\circ$
- 10) The volume of a cylinder is given by the formula  $\pi r^2 h$ , here 'h' represents [   ]  
(a) diameter      (b) height      (c) radius      (d) slant height
- 11) If  $\sin x = \cos x$ ,  $0 \leq x \leq 90^\circ$ , then  $x =$  \_\_\_\_\_? [   ]  
(a)  $30^\circ$       (b)  $90^\circ$       (c)  $0^\circ$       (d)  $45^\circ$
- 12) The length of the shadow of a tree is 8 m long when the sun's angle of elevation is  $45^\circ$  is height of tree \_\_\_\_\_ m [   ]  
(a)  $\frac{8}{\sqrt{3}}$       (b)  $8\sqrt{3}$       (c) 8      (d)  $16\sqrt{3}$
- 13) Let E,  $\bar{E}$  be the complementary events in a random experiment then which of the following is true? [   ]  
(a)  $P(E) + P(\bar{E}) = 2$       (b)  $P(E) + P(\bar{E}) = 3$   
(c)  $P(E) + P(\bar{E}) = 1$       (d) None
- 14) The mean of the first eight multiples of 3 is \_\_\_\_\_ [   ]  
(a) 8      (b) 1.5      (c) 13      (d) 27
- 15) If a, b, c are in A.P; then  $b =$  \_\_\_\_\_ [   ]  
(a)  $\frac{a+c}{2}$       (b)  $a+c$       (c)  $\sqrt{ac}$       (d)  $ac$

- 16) the distance of (3,4) from origin is \_\_\_\_\_ [   ]  
(a) 3      (b) 4      (c) 5      (d) 7
- 17) The number of subsets of a set is 16, then the set has \_\_\_\_\_ elements [   ]  
(a) 1      (b) 2      (c) 3      (d) 4
- 18) Number of secants that can be drawn to circle through a point inside it is \_\_\_\_\_ [   ]  
(a) 0      (b) 1      (c) infinite      (d) 2
- 19) A letter is chosen from the word "BAHUBALI" the probability that it was not a vowel is [   ]  
(a)  $\frac{1}{2}$       (b)  $\frac{3}{2}$       (c)  $\frac{4}{3}$       (d)  $\frac{3}{4}$

20) From the figure  $y =$  \_\_\_\_\_ cm



- (a) 9      (b) 10      (c) 12      (d) 15