

2020-21
X- MATHEMATICS - PAPER -1
MODEL PAPER-5, 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) Is $\log_3 81$ rational or irrational ? Justify your answer ?
 - 2) Verify whether the points (1,5), (2,3) and (-2,-1) are collinear or not ?
 - 3) If $A = \{x: x \in \mathbb{N}, x < 6\}$ and $B = \{x: x \in \mathbb{N}, 3 < x < 8\}$ then show that $A - B \neq B - A$ with the help of venn diagram ?
 - 4) Check whether -1, and $\frac{1}{4}$ are zeros of the polynomial $P(x) = 4x^2 + 3x - 1$?
 - 5) For what positive values of 'p' the following pair of linear equation have infinite solution ?
 $px + 3y - (p-3) = 0$
 $12x + py - p = 0$
 - 6) Find two consecutive positive integers, sum of whose square is 613 ?

Group - B

7. Sangeetha and Reshma play a tennis match. It is know that the probability of Sangeetha winning the machh is 0.62. What is the probability of Reshma winning the match ?
8. 16, 12, 8, 10, 19, 22, 13, 20 given observation find the median ?
9. The top of a clock tower is observed at angle of elevation find of ' α ' and the foot of the tower is at the distance of 'd' meters from the observer. Draw the diagram for this data. ?
10. Write the formula to find the total surface area of cylinder and explain each term?
11. Calculate the length of tangent from a point 15 cm away from the centre of circle of radius 9 cm ?
12. A flag pole 4m tall cast a 6 m shadow. At the same time a nearby building cast a shadow of 24 m. How tall is the building ?

SECTIONS II (4x4=16 Marks)

- 13) Show that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$ ($0^\circ < \theta < 90^\circ$) ?
- 14) One card is selected from a well – shuffled deck of 52 cards. Find the probability of getting ?
 1) A king of Red colour 2) A spade 3) A face card 4) A Red face card
- 15) The following table gives the literacy rate (percentage) of 35 cities. Find the mean literacy rate ?

Literacy in %	45-55	55-65	65-75	75-85	85-95
No. of cities	3	10	11	8	3

- 16) The shape of solid iron rod is cylindrical. Its height is 11cm and base diameter is 7cm. then find the total volume of 50 such roads ?
- 17) Find the zeros of the quadratic polynomial x^2+5x+6 and verify the relationship between the zeros and coefficients ?
- 18) The sum of the 4th and 8th terms of an A.P. is 24 and sum of the 6th and 10th terms is 44. Find the first three terms of the A.P ?
- 19) Solve the following pair of linear equation using substitution method?
 $2x+3y=9$
 $3x+4y=5$
- 20) The altitude of a right triangle is 7cm less than its base. If the hypotenuse is 13cm. find the other two sides ?

SECTIONS III (4x8=32 Marks)

Group - A

- 21) Draw the graph of $P(x) = x^2-x-12$ and find zeros, verify the zeros of the polynomial ?
- 22) Show that $\sqrt{5} - \sqrt{3}$ is an irrational number ?
- 23) How many three digit numbers are divisible by 7?
- 24) Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are (0, -1), (2, 1) and (0, 3). Find the ratio of this area to the are of the given triangle ?

Group - B

- 25) A box contains 90 discs which are numbered from 1 to 90 if one disc is selected at random from the box find the probability that it bears 1) a two-digit number, 2) a perfect square number 3) a number divisible by 5?
- 26) The following distribution gives the state-wise teacher student ratio in higher secondary school of India. Find the mode this given data ?

No. of students	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
No. of students	3	8	9	10	3	0	0	2

- 27) Two cubes each of volume 64cm^3 are joined end to end together find the surface area of the resulting cuboid ?
- 28) A Tower stands vertically on the ground from a point which is 15 meter away from the foot of the tower the angle of elevation of the top of the tower is 45° , what is the height of the tower ?

PART - B
BIT PAPER

Time : 30 Min

(20x1=20 Marks)

- 1) If set A and B are disjoint sets and $n(A)=6$, $n(B) =5$ then $n(A \cup B)$ []
 (a) 11 (b) 6 (c) 5 (d) 1
- 2) The decimal Expansion of 0.225 in its rational form is []
 (a) 225 (b) $\frac{225}{10^2}$ (c) $\frac{225}{10^4}$ (d) $\frac{9}{40}$
- 3) If $p(x) = x^2-4x+5$, then the value of $P(1)$ is []
 (a) 1 (b) 0 (c) 2 (d) 4
- 4) If roots of a quadratic equation $ax^2+bx+c=0$ []
 (a) $\frac{-b+\sqrt{b^2-4ac}}{ac}$ (b) $\frac{-b-\sqrt{b^2-4}}{3}$
 (c) $\frac{-b\pm\sqrt{b-4ac}}{2a}$ (d) $\frac{-b\pm\sqrt{b^2-4ac}}{2a}$
- 5) $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ are _____ equation []
 (a) parallel (b) pair of linear (c) consistent (d) none

- 6) The 10th term of the A.P. ; 3, 11, 19 ----- is []
(a) 73 (b) 16 (c) 75 (d) 85
- 7) The distance between the points (-2, 3) and (2, -3) is []
(a) 0 (b) 52 (c) $\sqrt{52}$ (d) 16
- 8) Two sides of a right triangle are 3cm and 4cm then the third side is []
(a) 9 (b) 6 (c) 6-1 (d) 5
- 9) A circle may have ___ parallel tangents atmost []
(a) 10 (b) 12 (c) 9 (d) 2
- 10) Volume of cylinder is ____cu units []
(a) $\pi r^2 h$ (b) πr^2 (c) $\frac{\pi}{r}$ (d) None
- 11) $\sqrt{1 + \cot^2 \theta} = \underline{\hspace{2cm}}?$ []
(a) $\text{Cosec}^2 \theta$ (b) $1 + \cot \theta$ (c) $\sec \theta$ (d) $\text{cosec} \theta$
- 12) $\sin^2 \theta + \cos^2 \theta = \underline{\hspace{2cm}}$ []
(a) 1 (b) 0 (c) 2 (d) None
- 13) The probability of an impossible event is ? []
(a) 1 (b) 0 (c) 4 (d) None
- 14) $\frac{\text{sum of the objervation}}{\text{No.of objervation}} = \underline{\hspace{2cm}}$ []
(a) mode (b) median (c) mean (d) none
- 15) $\text{Log}_c c^{\sqrt{c}} = \underline{\hspace{2cm}}$ []
(a) 2 (b) -1 (c) 1 (d) $\frac{1}{2}$
- 16) (7,5) \in ____ Quadrant ? []
(a) Q₁ (b) Q₂ (c) Q₃ (d) Q₄
- 17) Which of the following is not a linear equation []
(a) $5 + 4x = y + 3$ (b) $x + 2y = y - x$ (c) $3 - x = y^2 + 4$ (d) $x + y = 0$
- 18) A die is thrown ones then find the probability of even numbers []
(a) $\frac{1}{6}$ (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $\frac{2}{5}$

19) $\frac{1-\tan^2 45^\circ}{1+\tan^2 45^\circ} =$ _____ []

- (a) 1 (b) 0 (c) -1 (d) 8

20) Mean of 23, 24, 24, 22, and 20 is _____ []

- (a) 22.6 (b) 16.2 (c) 18.9 (d) 20.9

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