2023-24

MODEL PAPER

CLASS – 10

SUBJECT - MATHEMATICS

TIME:- 3 hrs 15 mins **M.M. 70**

Instruction- The first 15 minutes are allotted to the candidates for reading the question paper.

GENERAL INSTRUCTIONS:-

1. **All questions are compulsory.**
2. **This question paper has two sections.**
3. **Section A has 20 multiple choice questions of 01 marks each, the answers to which are to be given on the OMR Sheet**
4. **After writing the answers on OMR sheet, do not cut it and do not use eraser,whitener etc.**
5. **Section 'B' contains descriptive questions of 50 marks.**
6. **There are total 5 questions in this section.**
7. **It is clearly written at the beginning of each question as to how many sections have to be attempted.**
8. **Marks allotted to the questions are indicated against them.**
9. **Start from the first question and continue till the end. Don't waste time on questions you are unable to solve.**

SECTION A

MULTIPLE CHOICE QUESTION

1. L.C.M. of any two numbers is 60 and H.C.F is 3. If one number is 12 then other number will be 1

   (i) 20 (ii) 15

   (iii) 180 (iv) 36

2. The product of a non-zero rational number and an irrational number is 1

   (i) Always irrational number (ii) Always rational number

   (iii) Rational or Irrational number (iv) One

3. Solutions of linear equations $x + 2y - 5 = 0$ and $4x + 8y - 20 = 0$ will be 1

   (i) Unique Solution (ii) Inifinitely many solutions

   (iii) No Solution (iv) Two Solutions

4. The largest number by which dividing 70 and 125 gives remainders 5 and 8 respectively is 1

   (i) 13 (ii) 65

   (iii) 875 (iv) 1750

5. The sum of the first 5 multiples of 3 is 1

   (i) 45 (ii) 55

   (iii) 65 (iv) 75

6. Consider the following statements about the quadratic question $2x^2 - 4x + 3 = 0$ 1

(a) The discriminant of the given equation is less than 0.

(b) The equation has no real roots.

(c) The discriminant of the equation is zero.

(d) The roots of given equation are real.

Select the correct option from the following.

(i) a and b are correct (ii) a and d are correct

(iii) c and d are correct (iv) only a is correct

7. AOBC is a rectangle with three vertices points A (0, 3), O (0, 0) and B (5, 0). Its diagonal is 1

(i) 5 (ii) 3

(iii) $\sqrt{34}$ (iv) 4

8. If the equation $x^2 + kx - \frac{5}{4} = 0$ has one root $\frac{1}{2}$ then the value of k is- 1

(i) 2 (ii) -2

(iii) $\frac{1}{4}$ (iv) $\frac{1}{2}$

9. Two triangles are similar 1

(i) If their corresponding angles are equal.

(ii) Their corresponding sides are in the same ratio

(iii) Both of the above.

(iv) None of these

10. If in a right angled Δ ABC $\angle C = 90^0$ AC = 3cm and BC = 4 cm then the measure of the median passing through point C is 1

(i) 2.5 cm (ii) 3 cm

(iii) 3.5 cm (iv) 4 cm

11. If $(\sin\theta - \cos\theta) = 1$ then the value of $(\sin^4\theta + \cos^4\theta)$ is- 1

(i) 1 (ii) $\frac{3}{4}$

(iii) $\frac{1}{2}$ (iv) $\frac{1}{4}$

12. $\sin 2A = 2\sin A$ is true when A is equal to 1

(i) 0^0 (ii) 30^0

(iii) 45^0 (iv) 60^0

13. If $4\tan\theta = 3$ then $\left(\frac{4\sin\theta - \cos\theta}{4\sin\theta + \cos\theta}\right)$ is equal to 1

(i) $\frac{2}{3}$ (ii) $\frac{1}{3}$

(iii) $\frac{1}{2}$ (iv) $\frac{3}{4}$

14. The value of $(\sec A + \tan A)(1 - \sin A)$ will be- 1

(i) secA (ii) sinA

(iii) cosecA (iv) cosA

15. If the angle of a sector of a circle of radius r cm is θ^0 then the area of sector is 1

(i) $\frac{\pi r^2\theta}{360°}$ (ii) $\frac{\pi r^2\theta}{180°}$

(iii) $\frac{2\pi r\theta}{360°}$ (iv) $\frac{2\pi r\theta}{180°}$

16. A pot having long neck is a combination of 1

(i) a sphere and a cylinder

(ii) a hemi-sphere and a cylinder

(ii) two hemi-spheres

(iv) a cylinder and a cone

17. The mean of positive odd numbers from 1 to 10 will be- 1

(i) 2 (ii) 3

(iii) 4 (iv) 5

18. The median of data 13, 15, 16, 17, 19, 20 will be 1

(i) $\frac{30}{2}$ (ii) $\frac{31}{2}$

(iii) $\frac{33}{2}$ (iv) $\frac{35}{2}$

19. If the mean of some observations is 27 and mode is 45 then the median is 1

(i) 32 (ii) 33

(iii) 34 (iv) None of these

20. When a dice thrown the probability of getting an odd number less than 3 is 1

(i) $\frac{1}{6}$ (ii) $\frac{1}{3}$

(iii) $\frac{1}{2}$ (iv) 0

SECTION B

1. Attempt all sections

(a). Prove that $3 \times 5 \times 7 + 7$ is a composite number 2

(b). If $\cot\theta = \frac{7}{8}$, then find the value of $\frac{(1+\sin\theta)(1-\sin\theta)}{(1+\cos\theta)(1-\cos\theta)}$. 2

(c). Two cubes with a volume of 64 cm^3 each are joined end to end. Find the surface area of resulting cuboid. 2

(d). Find the mean of the following data. 2

Class Interval	10-20	20-30	30-40	40-50	50-60	60-70
Frequeny	2	7	12	15	8	6

(e). Find the ratio in which the line segment joining the points A (-6, 10) and B (3, -8) is divided by point (-4, 6). 2

(f). Find the relation between X and Y such that point (X, Y) is equidistant from the points (3, 6) and (-3, 4). 2

2. Attempt any five of the following

(a). Find the zeros of the quadratic polynomial $6x^2 - 3 - 7x$ and verify the relation between zeros and coefficient. 4

(b). The difference of squares of two numbers is 180. The square of smaller number is 8 times the larger number. Find both the numbers. 4

(c). Prove that the tangents drawn at the ends of any diameter of a circle are parallel. 4

(d). Prove that the angle between tangents drawn from an external point to a circle is the complement of the angle subtended at the centre by the line segment joining the tangents. 4

(e). There are 3 red and 5 black balls in a bag. A ball is drawn randomly from the bag. What is the probability that the ball drawn is (i) Red. (ii) Not Red. 4

(f). Median of the following data is 28.5 If sum of frequencies is 60 then find the value of x and y.

Class Interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	5	x	20	15	y	5

4

3. The sum of a two-digit number and the number formed by reversing its digit is 66. If the difference between the digits of the number is 2 then find the number and how many such numbers are there. 6

OR

Five years ago, Noori's age was three times that of Sonu. After 10 years, Noori's age will be twice the age of Sonu. Find the present age of Noori and Sonu? 6

4. The angle of depression of the top and bottom of an 8 m high building when viewed from the top of multi-storey building are 30^0 and 45^0 respectively. Find the height of multi-storey building and the distance between the two buildings. 6

or

The angle of elevation of the top of 10 m high building from a point P on the ground is 30^0. A Flag is hoisted on the top of the building and the angle of elevation of the top of the flag from P is 45^0. Find the length of the flag pole and the distance of the building from point P. ($\sqrt{3} = 1.732$) 6

5. A vessel in the shape of inverted cone having radius 5 cm and height 8 cm which is open at the top. It is filled with watertill the top. When some balls each of radius 0.5 cm are put in the vessel. Then $1/4^{th}$ of the the water over flows. Find the numbers balls put in the vessel. 6

OR

A spherical glass vessel has a cylindrical neck 8 cm long and, 2 cm in diameter, the diameter of the spherical part is 8.5 cm. By measuring the amount of water it holds a child find its volume to be 345 cm^3. Check whether she is correct, taking the above as the inside measurement. ($\pi = 3.14$)