

MODEL QUESTION PAPER SET- 1 : 2021 - 22

STD 10TH – MATHS - I (THEORY)

MM: 40

Time : 2 Hrs

ENTIRE SYLLABUS:**Q.1 A) Solve Multiple choice questions.****(4)**

1) Which one is a quadratic equation?

a. $\frac{5}{x} - 3 = x^2$

b. $x(x + 5) = 2$

c. $n - 1 = 2n$

d. $\frac{1}{x^2} (x + 2) = x$

2) The sum of two natural number is 25 and their difference is 7. The numbers are

- a. 17 and 8 b. 16 and 9 c. 18 and 7 d. 15 and 10

3) A card is selected at random from a well-shuffled deck of 52 cards. The probability of its being a face card is

- a.
- $\frac{3}{13}$
- b.
- $\frac{4}{13}$
- c.
- $\frac{6}{13}$
- d.
- $\frac{9}{13}$

4) In an A.P. 1st term is 1 and the last term is 20. The sum of all terms is = 399 then n =

- a. 42 b. 38 c. 21 d. 19

B) Solve the following questions.**(4)**

1) Find the value of the following determinants.

$$\begin{vmatrix} -3 & 8 \\ 6 & 0 \end{vmatrix}$$

2) Joseph kept 26 cards in a cap, bearing one English alphabet on each card. One card is drawn at random. What is the probability that the card drawn is a vowel card ?

3) Write an A.P. whose first term is a and common difference is d in each of the following.

a = - 3, d = 0

4) Determine whether the values given against each of the quadratic equation are the roots of the equation.

$x^2 + 4x - 5 = 0, x = 1$

Q.2 A) Complete the following Activities. (Any Two)**(4)**

1) Form a 'Road safety committee' of two, from 2 boys (B1, B2) and 2 girls(G1, G2).

Complete the following activity to write the sample space.

(a) Committee of 2 boys = _____

(b) Committee of 2 girls = _____

(c) Committee of one boy and one girl = _____

 \therefore Sample space = {_____}

2) The first term of an A. P. is 5 and the common difference is 4. Complete the following activity and find the sum of the first 12 terms of the A. P.

a = 5, d = 4, $s_{12} = ?$

$S_n = \frac{n}{2}$ _____

$S_{12} = \frac{12}{2} [10 + \text{_____}]$

$= \frac{12}{2} [10 + 44]$

$= 6 \times \text{_____}$

3) Fill in the blanks with correct number

$$\begin{vmatrix} 3 & 2 \\ 4 & 5 \end{vmatrix}$$

$$= 3 \times \underline{\quad} - \underline{\quad} \times 4$$

$$= \underline{\quad} - 8$$

$$= \underline{\quad}$$

B) Solve the following questions. (Any four)

(8)

- 1) Find the fourth term from the end in an A.P. – 11, – 8, – 5, . . . , 49.
- 2) Two coins are tossed simultaneously, Find the probability of getting at least one head.
- 3) Solve : $x + y = 4$; $x - y = 2$.
- 4) Solve the following quadratic equations by factorization.
 $3x^2 - x - 10 = 0$
- 5) Find the sum of first n odd natural numbers.

Q.3 A) Complete the following Activity (Any one)

(3)

- 1) The roots of each of the following quadratic equations are real and equal, find k.
 $3y^2 + ky + 12 = 0$

$$\text{Here, } a = 3, b = k, c = 12$$

$$\begin{aligned} \Delta &= \underline{\quad} \\ &= k^2 - 4(3)(12) \\ &= \underline{\quad} \end{aligned}$$

The roots are real and equal

... (Given)

$$\begin{aligned} \therefore \Delta &= \underline{\quad} \\ \therefore k^2 - 144 &= 0 \\ \therefore \underline{\quad} &= 0 \\ \therefore k + 12 = 0 \text{ or } k - 12 &= 0 \\ \therefore k = \underline{\quad} \text{ or } k = \underline{\quad} \end{aligned}$$

- 2) Solve the following simultaneous equations using Cramer's method.

$$4m + 6n = 54$$

$$3m + 2n = 28$$

$$\begin{aligned} D &= \begin{vmatrix} 4 & 6 \\ 3 & 2 \end{vmatrix} \\ &= (4 \times 2) - (6 \times 3) \\ &= 8 - 18 \end{aligned}$$

$$\therefore D = \underline{\quad}$$

$$\begin{aligned} D_m &= \begin{vmatrix} 54 & 6 \\ 28 & 2 \end{vmatrix} \\ &= (54 \times 2) - (6 \times 28) \\ &= 108 - 168 \end{aligned}$$

$$\therefore D_m = \underline{\quad}$$

$$\begin{aligned} D_n &= \begin{vmatrix} 4 & 54 \\ 3 & 28 \end{vmatrix} \\ &= (4 \times 28) - (54 \times 3) \\ &= 112 - 162 \end{aligned}$$

$$\therefore D_n = \underline{\quad}$$

By Cramer's rule

$$m = \frac{Dm}{D} = \underline{\quad\quad} = 6 \text{ and}$$

$$n = \underline{\quad\quad} = \frac{-50}{-10} = 5$$

\therefore $m = \underline{\quad\quad}$, $n = \underline{\quad\quad}$ is the solution of given simultaneous equations.

B) Solve the following questions. (Any two)

(6)

- 1) In an A.P. 17th term is 7 more than its 10th term. Find the common difference.
- 2) Solve: $5x^2 - 4x - 3 = 0$ by completing square method.
- 3) There are three boys and three girls. An environment committee of two is to be formed. Write the sample space S, the number of sample points $n(S)$. Express the following events and find the total number of elements in the following events: A is the event that the committee should contain at least two girls. B is the event that the committee should contain both the boys. C is the event that there is only one girl in the committee. D is the event that there is at the most one boy in the committee.
- 4) Solve the following simultaneous equations.
 $99x + 101y = 499$; $101x + 99y = 501$

Q.4 Solve the following questions. (Any two)

(8)

- 1) Two years ago, my age was $4\frac{1}{2}$ times the age of my son. Six years ago, my age was twice the square of the age of my son. What is the present age of my son?
- 2) Find three consecutive terms in an A.P. whose sum is - 3 and the product of their cubes is 512.
- 3) There are six cards in a box, each bearing a number from 0 to 5. Find the probability of each of the following events, that a card drawn shows,
 (1) a natural number. (2) a number less than 1. (3) a whole number. (4) a number is greater than 5.

Q.5 Solve the following questions. (Any one)

(3)

- 1) All the three face cards of spades are removed from a well-shuffled pack of 52 cards. A card is then drawn at random from the remaining pack. Find the probability of getting
 - i. a black face card
 - ii. a queen
 - iii. a black card
 - iv. a heart
 - v. a spade
 - vi. '9' of black colour
- 2) Solve: $15x + 17y = 21$; $17x + 15y = 11$
