



**SUB. : Mathematics Part - I**  
**STD. : 10 (English)**  
**TIME: 2 hrs**  
**DATE: 21-Sep-2021**

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**Marks: 40**

**Q.1 A) Solve Multiple choice questions.**

**(4)**

- 1) Taxable value of a television set is 25,000. if rate of G.S.T. is 28% calculate the amount payable by the consumer.  
a. Rs. 25,000      b. Rs. 7,000      c. Rs. 32,000      d. Rs. 31,500
- 2) If the equation  $2x^2 - 5x + (k + 3) = 0$  has equal roots then the value of K is  
a.  $\frac{9}{8}$       b.  $-\frac{9}{8}$       c.  $\frac{1}{8}$       d.  $-\frac{1}{8}$
- 3) The 11th term of the A.P.  $-3, -\frac{1}{2}, 2, \dots$  is  
a. 28      b. 22      c. -38      d.  $-48\frac{1}{2}$
- 4) If the probability of an event is p, then the probability of its complementary event will be  
a.  $p - 1$       b. p      c.  $1 - p$       d.  $1 - \frac{1}{p}$

**B) Solve the following questions.**

**(4)**

- 1) Courier service agent charged total Rs. 590 to courier a parcel from Nashik to Nagpur. In the tax invoice taxable value is Rs. 500 on which CGST is Rs. 45 and SGST is Rs. 45. Find the rate of GST charged for this service.
- 2) If two coins are tossed simultaneously, find the probability of getting a head on both the coins.
- 3) Find the first term and common difference for each of the A.P.  
5, 1, - 3, - 7
- 4) Write the quadratic equation whose roots are - 3 and - 11.

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

**(4)**

- 1) Write the correct number in the given boxes from the following A.P.  
- 3, - 8, - 13, - 18 .....

Here  $t_1 = - 3, t_2 = - 8, t_3 = \underline{\hspace{2cm}}, t_4 = -18$

$t_2 - t_1 = \underline{\hspace{2cm}}, t_3 - t_2 = \underline{\hspace{2cm}}$

$\therefore a = \underline{\hspace{2cm}}, d = \underline{\hspace{2cm}}$

- 2) Form the quadratic equation from its roots. 0 and 7

Let  $\alpha$  and  $\beta$  be the roots of the quadratic equation.

Let  $\alpha = \underline{\hspace{2cm}}$  and  $\beta = 7$

$\therefore \alpha + \beta = \underline{\hspace{2cm}} = 7$  and

$\alpha \times \beta = 0 \times 7 = 0$

Then required quadratic equation is

$\therefore x^2 - \underline{\hspace{2cm}}x + \underline{\hspace{2cm}} = 0$

$\therefore x^2 - \underline{\hspace{2cm}}x + 0 = 0$

- 3) Complete the following activity to solve the simultaneous equations  $3x + 2y = 6$  and  $2x + 4y = 12$  by Cramer's method.

$$D = \begin{vmatrix} 3 & 2 \\ 2 & 4 \end{vmatrix} = 8$$

$$D_x = \begin{vmatrix} 6 & 2 \\ 12 & 4 \end{vmatrix} \\ = \underline{\hspace{2cm}} \\ = 0$$

$$D_y = \begin{vmatrix} 3 & 6 \\ 2 & 12 \end{vmatrix} \\ = \underline{\hspace{2cm}} \\ = 36 - 12 \\ = 24$$

$$x = \frac{D_x}{D} = \frac{0}{8} = \underline{\hspace{2cm}}$$

$$y = \frac{D_y}{D} = \frac{24}{8} = \underline{\hspace{2cm}}$$

**B) Solve the following questions. (Any four)****(8)**

- 1) Krishna Electricals had bought a TV from a wholesaler at Rs. 36,000. The marked price on it in Krishna Electricals was Rs. 50,000. If it was sold to Kalyan Deshmukh at 10% discount, calculate the input GST and output GST for Krishna Electricals if the rate of GST is 18%.
- 2) A card is drawn at random from a pack of well shuffled 52 playing cards. Find the probability that the card drawn is -  
(1) an ace. (2) a spade.
- 3) If  $x = 5$  and  $y = 3$  is the solution of  $3x + ky = 3$ . find the value of  $k$ .
- 4) Determine whether the gives values of  $x$  is the root of given quadratic equation  $6x^2 - x - 2 = 0$ ,  $x = \frac{3}{2}$
- 5) Find the sum of first  $n$  odd natural numbers.

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

- 1) Out of a group of swans,  $\frac{7}{2}$  times the square root of number of swans are playing on the shore of the tank. Remaining two are quarreling in the water. Calculate number of Swans.

Let us denote number of swans by  $x$ .

Then the number of swans playing on the shore of the tank = \_\_\_\_\_

There are two swans quarreling in the water

By given condition,

$$x = \frac{7}{2}\sqrt{x} + 2$$

$$\therefore x - 2 = \frac{7}{2}\sqrt{x}$$

$$\therefore (x - 2)^2 = \left(\frac{7}{2}\right)^2 \times x$$

$$\therefore 4 \underline{\hspace{2cm}} = 49x$$

$$\therefore 4x^2 - 65x + 16 = 0$$

$$\therefore \underline{\hspace{2cm}} = 0$$

$$\therefore 4x^2 - 64x - x + 16 = 0$$

$$\therefore 4x(x - 16) - 1(x - 16) = 0$$

$$\therefore (x - 16)(4x - 1) = 0$$

$$\therefore (x - 16) = 0 \text{ or } (4x - 1) = 0$$

$$\therefore x = \underline{\hspace{2cm}} \text{ or } x = \underline{\hspace{2cm}}$$

We reject  $x = \underline{\hspace{2cm}}$  and take  $x = 16$

Hence the total number of swans is \_\_\_\_\_

- 2) The sum of the measures of angles of a triangle is  $180^\circ$ , of a quadrilateral is  $360^\circ$ , of a pentagon is  $540^\circ$ , and so on. Assuming this pattern, find the sum of the measures of angles of a dodecagon (i.e. polygon with 12 sides).

Term number (n)	1	2	3	...	10	...
Sides of the polygon	3	4	5	...	12	...
Sum of the measures of angles	$180^\circ$	$360^\circ$	$540^\circ$	...	...	...

Thus we have the first term  $a =$  \_\_\_\_\_

The second term \_\_\_\_\_ =  $360$ , i.e.  $180 + 180$ ,

The third term \_\_\_\_\_ =  $540$ , i.e.  $180 + 2 \times 180$ ,

Thus we get each term by adding  $180$  to the preceding term, here  $d = 180$ .

We have  $t_n = a + (n - 1) d$ .

$$\therefore t_{10} = \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$\therefore = \underline{\hspace{2cm}}$$

Thus the sum of the measures of angles of a dodecagon in \_\_\_\_\_

**B) Solve the following questions. (Any two)**

**(6)**

- 1) Solve the following simultaneous equations using Cramer's method.  
 $3x - 4y = 10$  ;  $4x + 3y = 5$

- 2) Find the median rainfall:

<b>Rainfall (in mm)</b>	100 - 150	150 - 200	200 - 250	250 - 300
<b>Number of cities</b>	4	8	12	6

- 3) Three coins are tossed simultaneously. Find the probability of following events.

- Getting exactly two heads.
- Getting at least two heads.
- Getting no head.
- Getting at the most two tails.

- 4) The roots of each of the following quadratic equations are real and equal, find  $k$ .  
 $kx(x - 2) + 6 = 0$

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

**(8)**

- 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?
- Find three consecutive terms in an A.P. whose sum is  $-3$  and the product of their cubes is  $512$ .
- The following is the frequency distribution of blood pressure measured for patients Draw a frequency polygon.

<b>Blood pressure</b> (in suitable units)	110 - 115	115 - 120	120 - 125	125 - 130	130 - 135
<b>Number of patients</b>	5	35	50	20	5

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

**(3)**

- Write an A.P. in which  $a = 10$  and  $d$  is any natural number.
  - Find the sum of the first ten terms using formula.

- iii. Can - 80 be a term of this A.P. ? Justify.
- 2) On Diwali eve, two candles, one of which is 3 cm longer than the other are lighted. The longer one is lighted at 5.30 p.m. and the shorter at 7 p.m. At 9.30p.m. they both are of the same length. The longer one burns out at 11.30p.m. and the shorter one at 11 p.m. How long was each candle originally?