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# Nayak's Tutorials



Way to Excellence

Date : -

Practice Paper -II

Marks: 40

MATHEMATICS – ALGEBRA - PAPER -1

Duration: 2 Hr.

## Q.1.A) Multiple Choice Questions

4

- The measure of central tendency of a statistical data which takes into account all the data is
  - mean
  - median
  - mode
  - range
- The sum of two natural number is 25 and their difference is 7. The numbers are
  - 17 and 8
  - 16 and 9
  - 18 and 7
  - 15 and 10
- Out of one digit prime numbers, one number is selected at random. The probability of selecting an even number is
  - $\frac{1}{2}$
  - $\frac{1}{4}$
  - $\frac{4}{9}$
  - $\frac{2}{5}$
- The quadratic equation  $2x^2 - \sqrt{5}x + 1 = 0$  has
  - two distinct real roots
  - two equal real roots
  - no real roots
  - more than two real roots

## Q 1.B) Answer the following.

4

- The first term 'a' and common difference 'd' are given. Find first four terms of A.P.  
a = 200, d = 7.
- Find the values of following determinant.

$$\begin{vmatrix} -1 & 7 \\ 2 & 4 \end{vmatrix}$$

- How many possibilities are there in the following?

Vanita knows the following sites in Maharashtra. She is planning to visit one of them in her summer vacation.

Ajintha, Mahabaleshwar, Lonar Sarovar, Tadoba wild life sanctuary, Amboli, Raigad, Matheran, Anandavan.

- Prepare a frequency table from the following distribution table:

Class	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
c.f. (less than type)	3	10	20	28	30

## Q.2A) Answer the following.(Activity)(Any two)

4

- Complete the table to solve the following simultaneous equation:  $x + y = 3$

x	3	_____	_____
y	_____	5	3
(x, y)	(3, 0)	_____	_____

2. Factorise  $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$  by completing the following activity?

Solution:  $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

$\therefore \sqrt{2}x^2 + 5x + 2x + 5\sqrt{2} = 0$

$\therefore x(\sqrt{2}x + 5) + \sqrt{2} \underline{\hspace{1cm}} = 0$

$\therefore \underline{\hspace{1cm}}(x + \sqrt{2}) = 0$

$\therefore \underline{\hspace{1cm}} = 0$  or  $x + \sqrt{2} = 0$

$\therefore x = \underline{\hspace{1cm}}$  or  $x = -\sqrt{2}$

$\therefore$  The roots of the given quadratic equation are  $\underline{\hspace{1cm}}$  and  $-\sqrt{2}$

3. Two dice are rolled simultaneously. Find the probability that

i. the sum of the numbers on their upper faces is at the most 5.

ii. the sum of the numbers on their upper faces is at the least 6.

i.  $n(S) = 36$

$n(A) = 10$

$\therefore P(A) = \underline{\hspace{1cm}}$

$= \frac{10}{36}$

$= \underline{\hspace{1cm}}$

ii.  $n(S) = 36$

$n(A) = 26/36$

$P(A) = \underline{\hspace{1cm}}$

$= \frac{26}{36}$

$= \underline{\hspace{1cm}}$

**Q. 2B) Answer the following.**

**8**

1. Determine nature of roots of the quadratic equations.  $x^2 + 2x - 9 = 0$

2. For certain simultaneous equations, if

(i)  $D = -5, D_x = 15, D_y = 10$

(ii)  $D = 4, D_x = 2, D_y = 8$

Find the values of  $x$  and  $y$ .

3. Prasad purchased a share of face value Rs. 100 when its market price was Rs. 150. Company declared a dividend of 12% on the share. What was the rate of return on the investment Prasad made ?

4. Find the sum of first  $n$  odd natural numbers.

**Q.3A) Answer the following. (Activity)(Any 1)**

**3**

1. Solve the following equations.  $(x^2 + x)(x^2 + x - 2) = 24(x^2 + x)(x^2 + x - 2) = 24$

Substituting  $x^2 + x = m$  we get

$$m(m - 2) = 24$$

$$\therefore m^2 - 2m - 24 = 0$$

$$\therefore \underline{\quad} = 0$$

$$\therefore m(m - 6) + 4(m - 6) = 0$$

$$\therefore (m - 6)(m + 4) = 0$$

$$\therefore m - 6 = 0 \text{ or } m + 4 = 0$$

$$\therefore \text{Substituting } m = \underline{\quad}$$

$$\therefore x^2 + x - 6 = 0 \quad \text{or } x^2 + x + 4 = 0$$

$$\therefore x^2 + x - 6 = 0 \dots(i) \quad \text{or } x^2 + x + 4 = 0 \dots(ii)$$

From (i)

$$\therefore \underline{\quad}$$

$$\therefore x(x + 3) - 2(x + 3) = 0$$

$$\therefore (x + 3)(x - 2) = 0$$

$$\therefore x + 3 = 0 \text{ or } x - 2 = 0$$

$$\therefore x = \underline{\quad} \text{ or } x = \underline{\quad}$$

From (ii)

$$x^2 + x + 4 = 0$$

$$0a=1, b=1, c=4$$

$$b^2 - 4ac = 1^2 - 4 \times 1 \times 4$$

$$= 1 - 16$$

$$= \underline{\quad} < 0$$

as  $b^2 - 4ac$  is negative, roots are not real so, discarded.

2. Pankajrao invested Rs.1,25,295 in shares of FV Rs. 10 when MV is Rs.125. Rate of brokerage is 0.2% and GST is 18%. Then find (i) How many shares were purchased.

(ii) the amount of brokerage paid

(iii) GST paid for the trading.

Sum invested = Rs. 1,25,295, brokerage = 0.2%, GST rate = 18%

Brokerage per share = \_\_\_\_\_ = Rs. 0.25.

GST per share on brokerage = 18% of 0.25 = \_\_\_\_\_

Cost of 1 share = \_\_\_\_\_

= 125 + 0.25 + 0.045

= Rs. 125.295.

No. of shares = = \_\_\_\_\_

Total brokerage = 0.25 1000 = \_\_\_\_\_

Total GST = 1000 0.045 = \_\_\_\_\_.

### Q.3B) Answer the following. (Any 2)

6

1. Three coins are tossed simultaneously. Find the probability of following events.

i. Getting exactly two heads.

ii. Getting at least two heads.

iii. Getting no head.

iv. Getting at the most two tails.

2. In an A.P. sum of three consecutive terms is 27 and their product is 504, find the terms.

- The sum of a two digit number and the number obtained by reversing its digits is 121. Find the number if its units place digit is greater than the tens place digit by 7.
- Draw a pie diagram to represent the world population of countries given in the following table after determining the value of

Country	India	China	Russia	USA	Other	Total
Percentage of population	15	20	a	a	25	100

**Q.4) Answer the following. (Any 2)**

**8**

- A frequency distribution table for the production of Mangoes of some farm owners is given below. Find the mean production of mangoes by 'assumed mean' method

Production (Thousand rupees)	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50
No. of farm owners	20	25	15	10	10

- The length (in meters) of the sides of a triangle are  $2x + \frac{y}{2}$ ,  $\frac{5x}{3} + y + \frac{1}{2}$ ,  $\frac{2}{3}x + 2y + \frac{5}{2}$ . If the triangle is equilateral, find its perimeter.
- Solve the following simultaneous equations using graphical method  
 $x + 3 = 2y$  ;  $2x + y = 14$

**Q.5) Answer the following. (Any 1)**

**3**

- A farmer wishes to grow a 100 m<sup>2</sup> rectangular vegetable garden. Since he has with him only 30 m barbed wire, he fences three sides of the rectangular garden letting compound wall of his house act as the fourth side fence. Find the dimensions of his garden.
- A missing helicopter is reported to have crashed somewhere in the rectangular region with dimension 9 × 4.5 km. There was a lake of dimension 3 × 2.5 km in one of the corner of the rectangular region.
  - Draw the figure to represent the above information.
  - Find the probability that the helicopter crashed inside the lake.

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