Seat No. | | | | | | | |

Nayak's Tutorials

Way to Excellence

Year: 2024-2025 | **Practice Paper-III** | **Marks: 40**

X (SSC) | **MATHEMATICS – ALGEBRA- PAPER -I** | **Duration: 2 Hr.**

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

1)

No. of trees planted by each student	1 - 3	4 - 6	7 - 9	10 - 12
No. of students	7	8	6	4

The above data is to be shown by a frequency polygon. The coordinates of the points to show number of students in the class 4 - 6 are ....

a. (4, 8) b. (3, 5) c. (5, 8) d. (8, 4)

2) The number of two-digit numbers which are divisible by 3 is

a. 34 b. 31 c. 30 d. 29

3) The NAV of a unit in mutual fund scheme is Rs. 10.65 then find the amount required to buy 500 such units.

a. 5325 b. 5235 c. 532500 d. 53250

4) If x = a, y = b is the solution of the equation x - y = 2 and x + y = 4, then the value of a and b are, respectively

a. 3 and 5 b. 5 and 3 c. 3 and 1 d. - 1 and - 3

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

1) How many possibilities are there in each of the following?
Any day of a week is to be selected randomly.

2) For the equation 4x + 5y = 20, find y when x = 0.

3) Smt. Deshpande purchased shares of FV Rs. 5 at a premium of Rs. 20. How many shares will she get for Rs. 20,000?

4) Write the following equations in the form $ax^2 + bx + c = 0$, then write the values of a, b, c for equation. p(3 + 6p) = -5.

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

1) If 2 and 5 are the roots of the quadratic equation, then complete the following activity to form quadratic equation:

Let α = 2 and β = 5 are the roots of the quadratic equation.

Then quadratic equation is:

$x^2 - (\alpha + \beta)\, x + \alpha\beta = 0$

$\therefore \quad x^2 - (2 + \_\_\_\_\_)\, x + \_\_\_\_\_ \times 5 = 0$

$\therefore \quad x^2 - \_\_\_\_\_ x + \_\_\_\_\_ = 0$

2) The first term and the common difference of an A.P. is 10 and 5 respectively. Complete the following activity to find the sum of first 30 terms of the A. P.

$\therefore \quad S_n = \frac{n}{2}[\_\_\_\_\_ + (n - a)d]$

$S_{30} = \frac{30}{2}[20 + (30 - 1) \times \_\_\_\_\_]$

$= 15\,[20 + \_\_\_\_\_]$

$= 15 \times 165$

$= \_\_\_\_\_$

3) Ajay purchased 500 shares of MV Rs. 50 Brokerage paid at the rate of 0.5% and rate of GST on brokerage is 18%. Find the total amount he paid for the share purchase.

Total MV = No. of shares $\times$ MV per share

$= 500 \times 50$

$=$ Rs. _____

Brokerage $= 0.5\% \times 25000$

$= \frac{0.5}{100} \times 25000$

$=$ _____

GST on Brokerage $= \frac{18}{100} \times 125$

$=$ _____

Total Amount Paid = Rs. 25,000 + 125 + 22.5

= Rs. _____

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

1) Mr. Mahajan purchased 100 shares, each of face value Rs. 100, when the market price was Rs. 45 per share, paying 2% brokerage. If the rate of GST on the brokerage is 18%, find the total amount he spent.

2) There are 15 tickets in a box, each bearing one of the numbers from 1 to 15. One ticket is drawn at random from the box. Find the probability of event that the ticket drawn - (1) shows an even number. (2) shows a number which is a multiple of 5.

3) Find the sum of first 11 positive numbers which are multiples of 6.

4) Solve the following simultaneous equations.
$3a + 5b = 26$; $a + 5b = 22$

5) Solve the following quadratic equation by factorization method.

$3x^2 - 2\sqrt{6}\,x + 2 = 0$

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

1) The product of ages of Pragati 2 years ago and 3 years after is 84. Find her present age.
Let the present age of Pragati be x years.
Pragati's age 2 years ago = _____ years and 3 years after = _____ years
According to given condition

_____

$\therefore \quad x(x + 3) - 2(x + 3) = 84$

$\therefore \quad$ _____ $= 84$

$\therefore \quad x^2 + x - 6 - 84 = 0$

$\therefore \quad x^2 + x - 90 = 0$

$\therefore \quad$ _____ $= 0$

$\therefore \quad x(x + 10) - 9(x + 10) = 0$

$\therefore \quad (x + 10)(x - 9) = 0$

$\therefore \quad x + 10 = 0$ or $x - 9 = 0$

$\therefore \quad x = -10$ or $x = 9$

Now age cannot be negative

$\therefore$ $x \neq -10$

$\therefore$ $x =$ _____

$\therefore$ The present age of Pragati is _____ years.

2) Find the sum of first 123 even natural numbers.

The first n even natural numbers are: 2, 4, 6, 8, ..., 2n
They form an A.P. with a = _____, t_n = _____

$\therefore$ S_n = _____

$= \frac{n}{2}[\ 2 + 2n\ ]$

$= \frac{n}{2} \times 2\ [\ 1 + n\ ]$

= _____

Now S_{123} = 123 $\times$ _____

$= 123 \times 124$

$\therefore$ S_{123} = _____

Thus, the sum of first 123 even natural numbers is _____

B) Solve the following questions. (Any two) **(6)**

1) 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.

2) A person has paid Rs. 15,075 for buying 100 shares. In that Rs. 75 is the brokerage. So the buyer has to pay 18% GST on Rs. 75. Let us find the amount of GST he paid to the broker and prepare the contract note. (Market Value = Rs. 150 Face Value = Rs. 100)

3) Solve the following quadratic equations by factorisation.
$2m(m - 24) = 50$

4) Find the median rainfall:

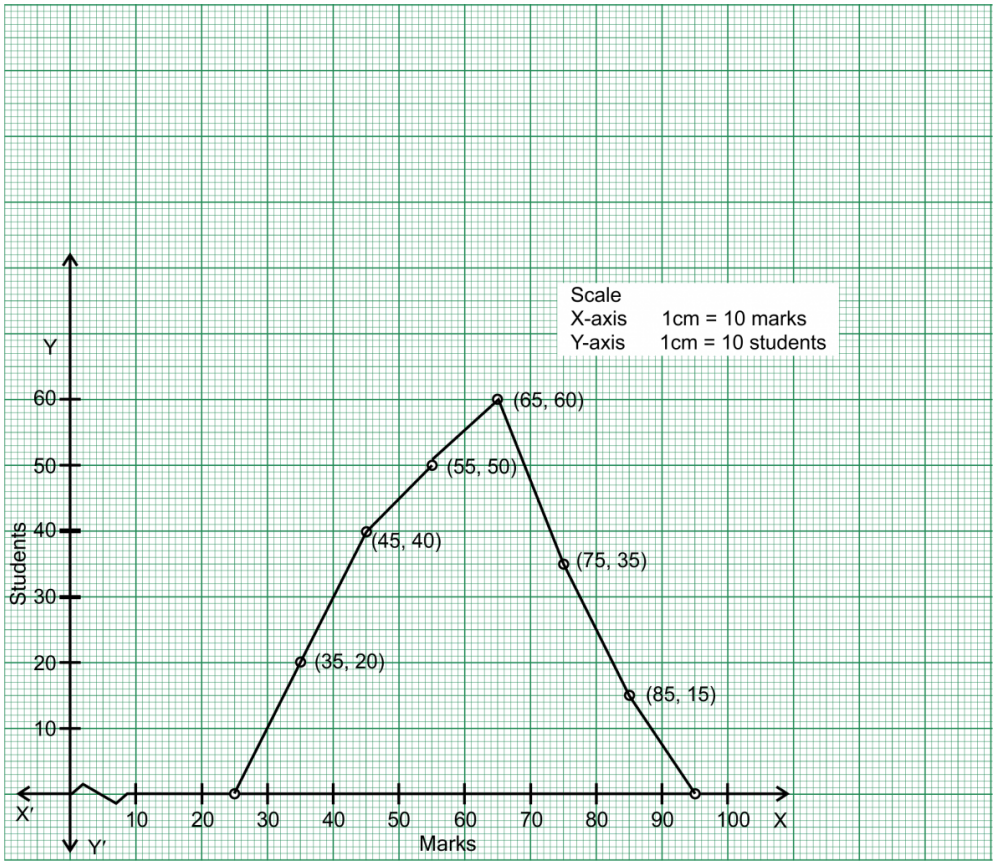
Rainfall (in mm)	100 - 150	150 - 200	200 - 250	250 - 300
Number of cities	4	8	12	6

Q.4 Solve the following questions. (Any two) **(8)**

1) Solve the following simultaneous equations graphically.
$x - 3y = 1$; $3x - 2y + 4 = 0$

2) If m times the m^{th} term of an A.P. is equal to n times n^{th} term then show that the (m + n) term of the A.P. is zero.

3) Observe the following frequency polygon and write the answers of the questions below it.

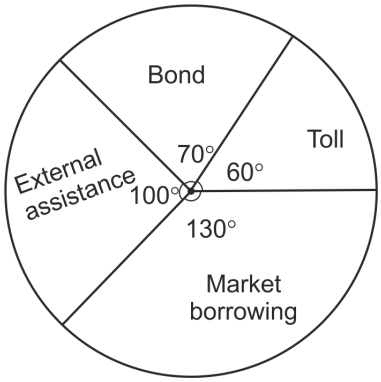


i. Which class has the maximum number of students?
ii. Write the classes having zero frequency.
iii. What is the class - mark of the class, having frequency fo 50 students?
iv. Write the lower and upper class limits of the class whose class mark is 85.
v. How many students are in the class 80 - 90 ?

Q.5 Solve the following questions. (Any one) **(3)**

1) Sum of 1 to n natural numbers is 36, then find the value of n.

2)



The pie diagram shows the sources of funds for the construction of 'National Highway X' project. The fund received through bonds is Rs. 11,200/- crores.

i. What is the total amount of the funds ?

ii. What amount is collected through 'Market borrowing'?

iii. What amount will the project get through 'External assistance'?