



BOYS' HIGH SCHOOL AND COLLEGE
FIRST TERM EXAMINATION (2025-26)
CLASS - X
MATHEMATICS

TIME 3:00 Hours

MM: 80

Note: Attempt All Questions from Section A and any Four Questions from Section B.

Section A (40 Marks)

(Attempt All Questions from this section)

Q.1 Choose the correct answer to the question from the given options. [15]

(Do not copy the questions, write the correct answer only)

(i) In a transaction from Delhi to Patna, MRP= Rs.10,000, discount =10%, GST =28%. Here IGST is :

- (a) Rs.2520 (b) Rs.5040 (c) Nil (d) Rs.1260

(ii) The value of k for which the quadratic equation,

$9x^2 - 3kx + k = 0$, has equal roots, are;

- (a) 0,1 (b) 0,2 (c) 2,4 (d) 0,4

(iii) For two polynomials f (x) and g(x), (x-a) and (x-b) are their respective factors. Which of the following is true?

- (a) $f(a) + g(b) = 1$ (b) $f(a) + g(b) = a - b$

- (c) $f(a) + g(b) = 0$ (c) $f(a) + g(b) = a + b$

(iv) If a matrix has 12 elements, then the total number of possible orders it can have is:

- (a) 4 (b) 6 (c) 8 (d) 10

(v) If x is a negative integer, then find the solution set of $3 + 2(x + 1) > -1$.

- (a) $\{-3, -2, -1\}$ (b) $\{-2, -1\}$ (c) $\{-1\}$ (d) $\{-4\}$

(vi) $T_n = 4 - 2n$ is the nth term of an A.P.

Assertion (A) : This AP will have all terms negative after 2nd term.

Reason (R) : The common difference is negative.

(a) A is true, R is false

(b) A is false, R is true

(c) Both A and R are true

(d) Both A and R are false.

(vii) The mean proportion between 0.02 and 0.32 is

- (a) 0.08 (b) 0.16 (c) 0.3 (b) 0.34

(viii) The Coordinates of the point (4, -7) when reflected in the x-axis followed by the reflection in the y-axis is:

- (a) (4, -7) (b) (-4, 7) (c) (4, 7) (d) (-4, -7)

(ix) The largest value of x for which, $3(x - 2) \leq 6 - x$, where $x \in W$ is:

- (a) 3 (b) 4 (c) 6 (d) none of these

(x) **Assertion (A) :** The point (-5, 0) lies on the x-axis.

Reason (R) : The y-coordinate of the point on x-axis is zero.

(a) A is true, R is false

(b) A is false, R is true

(c) Both A and R are true

(d) Both A and R are false.

(xi) If $\begin{bmatrix} m-2n & 5 \\ 3 & n \end{bmatrix} = \begin{bmatrix} 6 & 5 \\ 3 & -2 \end{bmatrix}$ then the value of mn:

- (a) 2 (b) 4 (c) -4 (d) -2

(xii) Mr. Gupta opened a Recurring Deposit account in a bank for 2 years. He deposits Rs.500 every month and receives Rs.25,500 on maturity. The interest he earned in 2 years is:

- (a) Rs.13500 (b) Rs.3000 (c) Rs.24000 (d) Rs.1500

(xiii) Which of the following points is invariant under reflection in the y-axis?

- (a) (14, 0) (b) (0, 8) (c) (-12, 3) (d) (4, -5)

(xiv) Jaspal possesses 600 shares of Rs.25 of a company. If the company announces a dividend of 8% then Jaspal's annual income is:

- (a) Rs.48 (b) Rs.480 (c) Rs.600 (d) Rs.1200

(xv) The common ratio of the Geometric Progression $\frac{1}{a^3x^3}, ax, a^5x^5, \dots$ is:

- (a) $\frac{1}{a^2x^3}$ (b) $\frac{1}{a^4x^4}$ (c) a^2x^2 (d) a^4x^4

Q.2 (a) A wholesaler buys a machine from the manufacturer for Rs.25000. He marks the price of the machine 20% above his cost price and sells it to a retailer at 10% discount on the marked price. If the rate of GST is 18% and assuming that all transactions occur within the same state, calculate.

(i) the marked price of the machine.

(ii) retailers cost price inclusive of GST

(iii) the CGST and SGST paid by the wholesaler to the government. [4]

(b) Arpit has a recurring deposit account of Rs.1000 per month at 10% per annum. If he gets Rs.5550 as interest at the time of maturity, find the number of instalments, he needs to pay. [4]

(c) If $x = \frac{2ab}{a+b}$, find the value of $\frac{x+a}{x-a} + \frac{x+b}{x-b}$ [4]

Q.3 (a) A shopkeeper purchases a certain number of books for Rs.960. If the cost per book was Rs.8 less, the number of books that could be purchased for the same amount would be 4 more. Write an equation taking the original cost of each book to be Rs.x and solve it to find the original cost of the book. [4]

(b) If $A = \begin{bmatrix} 2 & -6 \\ 2 & 0 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 2 \\ 4 & 0 \end{bmatrix}$, $C = \begin{bmatrix} 4 & 0 \\ 0 & 2 \end{bmatrix}$, find the matrix X such that

$$A+2X=2B+C$$

[4]

(c) Use graph sheet for this question. Take 2cm=1 unit along both the axis.

(i) Plot A (0, 3) B (2, 1) and C (4, -1)

(ii) Reflect point B and C in y-axis and name their images as B' and C' respectively. Plot and write coordinates of the points B' and C'.

(iii) Reflect point A in the line BB' and name its image as A'.

(iv) Plot and write coordinates of points A'.

(v) Join the points ABA'B' and give the geometrical name of the closed figure so formed. [5]

SECTION - B (40 Marks)

(Attempt any four questions from this section)

Q.4 (a) Kavita opened a recurring deposit account in a bank and deposited Rs.800 per month for $1\frac{1}{2}$ years. If she received Rs.15084 at the time of maturity, find the rate of interest per annum. [3]

(b) Solve the following inequation, write the solution set and represent it on the number line.

$$-3(x-7) \geq 15 - 7x > \frac{x+1}{3}, x \in \mathbb{R}$$

[3]

(c) Find x and y if $\begin{bmatrix} 3 & -2 \\ -1 & 4 \end{bmatrix} \begin{bmatrix} 2x \\ 1 \end{bmatrix} + 2 \begin{bmatrix} -4 \\ 5 \end{bmatrix} = 4 \begin{bmatrix} 2 \\ y \end{bmatrix}$ [4]

Q.5 (a) Mr. Prakash bought the following articles from a departmental store.

S.No.	Item	Price	Rate of GST	Discount
1	Medicine	Rs.1200	18%	Rs.100
2	Cashew Nut	Rs.600	12%	-

find the

(i) total GST paid.

(ii) total bill amount including GST. [3]

(b) Find the values of x which satisfy the inequation $2x-5 \leq 5x+4 < 11$, where $x \in \mathbb{I}$.

Represent the solution set on the number line [3]

(c) Given matrix $A = \begin{bmatrix} 4 \sin 30^\circ & \cos 0^\circ \\ \cos 0^\circ & 4 \sin 30^\circ \end{bmatrix}$

and $B = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$, if $AX=B$.

(i) write the order of matrix X.

(ii) find the matrix X.

[4]

Q.6 (a) The sum of the 5th and 9th terms of an AP is 30. If the 25th term is three times its 8th term. find the A.P.

[3]

(b) If a, b, c, d are in continued proportion, prove that $\frac{(a-b)^3}{(b-c)^3} = \frac{a}{d}$

[3]

(C) If the sum of the first two terms of a G.P. is -4 and the fifth term is 4 times the third term, find the G.P.

[4]

Q.7 (a) Anuj sold 400 (Rs.20) shares paying 5% at Rs.18 and invested the proceeds in (Rs.10) shares, paying 7% at Rs.12. How many (Rs.10) shares did he buy and what was the change in income?

[3]

(b) The first and the last term of a Geometrical Progression (G.P.) are 3 and 96 respectively. If the common ratio is 2, find

(i) 'n' the number of terms of the G.P.

(ii) Sum of the 'n' terms.

[3]

(c) If $x^3 - 2x^2 + ax + b$ has a factor $(x+2)$ and leaves a remainder 9 when divided by $(x+1)$, find the values of 'a' and 'b'. With these values of 'a' and 'b', factorise the given polynomial completely.

[4]

Q.8 (a) Find the sum of all 2 digit numbers which are divisible by 3.

[3]

(b) The line segment joining A (2, 3) and B (6, -5) is intersected by the x-axis at the point K. Find the ratio in which K divides AB. Also, write the coordinates of the point K.

[3]

(c) Using the remainder and factor theorem, factorise the polynomial

$$x^3 + 10x^2 - 37x + 26$$

[4]

Q.9 (a) Solve the equation $2x^2 - 7x - 1 = 0$. Write your answer correct to two decimal places.

[3]

(b) When divided by $(x-3)$, the polynomials

$x^3 - px^2 + x + 6$ and $2x^3 - x^2 - (p+3)x - 6$ leave the same remainder, find the value of p. Also find the remainder in each case.

[3]

(c) 200 logs are stacked in such a way that there are 20 logs in the bottom row, 19 logs in the next row, 18 logs in the next row and so on. How many rows are formed and how many logs are there in the top row?

[4]

Q.10 (a) Tejinder has a choice to invest in shares of two companies A and B. Rs100 shares of company A are available at 10% premium and it pays 8% dividend whereas Rs.50 shares of company B are available at 12% discount and it pays 7% dividend. If he invests equally in both the companies and the sum of his annual incomes from them is Rs.1340, find

(i) his annual income from company B

(ii) number of shares he purchases for company A

(iii) his total invest in both the companies.

[5]

(b) A boat can cover 10 km up the stream and 5 km down the stream in 6 hours. If the speed of the stream is 1.5 km/h, find the speed of the boat in still water.

[5]

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