DIOCESAN BOARD OF EDUCATION
SECOND TERM EXAMINATION 2025-2026
STANDARD - X
SUBJECT - MATHEMATICS

TIME: 3 HRS. **M.M:80**

Note: Attempt all questions from Section-A and any four questions from Section-B.

SECTION - A

(Attempt all questions from here) **[1x15 = 15]**

Question 1:-

Choose the correct answers to the questions from given options.

(Write down correct answers only)

1. **The equation of the line passing through origin and parallel to the line $3x + 4y + 7 = 0$ is**

   a) $3x + 4y + 5 = 0$ b) $4x - 3y - 5 = 0$

   c) $4x - 3y = 0$ d) $3x + 4y = 0$

2. **A man invested in a company paying 12% dividend on its share. If the percentage return on his investment is 10% then the shares are:-**

   a) At Par b) Below Par

   c) Above Par d) Cannot be determine

3. **Assertion (A): If $\sin^2 A + \sin A = 1$ then $\cos^4 A + \cos^2 A = 1$**

   Reason (R) : $1 - \sin^2 A = \cos^2 A$

   a) (A) is true, (R) is false

b) (A) is false, (R) is true

c) Both (A) and (R) are true, (R) is the correct reason for (A)

d) Both (A) and (R) are true, (R) is the incorrect reason for (A)

4. If the volume of two spheres is in the ratio 27:64 then the ratio of their radii is

a) 3:4 b) 4:3

c) 9:16 d) 16:9

5. The marked price of an article is Rs 1375. If the CGST is charged at a rate of 4% then the price of the article including GST is

a) Rs 55 b) Rs110

c) Rs 1430 d) Rs 1485

6. The sum of first 16 terms of the AP 10, 6, 2, -2, ...is

a) -320 b) 320

c) -350 d) -300

7. The 8th term of the G.P $\frac{3}{4}, \frac{3}{2}, 3, \ldots$ is

a) 69 b) 54

c) 96 d) 49

8. A(1,4) , B (4,1) and C (x,4) are the vertices of Δ ABC. If the centroid of the triangle is G (4, 3) then x is equal to

a) 2 b) 1

c) 7 d) 4

9. The sum invested to purchase 15 shares of a company of nominal value Rs75 available at a discount of 20%

a) Rs 60 b) Rs 90

10. In what ratio does the Y - axis divide the line segment joining the points P(-4,5) and Q (3,-7)

a) 4:3 b) 3:4

c) 3:1 d) none of these

11. Assertion(A):-If $\Delta ABC \sim \Delta DEF$ then $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

Reason(R):- Both triangles have same shape and same size

a) A is true. R is false b) Both A and R are true

c) A is false. R is true d) Both A and R are false

12. The lines represented by $4x + 3y = 9$ and $kx - 6y + 3 = 0$ are parallel. The value of K is

a) $-\frac{2}{3}$ b) $\frac{2}{3}$

c) $\frac{3}{2}$ d) none of these

13. The printed price of an article is Rs3080. If the rate of GST is 10% find GST charged is

a) Rs 154 b) Rs 308

c) Rs 30.80 d) Rs 15.40

14. The sum of money required to buy 50, Rs 40 shares at Rs 38.50 is

a) Rs 1920 b) Rs 1924

c) Rs 1925 d) Rs1952

15. A solid cone of radius 5cm and height 8cm is melted and made into small spheres of radius 0.5cm then how many spheres are formed.

a) 40 b) 400

c) 800 d) none of these

Q2. A man bought Rs 200 shares of a company at 25% premium. If he received a return of 5% on his investment. Find the

a) Market Value

b) Dividend percent declared.

c) Number of shares purchased if annual dividend is Rs 1000 **[4]**

ii. A bus covers a distance of 240km at a uniform speed. Due to heavy rain its speed gets reduced by 10km/h and as such it takes two hours longer to cover the total distance. Assuming the uniform speed to be x km/h from an equation and solve it to evaluate x. [4]

iii. The fourth, the seventh term and the last term of a geometrical progression are 10, 80 and 2560 respectively. Find its

a) First term b) Common ratio

c) Number of terms **[4]**

Q3. i. On a map drawn to a scale of 1:40000 a rectangular plot of land ABCD has the following measurements: AB = 6cm and BC = 8cm. Calculate

a) The diagonal distance of the plot in km.

b) The area of the plot in sq.km [5]

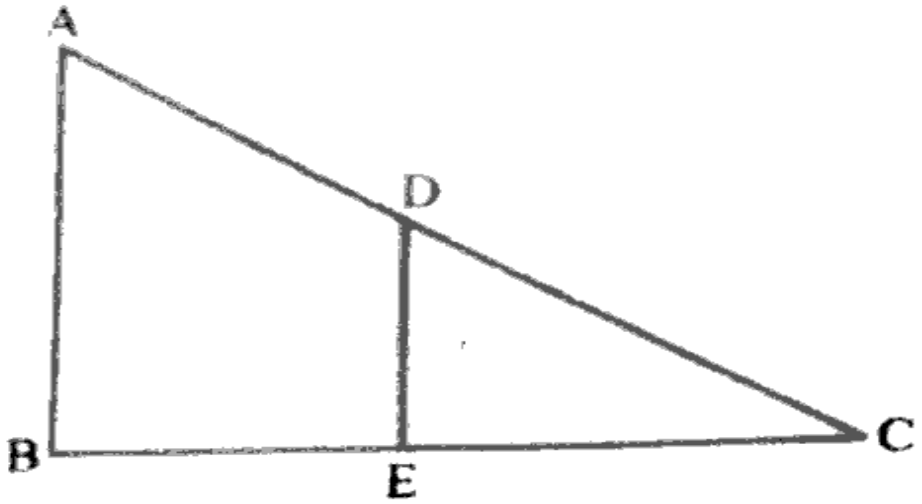
ii. Find the equation of the line that is parallel to $2x+5y-7=0$ and passes through the mid-point of the line segment joining the points (2,7) and (-4,1) **[4]**

iii. Prove that:- $\frac{\cos A}{1-\tan A}+\frac{\sin A}{1-\cot A}=\sin A+\cos A$ **[4]**

SECTION – B

(Attempt any four questions from this section)

Q4 i. In the given figure, AB and DE are perpendicular to BC **[4]**



a. Prove the $\Delta ABC \sim \Delta DEC$

b. $AB = 6cm$, $DE = 4cm$, $AC = 15cm$ find CD

c. Find the ratio of the area of ΔABC: area of ΔDEC

ii. Rohan bought the following eatables from his friends.

S.No	Item	Price	Quantity	Rate of GST
1	Laddu	Rs 500 per kg	2kg	5%
2	Pastries	Rs 100 per piece	12 pieces	18%

Find: a) Total GST paid

b) Total bill amount including GST **[3]**

iii. Mr Gupta invested Rs 33000 in buying Rs 100 shares of a company at 10% premium. The dividend declared by the company is 12%. Find:-

a) No. of shares purchased by him

b) His annual dividend **[3]**

Q5 i. In an arithmetic progression the 4^{th} and 6^{th} terms are 8 and 14 respectively. Find the

a) First term

b) Common difference

c) Sum of the first 20 terms [4]

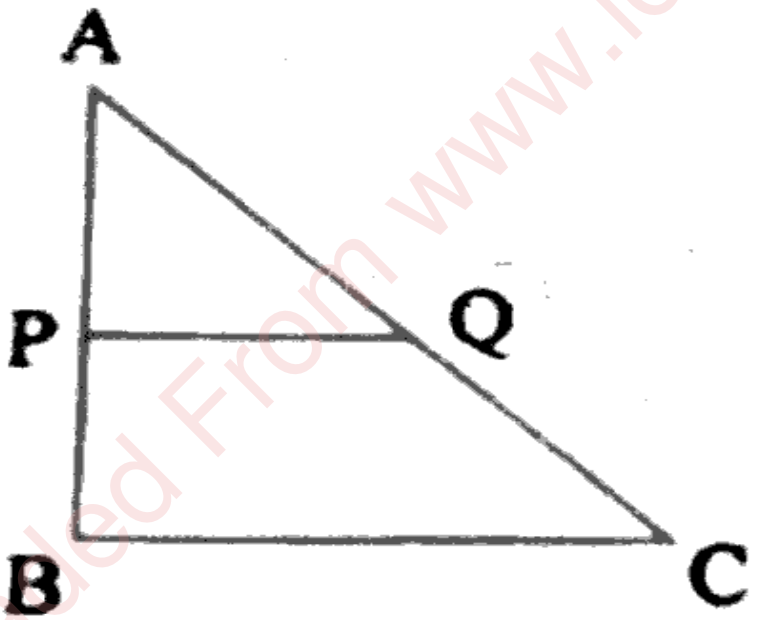
ii. Find the co-ordinates of the points of trisection of the line segment joining the point A(2, 1) and B(5, -8). [3]

iii. A certain number of metallic cones each of radius 2cm and height 3cm are melted and recast into a solid sphere of radius 6cm. Find the number of cones. [3]

Q6. i. Prove that $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \text{cosec}\,\theta + \cot\theta$ [3]

ii. In the figure If PQ || BC. AP = 3cm, BP = 4cm, BC = 5cm. Find [3]

a) AQ:QC b) PQ



iii. Find the equation of a line parallel to the line $2x + y - 7 = 0$ and passing through the intersection of the

Q7. i. The difference of two natural numbers is 7 and their product is 450. Find the numbers. [3]

ii. Calculate the ratio in which the line joining A(-4,2), B(3,6) is divided by point P (x,3). Find:-

a) x b) length of AP [3]

iii. The total surface area of a cylinder is $462 cm^2$. If its curved surface area is one-third of its surface area. Find the volume of the cylinder. [4]

Q8. i. A man buys 250, ten-rupee shares each at ₹12.50. If the rate of dividend is 7%. Find the

a) Dividend he receives annually

b) Percentage return on his investment [3]

ii. An A.P has 3 as its first term. The sum of the first 8 terms is twice the sum of the first 5 terms. Find the common difference of the A.P [3]

iii. Five years ago, a woman's age was the square of her son's age. Ten years hence her age will be twice that of her son's age. Find

a) The age of the son five year ago

b) The present age of the woman [4]

Q9. i. The 2nd and 5th terms of a G.P are $-\frac{1}{2}$ and $-\frac{1}{16}$ respectively. Find the sum of the first 8 terms of the G.P. [3]

ii. ABCD is a parallelogram where A (x,y) B (5,8) C (4,7) and D(2,-4). Find

a) Co-ordinates of A

b) The equation of the diagonal BD [3]

iii. A model of a ship is made to a scale of 1:250. Find

a) The length of the ship, if the length of the model is 1.6m

b) The area of the deck of the ship, if the area of the deck of model is $2.4m^2$

c) The volume of the model. If the volume of the ship is $1km^3$ [4]

Q10. i. A circus tent is cylindrical to a height of 8m surmounted by a conical part. If total height of the tent is 13m and the diameter of its base is 24m. Find

a) Total surface area of the tent

b) Area of the canvas required to make this tent allowing 10% of the canvas used for folds and stitching. **[6]**

ii. A dealer buys an article for ₹ 6000 from a wholesaler. The dealer sells the article to a consumer at 15% profit. If the sale are intra state and the rate of GST is 18%. Find:-

a) Input CGST and input SGST paid by the dealer.

b) Output CGST and output SGST collected by the dealer.

c) The net CGST and SGST paid by the dealer.

d) Total amount paid by the consumer **[4]**