Sub:- Mathematics | **Annual Examination – 2024-25** | **Time: 3 hours**
Class: IX | **F.M: 80**

SECTION-A (40 marks)
Attempt all questions

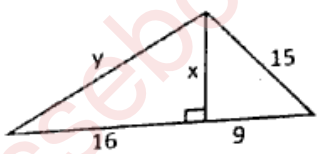
Question 1: Choose the correct answers to the questions from the given options: **[15]**

I. If $x^2 + \frac{1}{x^2} = 18$, then $x - \frac{1}{x}$ is
(a) 16 (b) -16 (c) ± 9 (d) ±4

II. $(sin60° + cos60°)(cos30° - sin30°) = ?$
(a) 0 (b) 1/2 (c) 3/4 (d) 1

III. Perimeter of a rhombus is 80 cm, one diagonal is 24 cm. The other diagonal is _____
(a) 30 cm (b) 16 cm (c) 32 cm (d) 26 cm

IV. **Assertion(A):** A triangle with sides 3.2 cm, 4.8 cm and 8 cm can be constructed.
Reason(R): Sum of two sides of a triangle is greater than the third side.
(a) Both A and R are true & R is correct reason for A.
(b) Both A and R are true & R is incorrect reason for A.
(c) A is true but R is false.
(d) A is false but R is true.



V. In the given figure, measures of x and y are
(a) x = 10, y = 17 (b) x = 12, y = 20 (c) x = 20, y = 25 (d) x = 13, y = 18

VI. If the mean age of 20 students is15 years and the mean age of another group of 10 students is 12 years, then the mean age of 30 students is :-
(a) 13.5 years (b) 12.5 years (c) 13 years (d) 14 years

VII. If sum of two numbers is 35 and their difference is 15, then their product is :-
(a) 200 (b) 250 (c) 150 (d) 300

VIII. $4x^2 - 36 = ?$
(a) $(2x-6)^2$ (b) $4(x-6)(x+6)$ (c) $2(x+9)(x-9)$ (d) $4(x+3)(x-3)$

IX. Area of a triangle is 54 cm^2. If its base is 18 cm, the corresponding height is :-
(a) 3 cm (b) 6 cm (c) 4.5 cm (d) 8 cm

X. $log\ 6 = ?$
(a) $log\ 2 \times log\ 3$ (b) $log\ 3 \times log\ 3$ (c) $log 3 + log\ 3$ (d) $log\ 2 + log\ 3$

XI. In a right – angled $\Delta ABC, \angle C = 42°$ and $\angle B = 90°$. The smallest side of the triangle is:
(a) AC (b) BC (c) AB (d) insufficient data

XII. If point P(–1,a) lies on line 2x + 3y = 10 ; then a = ?
(a) 3 (b) –2 (c) 4 (d) 8/3

XIII. The volume of a cuboid is 448 cm^3. Its height is 7 cm and base is a square. The length of side of the square is:-
(a) 16 cm (b) 10 cm (c) 8 cm (d) 6 cm

XIV. If $2^{x-3} = \frac{1}{32}$, then $x = ?$
(a) 2 (b) 3 (c) 5 (d) –2

XV. Area of triangle ABC with sides 6 cm, 8 cm and 10 cm is :-
(a) 24 cm^2 (b) 30 cm^2 (c) 40 cm^2 (d) 48 cm^2

Question 2: (a) ABCD is a rectangle, AB = 10 cm and AD = 7 cm. Two semicircles are described on sides AD and BC as diameters. Find the area of the shaded region. [Use $\pi = \frac{22}{7}$] [4]

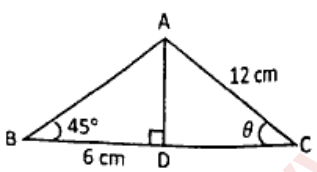
(b) Find the altitude and area of an isosceles triangle whose perimeter is 80 cm and whose base is 30 cm. [4]

(c) A machine costing Rs.80,000 depreciates at a certain rate every year. Its value after 2 years is Rs.57,800. Find the rate of depreciation. [4]

Question 3: (a) Draw a frequency polygon for the following table on a graph paper. [4]

Daily wages	80 - 90	90-100	100 - 110	110 - 120	120 -130
No. of workers	6	17	23	36	8

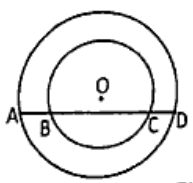
(b) In the given figure, AD ⊥ BC, $\angle B = 45°$. Find θ and CD. [Use $\sqrt{3} = 1.73$] [4]



(c) Draw the graph of $x - 2y + 4 = 0$ *and* $4x - y = 5$. Use 1cm = 1 unit on both the axes and plot three points per line. Find :
(i) the coordinates of the point of intersection of the two lines.
(ii) the area of the triangle formed by the lines and the y-axis. [5]

SECTION-B (40 MARKS)
Attempt any four questions

Question 4:(a) The radii of two concentric circles are 15 cm and 13 cm. A line ABCD cuts outer circle at A and D and inner circle at B and C. If BC = 10 cm, find the length of AB. [3]



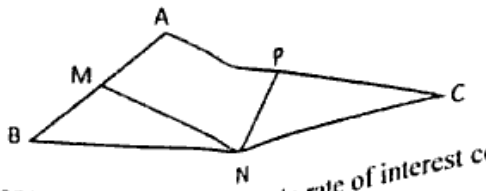
(b) A is a point on x-axis with abscissa 4 and B(–8,16). Find the distance between A and B. [3]

(c) If $a - b = 6$ and $ab = 16$; find the value of :- [4]
(i) $a + b$ (ii) $a^2 - b^2$ (iii) $a^3 + b^3$

Question 5:(a) Solve the following pair of equations by **cross-multiplication** method: [3]
$3x - 2y = 9$; $2x - y = 5$

(b) Without using trigonometric tables, evaluate : [3]
$sin50°sec40° + cos44°cosec46° - \sqrt{2}cos45° + tan^2 60°$

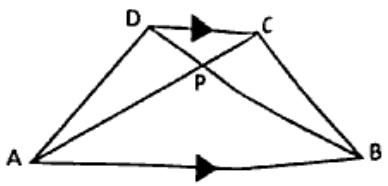
(c) M, N and P are mid-points of sides AB, BC and AC of ΔABC. Prove that AMNP is a parallelogram. [4]



Question 6: (a) Ayush invests Rs.15000 for 2 years at a certain rate of interest compounded annually. At the end of 1 year it amounts to Rs.16200. Calculate : [3]
(i) the rate of interest. (ii) the amount at the end of IInd year.

(b) Simplify: $\left(\frac{9}{16}\right)^{\frac{-1}{2}} - 2(27)^{\frac{1}{3}} + \left(\frac{1}{4}\right)^{-2}$ [3]

(c) In the given figure, AD = BC and AC = BD. Prove that ΔPAB is isosceles. [4]



Question 7: (a) Factorise : $x^3 - 3x^2 - x + 3$ [3]

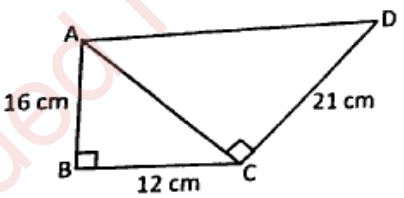
(b) If $12sin\theta = 5cos\theta$, find the value of $2cos\theta + 3sin\theta$ [3]

(c) The present ages of a mother and her son are x and y years. Four years hence, mother will be 4 times her son's age. 3 years ago, she was 11 times her son's age. Find their present ages. [4]

Question 8: (a) Solve for 'm' : $\frac{5^m X 25^{m+1}}{5^{m-1} X 125^{m-1}} = 625$ [3]

(b) Three cubes are kept adjacently, edge to edge. If the edge of each cube is 7 cm, find total surface area and volume of the resulting cuboid. [3]

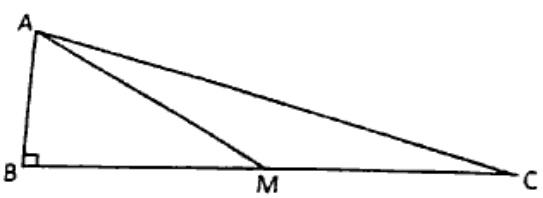
(c) In the given fig. ABCD, $\angle ABC = 90°$ *and* $DC \perp AC$. Find: [4]
(i) the length of AC (ii) the area of fig. ABCD (iii) the perimeter of fig. ABCD



Question 9: (a)Evaluate : $3log2 + \frac{1}{3}log27 + log12 - log4 + 3log5$ [3]

(b) Construct a parallelogram ABCD, in which diagonal AC = 7 cm, diagonal BD = 5.5 cm and the angle between the diagonals is 45° [3]

(c) *In* ΔABC, *M is mid-point of* BC and $\angle B = 90°$. Prove that $BC^2 = 4(AM^2 - AB^2)$ [4]



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