GRADE - IX
TIME : 3 HOURS

ASSESSMENT II (2024-25)

MATHEMATICS
M.M. 80

Attempt ***all*** *questions from* ***Section A*** *and* ***any four*** *questions from* ***Section B.***

All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.

Omission of essential working will result in loss of marks.

The intended marks for questions or parts of questions are given in brackets [ ].

SECTION A (40 Marks)

(*Attempt* ***all*** *questions from this Section*)

Question.1 : Choose the correct answer from the given four options. [15]

i) The number obtained on rationalizing the denominator of $\frac{1}{\sqrt{7}-2}$ is.

a) $\frac{\sqrt{7}+2}{3}$ b) $\frac{\sqrt{7}-2}{3}$ c) $\frac{\sqrt{7}+2}{5}$ d) $\frac{\sqrt{7}+2}{45}$

ii) The factorisation of $3x^2 + 7x - 6$ *is,*

a) (3x – 2) (x + 3) b) (3x + 2) (x - 3) c) (3x – 2) (x - 3) d) (3x + 2) (x + 3)

iii) The value of $\frac{\log 8 - \log 2}{\log 32}$ is .

a) $\frac{2}{5}$ b) $\frac{1}{4}$ c) $\frac{1}{3}$ d) $\frac{-2}{5}$

iv) If the total surface area of a cube is 96 sq. cm, then the volume of the cube is,

a) 8 cu. cm b) 512 cu. cm c) 64 cu. cm d) 27 cu. Cm

v) Which of the following is equal to x ?

a) $x^{\frac{12}{7}} - x^{\frac{5}{7}}$ b) $\sqrt[12]{(x^4)^{\frac{1}{3}}}$ c) $(\sqrt{x^3})^{\frac{2}{3}}$ d) $x^{\frac{12}{7}} X\ x^{\frac{7}{12}}$

vi) In ΔABC, AB = AC and $\angle B = 50°$. Then $\angle C$ is equal to ,

a) 40° b) 50° c) 80° d) 130°

vii) In ΔABC, AB = 3 cm, BC = 4 cm and CA = 5 cm. If D and E are mid-points of AB and BC respectively, then the length of DE is,

(a) 1.5 cm (b) 2 cm (c) 2.5 cm (d) 3.5 cm

viii) The distance between the points (4, p) and (1, 0) is 5 units, then the value of p is,

a) 4 only b) - 4 only c) 0 d) ±4

ix) The points whose abscissa and ordinate have different signs will lie in ,

a) I and II quadrants b) II and III quadrants c) I and III quadrants d) II and IV quadrants

x) The value of $\frac{1-\tan^2 45°}{1+\tan^2 45°}$ is equal to ,

a) tan 60° b) tan 30° c) sin 45° d) tan 0°

xi) Which of the following is not true for parallelogram ?

a) opposite sides are equal. b) opposite angles are equal. c) opposite angles are bisected by the diagonals d) diagonals bisect each other.

xii) AD is a diameter of a circle and AB is a chord. If AD = 34 cm and AB = 30 cm.then the distance of AB from the centre of circle .

a) 17 cm b) 15cm c) 4 cm d) 8 cm

xiii) The distance of the point p(2 , 3) from x – axis is .

a) 2 units b) 3 units c)1 units d) 5 units

xiv) The decimal expansion of the rational number $\frac{33}{2^2 X\ 5}$ will terminate after .

a) one decimal place b) two decimal place c) three decimal place d) four decimal place

xv) **Assertion (A)** : For Δ ABC, a line segment EF is drawn such that E is the mid point of AB and F is the mid point of AC. Then the quadrilateral formed EFCB is a trapezium.

Reason (R) : The line segment joining the mid – points of two sides of a triangle is parallel to the third side.

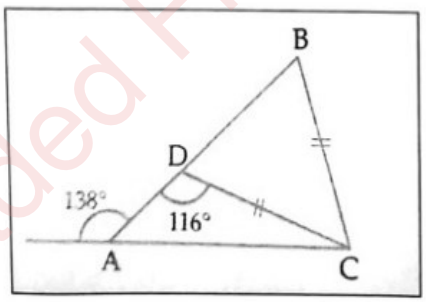
a) A is true but R is false b) A is false but R is true c) Both A and R , are true and R is the correct explanation of A. d) Both A and R , are true but R is not correct explanation of A.

Question : 2

a) Find a and b if : $\frac{7+\sqrt{5}}{7-\sqrt{5}} - \frac{7-\sqrt{5}}{7+\sqrt{5}} = a + \frac{7}{11}b\sqrt{5}$. **[4]**

b) If Q (0, 1) is equidistant from P (5, -3) and R (x, 6), find the value of x. **[4]**

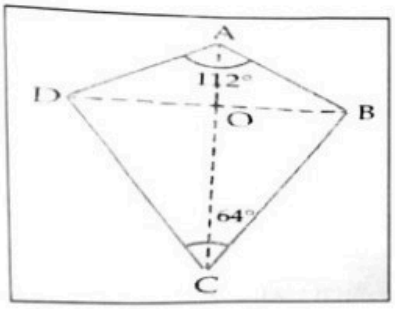
c) In the given figure , BC = CD. Find $\angle ACB$. **[4]**



Question : 3

a) Simplify : $(\frac{8}{27})^{\frac{-1}{3}} \times (\frac{25}{4})^{\frac{1}{2}} \times \left(\frac{4}{9}\right)^{0} \times (\frac{125}{64})^{\frac{1}{3}}$ **[4]**

b) In the figure given below, ABCD is a kite and diagonals intersect at O. If $\angle DAB = 112^0$ *and* $\angle DCB = 64^0$, *find* $\angle ODC$ *and* $\angle OBA$.



c) Draw frequency polygon for the following data : [5]

Class intervals	40 - 50	50 - 60	60 - 70	70 - 80	80 - 90	90 - 100
Frequency	15	28	45	32	41	18

SECTION *B (40 Marks)*

(*Attempt **any four questions** from this Section*)

Question : 4

a) Evaluate : $2 \log 10^3 + 3 \log 10^{-2} - \frac{1}{3}\log 5^{-3} + \frac{1}{2}\log 4$ [3]

b) Factorise the following :- i) $7\sqrt{2}x^2 - 10x - 4\sqrt{2}$. ii) $6x^2 + 17x + 5$. [3]

c) Using riler and compasses only , construct the quadrilateral ABCD in which $\angle BAD = 45^0$, BC = 3.6 cm, AD = AB = 6 cm, CD = 5 cm. Measure $\angle BCD$. [4]

Question : 5

a) $\left(\frac{64}{125}\right)^{-\frac{2}{3}} \div \frac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}} + \left(\frac{\sqrt{25}}{\sqrt[3]{64}}\right)^0$ [3]

b) Prove that $\frac{\tan\theta}{\tan(90°-\theta)} + \frac{\sin(90°-\theta)}{\cos\theta} = sec^2\theta$ [3]

c) Solve :- $\frac{x+3}{x-1} = \frac{2x+1}{3x-5}$. [4]

Question : 6

a) A chord of length 16 cm is at a distance of 6 cm from the centre of the circle. Find the length of the chord of the same circle which is at distance 8 cm from the centre. [3]

b) Prove that $log_{10}4 \div log_{10}2 = log_3 9$ [3]

c) Given below are the marks secured by 35 students in a test :
41, 32, 35, 21, 11, 47, 42, 00, 05, 18, 25, 24, 29, 38, 30, 04, 14, 24, 34, 44, 48, 33, 36, 38, 41, 46, 08, 34, 39, 11, 13, 27, 26 , 43, 03. Taking class intervals 0-10, 10-20, 20-30,….., construct frequency as well as cumulative frequency distribution table. Find the number of students obtaining below 20 marks. [4]

Question : 7

a) Solve the following equation : (i) $x^2 - 2x = 48$, (ii) $3x - \frac{8}{x} = 2$ [3]

b) If $5 \sin\theta = 3$, *find the value of* $\frac{\sec\theta - \tan\theta}{\sec\theta + \tan\theta}$ [3]

c) If the numerator of a certain fraction is increased by 2 and the denominator by 1, the fraction becomes equal to $\frac{5}{8}$ and if the numerator and denominator are each diminished by 1, the fraction becomes equal to $\frac{1}{2}$, find the fraction. **[4]**

Question : 8

a) If $x^4\ y^2\ z^3 = 49392$, find the values of x, y and z where x, y and z are different positive primes. **[3]**

b) If D,E and F are midpoints of the sides AB, BC and CA respectively of an isosceles $\Delta\ ABC$. Prove that $\Delta\ DEF$ is also isosceles

c) Factorise: (i) $18p^2q^2 - 24pq^2 + 30p^2q$ (ii) $4a^2 - 9b^2 - 16c^2 + 24bc$

Question : 9

a) Rationalise the denominator of $\frac{7 + 3\sqrt{5}}{7 - 3\sqrt{5}}$. **[3]**

b) By using distance formula , show that the points (4, 2) , (7, 5) and (9, 7) are collinear. **[3]**

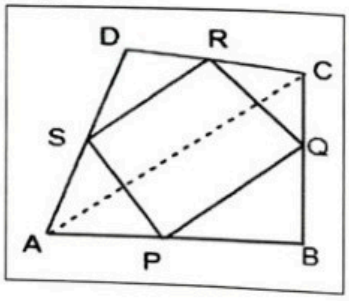
c) In the following figure, AB and CD are two diameter of a circlewith centre O perpendicular to each other and OD is diameter of the smaller circle. If OA = 7 cm , find the area of the shaded region. **[4]**

Question : 10

a) Solve by elimination method : $\frac{3}{x} + 4y = 7,\quad \frac{5}{x} + 6y = 13$ **[3]**

b) A chord of length 16 cm is at a distance of 6 cm from the centre of the circle. Find the length of the chord of the same circle which is at distance 8 cm from the centre. **[3]**

c) In the adjoining figure ABCD is a quadrilateral in which P,Q,R and S are midpoints of AB,BC,CD and DA respectively. AC is its diagonal. **[6]**



Show that (i) $SR \parallel AC$ and $SR = \frac{1}{2}AC$ (ii) $PQ = SR$ (iii) PQRS is a parallelogram