FINAL EXAMINATION: 2024-2025

CLASS : IX

SUBJECT : MATHEMATICS

NAME OF STUDENT:.....

MAX. MARKS: 80

DATE: .....

TIME: 3 HOURS

NOTE: You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper. The time given at the head of this paper is the time allowed for writing the answers. Attempt all questions from Section A and any four questions from Section B.

Section: A [40marks]

(Attempt all questions from this Section)

Q1. Choose the correct answer to the questions from the given options: [15]

(i) $2\sqrt{3} + \sqrt{3}$

(a) $2\sqrt{6}$ (b) 6

(c) $3\sqrt{3}$ (d) $4\sqrt{6}$

(ii) The compound interest on Rs 1000 at 10% p.a. compounded annually for 2 years is

(a)Rs 190 (b) Rs 200

(c) Rs 210 (d) Rs 1210

(iii) If $x + y = 11$ and $xy = 24$, then $x^2 + y^2$ is equal to

(a)121 (b)73

(c) 48 (d) 169

(iv) Factorization of $p^4 - 81$

(a)$(p^2-9)(p^2 + 9)$ (b) $(p-3)(p+3)(p^2+9)$

(c) $(p-3)^2 (p+3)^2$ (d) none of these

(v) The product of $\sqrt[3]{2}\ \sqrt[4]{2}\ \sqrt[12]{32}$

(a)$\sqrt{2}$ (b) 2

(c)$\sqrt[12]{2}$ (d)$\sqrt[12]{32}$

(vi) The value of $2 + \log_{10}(0.01)$ is

(a)4 (b)3

(c)1 (d)0

(vii) In ΔPQR, $\angle R = \angle P$, QR = 4cm and PR = 5cm. Then the length of PQ is

(a)4cm (b) 5cm

(c) 2cm (d) 2.5cm

(viii) In a ΔABC, AB= 3cm, BC= 4cm and CA= 5cm. If D and E are midpoints of AB and BC respectively, Then the length of DE is

(a)1.5cm (b) 2cm

(c) 2.5cm (d) 3.5cm

(ix) If the sides of a rectangular plot are 15m and 8m, then the length of its diagonal is

(a)17m (b) 23m

(c) 21m (d) 18m

(x) The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O.If $\angle DAC = 32^0$ and $\angle AOB = 70^0$, then $\angle DBC$ is equal to

(a)24^0 (b)86^0

(c)38^0 (d)32^0

(xi) A median of a triangle divides it into two

(a)triangles of equal area (b) scalene triangle

(c)right triangles (d)isosceles triangles

(xii) If P is a point in the interior of a circle with center O and radius r, then

(a)OP =r (b)OP > r

(c)OP ≥ r (d) OP< r

(xiii) Assertion(A): If in a ΔABC, we have AB= $4\sqrt{3}$ cm, BC = 4cm and AC = 8cm, then ∠B =90^0.

Reason(R): Converse of Pythagoras theorem states that in a triangle, if square of one side is equal to the sum of squares of other two sides, then the angle opposite to the longest side is a right angle.

(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

(xiv)If tanA = $\sqrt{3}$, then the value of cosecA is

(a)$\frac{1}{2}$ (b) 2

(c) $\frac{2}{\sqrt{3}}$ (d) $\frac{\sqrt{3}}{2}$

(xv)The points (-5,2) and (2,-5) lie in

(a)same quadrant (b) II and III quadrants respectively

(c) II and IV quadrants respectively (d) IV and II quadrants respectively

Q2.(i)The length, breadth and height of rectangular solid are in the ratio 5: 4: 2. If the total surface area is 1216cm^2, find the length, breadth and height of the solid. Also find the length of a diagonal of the cuboid. [4]

(ii)Prove the following:

$$\frac{cos\theta}{\sin(90^0-\theta)} + \frac{sin\theta}{\cos(90^0-\theta)} = 2$$ [4]

(iii)Find the point on the x-axis which is equidistant from the points (2,-5) and (-2,9). [4]

Q3.(i) Solve 2x + y = 35, 3x + 4y = 65. Hence, find the value of $\frac{x}{y}$. [4]

(ii) In ΔABC , AB = AC, ∠A = $(5x + 20)^0$ and each of the base angle is $\frac{2}{5}$th of ∠A. Find the measure of ∠A. [4]

(iii) A triangle is formed by the lines x + 2y – 3 = 0, 3x – 2y + 7 = 0 and y + 1 = 0. Find graphically [5]

(i)the coordinates of the vertices of the triangle.

(ii)the area of the triangle

Section B [40 marks]

(Attempt any four questions from this Section.)

Q4.(i)How much will Rs 25000 amount in 2 years, at compound interest, if the rates for the successive years are 4% and 5% per year? [3]

(ii) If a – b = 3 and ab = 4, find $a^3 - b^3$. [3]

(iii) If a = $\frac{2-\sqrt{5}}{2+\sqrt{5}}$ and b = $\frac{2+\sqrt{5}}{2-\sqrt{5}}$, then find the value of $(a + b)^3$. [4]

Q5.(i)Prove the following: $(a + b)^{-1}(a^{-1} + b^{-1}) = \frac{1}{ab}$ [3]

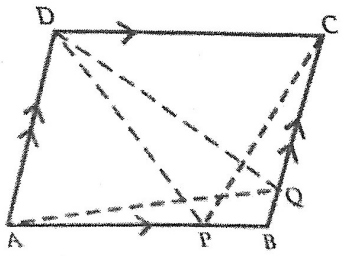
(ii)Factorise: ax – ay + bx - by [3]

(iii)The ratio of two numbers is $\frac{2}{3}$. If 2 is subtracted from the first and 8 from the second, the ratio becomes the reciprocal of the original ratio. Find the numbers. [4]

Q6.(i) Evaluate: $\frac{log8log9}{log27}$ [3]

(ii)D, E and F are midpoints of the sides BC, CA and AB respectively of an equilateral triangle ABC. Show that ΔDEF is also an equilateral triangle. [3]

(iii)In the figure given ABCD is a parallelogram. P,Q are any two points on the sides AB and BC respectively. Prove that area of Δ CPD = area of Δ AQD. [4]



Q7.(i)At what rate percent will Rs 2000 amount to Rs 2315.25 in 3 years at compound interest. [3]

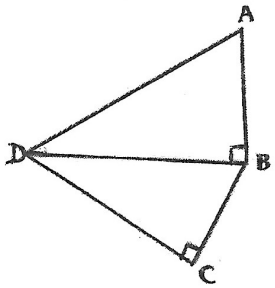
(ii)Solve for x: $3^{x+1} = (27)(3)^4$. [3]

(iii)Use ruler and compasses to construct a parallelogram with diagonals 6cm and 8cm in length having given the acute angle between them is 60^0. [4]

Q8.(i)The area of a trapezium is $540cm^2$. If the ratio of parallel sides is 7 : 5 and the distance between them is 18cm, find the length of parallel sides. [3]

(ii)Calculate the mean and the median of the numbers: 2, 3, 4, 3, 0, 5, 1, 1, 3, 2. [3]

(iii) In figure given ABCD is a quadrilateral in which AD = 13cm, DC = 12cm, BC = 3cm, $\angle ABD = \angle BCD = 90^0$.Calculate the length of AB. [4]



Q9.(i) Find the value of A if : $\sin 3A = \cos(A - 26^0)$, where 3A and $A - 26^0$ are acute angles. [3]

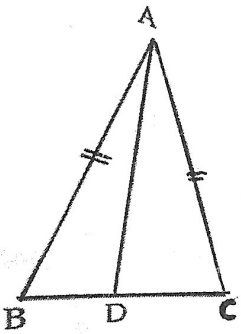
(ii) A cube of metal of 6cm edge is melted and cast into a cuboid whose base is 9cm x 8cm. Find the height of the cuboid. [3]

(iii)Draw a frequency polygon to represent the following data: [4]

Class interval	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	10	19	24	18	6

10.(i) Factorise: $x^2 + x^5$ [3]

(ii) In the adjoining figure, AB = AC and D is any point on BC . Prove that AB > AD. [3]



(iii)A copper wire when bent in the form of a square encloses an area of $121cm^2$. If the same wire is bent into the form of circle, find the area of the circle. [4]

END

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