



## ST. JOSEPH'S COLLEGE, PRAYAGRAJ

FINAL EXAMINATION 2024-25

MATHEMATICS

CLASS - IX

TIME: 3 Hours

MM: 80

### SECTION - A [40 Marks]

(Attempt all questions from this Section)

**Q 1) Choose the correct answers to the questions from the given option. (Do not copy the question write the correct answer only) [15]**

1.  $2.\bar{5}$  as vulgar fraction Becomes:

- (a)  $\frac{20}{9}$       (b)  $\frac{22}{9}$       (c)  $\frac{23}{9}$       (d)  $\frac{25}{9}$       (e) None of these

2. Rs 5000 were invested at 8% p.a compounded semi-annually for 1 year. The amount so obtained is:

- (a) Rs 5408      (b) Rs 5450      (c) Rs 5470      (d) Rs 5510      (e) None of these

3. If  $\left(x^2 + \frac{1}{x^2}\right) = 14$ , then  $\left(x + \frac{1}{x}\right)$  is equal to:

- (a)  $\sqrt{14}$       (b)  $\sqrt{12}$       (c) 4      (d) 7      (e) None of these

4. If  $x - 2y = 2$  and  $3x + y = 13$  then  $(x + y)$  is:

- (a) 5      (b) 4      (c) -5      (d) 3      (e) None of these

5. If  $3^{-3m} = 9$ , then the value of m is:

- (a)  $-\frac{2}{3}$       (b)  $\frac{2}{3}$       (c)  $\frac{1}{3}$       (d)  $-\frac{1}{2}$       (e) None of these

6. The point of intersection of the altitudes of a triangle is called its:

- (a) Circumcentre      (b) orthocentre      (c) centroid      (d) incentre  
(e) None of these

7. The value of  $\frac{\log 4}{\log 32}$  is:

- (a)  $\frac{5}{2}$       (b)  $\frac{1}{2}$       (c)  $\frac{2}{5}$       (d)  $\frac{1}{5}$       (e) None of these

8. In a right angled  $\triangle ABC$ , Right angled at B, if  $AB = 12$  cm and  $AC = 37$  cm, then BC

- (a) 35 cm      (b) 30 cm      (c) 26 cm      (d) 25 cm      (e) None of these

9. If an angle of a parallelogram is two-thirds of its adjacent angle, then the smaller of these angle is:

- (a)  $70^\circ$       (b)  $71^\circ$       (c)  $72^\circ$       (d)  $108^\circ$       (e) None of these

10. The chords AB and CD of a circle are such that,  $AB = CD$  and AB is at a distance of 4 cm from the centre. The distance of CD from the centre of the circle is:

- (a) 8 cm      (b) 6 cm      (c) 5 cm      (d) 4 cm      (e) None of these

11. The class interval of a frequency distribution are 1-10, 11-20, 21-30, ..... The class size is :

- (a) 9      (b) 10      (c) 9.5      (d) 10.5      (e) None of these

12. The mean of first 10 prime numbers is:

- (a) 12.9      (b) 11.2      (c) 10.8      (d) 10.7      (e) None of these

13. The height of an equilateral triangle is  $6\sqrt{3}$  cm. Area of the triangle is:

- (a)  $36 \text{ cm}^2$       (b)  $36\sqrt{3} \text{ cm}^2$       (c)  $144\sqrt{3} \text{ cm}^2$       (d)  $108\sqrt{3} \text{ cm}^2$       (e) None of these

14. The circumference of a circle is 88 cm. Area of the circle is:

- (a)  $600 \text{ cm}^2$       (b)  $605 \text{ cm}^2$       (c)  $610 \text{ cm}^2$       (d)  $616 \text{ cm}^2$       (e) None of these

15. If  $\tan \theta = \frac{5}{12}$  Then  $13(\sin \theta + \cos \theta)$  is equal to:

- (a)  $\frac{17}{13}$       (b) 17      (c)  $\frac{13}{17}$       (d) 13      (e) None of these

**Q 2) (i) The length and breadth of a rectangular grassy plot are in the ratio 7 : 4. A path 4m wide running all around outside it has an area of  $416 \text{ m}^2$ . Find the dimensions of the grassy plot. [4]**

(ii) Show that the points  $A(2,-1)$ ,  $B(3,4)$ ,  $C(-2,3)$  and  $D(-3,-2)$  are the vertices of a rhombus. [4]

(iii) Two circles of radii 17cm and 25cm intersect each other at two points A and B. If the length of common chord AB of the circles be 30cm, find the distance between the centers of the circles. [4]

Q 3) (i) Draw a frequency polygon to represent the following data: [4]

Weekly Wages(in Rs)	750-850	850-950	950-1050	1050-1150	1150-1250
No. of Workers	52	41	65	54	38

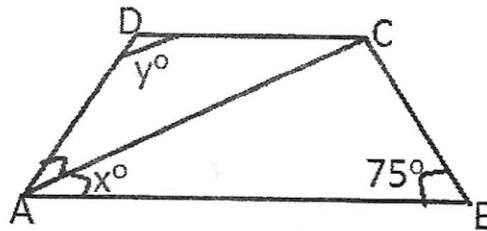
(ii) The length, breadth and height of a rectangular solid are in the ratio 6 : 5 : 4 . If the total surface area is  $5328\text{cm}^2$ , find the length ,breadth and height of solid. [4]

(iii) Solve the following simultaneous equations graphically: [5]  
 $2x + 3y = 12$ ,  $x - y = 1$

**SECTION - B [40 Marks]**

(Attempt any four questions from this Section)

Q 4) (i) The difference between the simple interest and compound interest on a sum of money for 2 years at 12% per annum is Rs 216 . Find the sum . [3]



(ii) In the given figure, AC is bisector of  $\angle A$  . If  $AB=AC$ ,  $AD=CD$  and  $\angle ABC = 75^\circ$  , find the value of  $x$  and  $y$  . [3]

(iii) If  $4 \cot \theta = 3$  ,show that  $\left( \frac{\sin \theta - \cos \theta}{\sin \theta + \cos \theta} \right) = \frac{1}{7}$  [4]

Q 5) (i) Factorise  $a(a-1)-b(b-1)$  . [3]

(ii) Show that  $\log(1+2+3) = \log 1 + \log 2 + \log 3$  . [3]

(iii) The sum of length, breadth and depth of a cuboid is 19 cm and length of its diagonal is 11 cm. Find the surface area of the cuboid. [4]

Q 6) (i) The diameter of the diving wheel of a bus is 140cm. How many revolutions must the wheel make in order to keep a speed of 66 km/hr? . [3]

(ii) If  $2^x = 3^y = 6^{-z}$  , show that  $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 0$  . [3]

(iii) Prove that  $\sqrt{2}$  is an irrational number. [4]

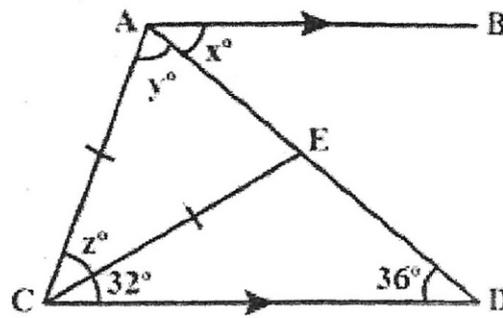
Q 7) (i) If  $(a^2 + b^2 + c^2) = 125$  and  $(ab + bc + ca) = 50$  , find the value of  $(a + b + c)$  . [3]

(ii) The area of a triangle is  $216\text{cm}^2$  and its sides are in the ratio 3 : 4 : 5 . Find the perimeter of the triangle. [3]

(iii) Construct a quadrilateral ABCD in which  $AB=CD=5.1\text{cm}$ ,  $BC=4.7\text{cm}$ ,  $DA=4.2\text{cm}$  and  $\angle BCD = 60^\circ$  [4]

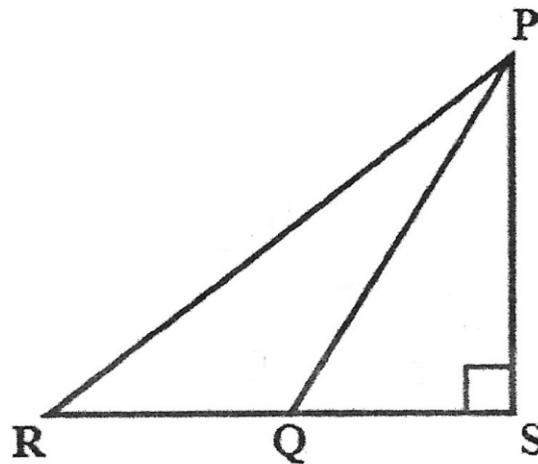
Q 8) (i) In the given figure,  $AB$  is parallel to  $CD$  and  $CA=CE$ . Find the values of  $x, y$  and  $z$  .

[3]



(ii) In the figure  $\angle PSR = 90^\circ$ ,  $PQ = 10\text{cm}$ ,  $QS = 6\text{cm}$  and  $RQ = 9\text{cm}$ , Calculate the length of  $PR$ .

[3]



(iii) Prove that the figure obtained by joining the mid-points of the adjacent sides of a quadrilateral is a parallelogram. [4]