COMMON HALF-YEARLY EXAMINATION - 2019

Standard IX Reg.No. | | | | | | |

MATHEMATICS

Time: 3.00 hours. Marks: 100

Part - I

I. Choose the correct answer: 14 x 1 = 14

1. If n(A) = 10, n(B) = 15, the minimum and maximum number of elements in $A \cap B$ is
   a) 10, 15 b) 15, 10 c) 10, 0 d) 0, 10
2. For any three sets A, B and C, $(A - B) \cap (B - C)$ is equal to
   a) A only b) B only c) C only d) ϕ
3. If $A - B = A$ then
   a) $A \cap B = \phi$ b) $A \cup B = \phi$ c) $A \cup B \neq \phi$ d) $A / B = \phi$
4. If $\sqrt{80} = K\sqrt{5}$ then K =
   a) 2 b) 4 c) 8 d) 16
5. If $\sqrt{9^x} = \sqrt[3]{9^2}$ then x =
   a) $\frac{2}{3}$ b) $\frac{4}{3}$ c) $\frac{1}{3}$ d) $\frac{5}{3}$
6. Find the odd one out of the following:
   a) $\sqrt{128} \times \sqrt{2}$ b) $\frac{\sqrt{96}}{\sqrt{6}}$ c) $\sqrt{54} \times \sqrt{6}$ d) $\frac{\sqrt{54}}{\sqrt{18}}$
7. Which of the following is a solution of $2x - y = 6$
   a) (2, 4) b) (4, 2) c) (3, –1) d) (0, 6)
8. Zeros of $(5 - 7x)$ is
   a) 5 b) 7 c) $\frac{5}{7}$ d) $\frac{7}{5}$
9. Degree of the constant polynomial is
   a) 3 b) 2 c) 1 d) 0
10. In a cyclic quadrilateral $\angle A = 4x$, $\angle C = 2x$, then the value of x is
    a) 30° b) 20° c) 15° d) 65°
11. The angles of the triangle are $3x - 40$, $x + 20$ and $2x - 10$ then the value of x is
    a) 40° b) 35° c) 50° d) 45°
12. The mid point of the line joining (–a, 2b) and (–3a, –4b) is
    a) (2a, 3b) b) (–2a, –b) c) (2a, b) d) (–2a, –3b)
13. The distance between the two points (4,3) and (9,3) is
    a) 3 b) 4 c) 5 d) 8
14. If (x+2, 4) = (5, y–2) then the co-ordinates of (x,y) are
    a) (7, 12) b) (6, 3) c) (3, 6) d) (2, 1)

Part - II

II. Answer any 10 questions: (Ques.No.28 is compulsory) 10 x 2 = 20

15. If A = {6,7,8,9}, B = {8,10,12}, find A \ B
16. Draw a Venn diagram $(A \cap B)'$
17. If n(A) = 36, n(B) = 10, $n(A \cup B) = 40$, n(A') = 27, find $n(A \cap B)$, n(U)
18. Rationalise the determination: $\frac{5+\sqrt{3}}{5-\sqrt{3}}$
19. Convert $.4\overline{5}$ in the form of p/q
20. Write down $(.00000005)^3$ in scientific notation.
21. Find the remainder $3x^3 + 5x^2 - 7x - 9$ is divided by $(x + 2)$
22. Factorize: $2x^2 + 9x + 10$
23. Find GCD of $x^4 - 1$, $x^2 + 1$
24. The angles of quadrilateral are in the ratio 2:4:5:7. Find all angles.
25. If PQRS is a cyclic quadrilateral in which $\angle PSR = 70^\circ$ and $\angle QPR = 40^\circ$, find $\angle PRQ$.
26. The point (3,–4) is the centre of a circle. If AB is a diameter of the circle and B is (5,–6). Find the co-ordinates of A.
27. Find the centroid of the triangle whose vertices are (6,–1), (8,3) and (10,–5)
28. Solve: $\frac{x}{10}+\frac{y}{5}=14$, $\frac{x}{8}+\frac{y}{6}=15$

Part - III

III. Answer any 10 questions: (Ques.No.42 is compulsory) 10 x 5 = 50

29. If $U = \{x : x \in Z, -2 \le x \le 11\}$, A = {–1, 1, 3, 5, 7}, B = {–2, 4, 7, 10}, verify De Morgan's law of complementation.
30. Verify $A - (B \cup C) = (A - B) \cap (A - C)$ using Venn diagram.
31. In a group of 100 students, 85 speak Tamil, 40 students speak English, 20 students speak French. 32 speak Tamil and English, 13 speak English and French, 10 speak Tamil and French. If each student knows atleast any one of these languages, then find the number of students who speak all these three languages.
32. Represent 4.863 on the number line.
33. Arrange in ascending order: $\sqrt[3]{2}$, $\sqrt[2]{4}$, $\sqrt[4]{3}$
34. If $x = \sqrt{5} + 2$ then find the value of $x^2 + \frac{1}{x^2}$
35. Factorise : $x^3 - 5x^2 - 2x + 24$

36. The sum of the digits of a given two digit number is 5. If the digit are reversed the new number is reduced 27. Find the given number.
37. Find the quotient and remainder when $8x^3 - 6x^2 + 15x - 7$ is divided by $2x + 1$
38. Find the length of a chord which is at a distance of $2\sqrt{11}$ cm from the centre of radius 12 cm.
39. If PQRS is a cyclic quadrilateral in which $\angle PSR = 70^\circ$ and $\angle QPR = 40^\circ$, then find $\angle PRQ$.
40. Find the points of trisection of the line segment joining (–2, –1) and (4, 8)
41. Show that (7, 10), (–2, 5), (3, –4) are the vertices of a right angled triangle.
42. The mid points of the sides of a triangle are (5,1), (3,–5) and (–5,–1). Find the co-ordinates of the vertices of a triangle.

Part - IV

IV. Answer both the questions: 2 x 8 = 16

43. a) Construct circum centre of the ΔABC with AB = 5, $\angle A = 60^\circ$, $\angle B = 80^\circ$. Also draw the circum circle and find circum radius of the ΔABC.

(or)

b) Prove in a parallelogram opposite sides are equal.

44. a) Use graphical method to solve:

$x + y = 5$

$2x - y = 4$

(or)

b) Solve $8x - 3y = 5xy$, $6x - 5y = -2xy$ by the method of elimination.