J B Academy
Annual Examination 2024-25
Class – IX, Sub : Mathematics

Time Allowed: 3 hours   Max. Marks: 80

General Instructions:

- This Question paper contains - five sections A, B, C, D and E. Each section is compulsory.
  However, there are internal choices in some questions.

- Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.
- Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.
- Section C has 6 Short Answer (SA)-type questions of 3 marks each.
- Section D has 4 Long Answer (LA)-type questions of 5 marks each.
- Section E has 3 source based/case based/passage based/integrated units of assessment (4 marks each) with sub parts.

Section - A

1. Number of rational numbers between $\sqrt{145}$ and $\sqrt{154}$ is
   a) 13   b) 200 m^2 c) infinitely many   d) 0

2. The p/q form of $0.\overline{72}$ is
   a) 11/8   b) 8/11   c) 73/99   d) None of these

3. The value of $(81)^{-3/4}$ is
   a. 27   b) 81   c) 1   d) none of these

4. When simplified $(x^{-1} + y^{-1})$ is equal to
   a) Xy   b) 1/ xy   c) (x+y)/xy   d) None of these

5. The given statement" (x+5) is the factor of the polynomial x^2 +3x+115" is
   a) True   b) False   c) Can't be determined   d) None of these

6. For the polynomial p(x)= $2x^2$-6x, the value of p(-1) +p(2) =……
   a. -12   b. 4   c. 10   d. None of these

7. If (a+b)= 3 and ab= 2 find value of $a^2+ b^2$
   a. 4   b. 5   c. 6   d. None of these

8. The linear equation 3x-5y=15 has
   a. 2 solutions   b. Only one solution   c. Infinitely many solutions   d. None of these

9. Which of the following is not the solution of 4x-y= 10?
   a. (3,2)   b. (2,-2)   c. (7,18)   d. ((2,2)

10. Two points having same abscissa but different ordinates lie on
    a. X-axis   b. Y-axis   c. Origin   d. None of these

11. If the diagonals of a parallelogram are equal then it is a ……….
    a. Rectangle   b. Rhombus   c. Trapezium   d. None of these

12. Can $110^0, 80^0, 90^0, 75^0$ be angles of a quadrilateral?
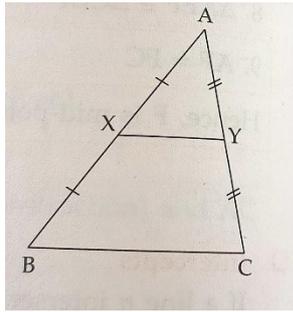   a. Yes   b. No   c. Can't Say   d. None of these

13. In the given figure X and Y are mid-points of the sides AB and AC respectively of △ABC. If BC = 6cm, AB = 7.4 cm and AC = 6.4cm, then find perimeter of trapezium XBCY.

    a. 6.9cm   b. 9.9cm   c. 9cm   d. None of these

14. The following statement is true or false, "ABCD is a cyclic quadrilateral such that   A= 90°, B= 75°,   C = 95° and D= 105°".

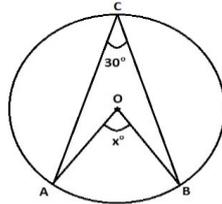   a. True   b. False   c. Can't be determined   d. None of these

15. In the adjoining figure, O is the centre of the circle if   ACB =150° find   AOC

    a. 60°
    b. 120°
    c. 300°
    d. None of these

16. A sector is a region enclosed by
    a. A radius and two arcs   c. A chord and an arc
    b. Two radii and an arc   d. None of these

17. 1000 cm^3= 1 ……, given relation is
    a. Kilolitre   c. Millilitre
    b. Centilitre   d. Litre

18. In the class interval 10-20,20-30, the observation 20 is included in
    a. Both intervals   c. none of these intervals
    b. 10-20   d. 20-30

19. **Assertion (A)**: The marks obtained by 12 students in a monthly test are 11 ,19 ,7, 13, 18, 21 ,9 ,5, 20,17,16 21, the mean of their marks is 18.
    Reason (R): The mean of marks $=\dfrac{Sum\ of\ marks\ of\ all\ students}{Number\ of\ students}$
  a) Both A and R are true and R is the correct explanation of A
  b) Both A and R are true but R isnot the explanation of A.
  c)A is true but R is false.   d) A is false but R is true.

20. **Assertion (A):**If the sides of a triangle are 56 cm, 60 cm and 52 cm, then the area of triangle is 1344 sq. cm.
    Reason (R): Area of the triangle $=\sqrt{s(s-a)(s-b)(s-c)}$, s = semi-perimeter, a,b,c are sides of the triangle
  a) Both A and R are true and R is the correct explanation of A
  b) Both A and R are true but R isnot the explanation of A.
  c)A is true but R is false.   d) A is false but R is true

Section – B

21. In which quadrant/axis will the point lie, if :

(i) The y-coordinate is 3 and the x-coordinate is -4?

(ii) The x-coordinate is -5 and the y-coordinate is -3?

(iii) The y-coordinate is 4 and the x-coordinate is 5?

(iv) The y-coordinate is 4 and the x-coordinate is 0?

OR

Write four different solutions of the equation 3x-y=6

22. The curved surface area of a cone is 308 cm^2 and its slant height is 14cm find its radius and total surface area.

23. The volume of two spheres is 64:27, find ratio of their surface areas.

OR

The sphere has radius 7cm, find its surface area and volume.

24. If a= 3+2$\sqrt{2}$, find the value of (a-$\frac{1}{a}$)

25. The number of goals scored by a football team in a series of matches are: 3,1,0,7,5, 3,3,4,1,2,0,2.
Find the median of the data.

Section – C

26. Plot graph for 2x+y = 12 and x+y= 10 and find their point of intersection.

27. If the mean of 7 numbers is 12. If six of them are 5, 13, 9, 17,14 and 10 , then find the seventh observation.

OR

Find the mean of following data:-

x	10	30	50	70	90
f	17	28	32	24	19

28. Using identities find the value of :-
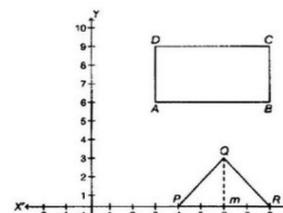a) 55³   b)104x96   c)98³

29. Prove that equal chords are equidistant from the centre.

OR

If the non-parallel sides of a trapezium are equal, prove that it is cyclic.

30. Find the value of:-
i) Write the coordinates of point Q.

ii) Find the area (in sq units) of rectangle ABCD.

iii) Find the area of triangle PQR

31. Prove that in a square, diagonals are equal and perpendicular bisector of each other.

OR

ABCD is a rhombus and P, Q, R and S are the mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rectangle.

Section - D

32. Construct a frequency polygon for the following frequency distribution: -

Class-interval	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	8	3	6	12	2	7

33. The volume of a conical tent is 1232 m³ and the area of the base of the floor is 154 m².
    Calculate :
    (i)the radius of the floor
    (ii)height of the tent
    (iii)the length of the canvas required to cover this conical tent if it's with is 2 m

34. Three girls Reshma, Salma and Mandip are playing a game by standing on a circle of radius 5m drawn in a park. Reshma throws a ball to Salma, Salma to Mandip, Mandip to Reshma. If the distance between Reshma and Salma and between Salma and Mandip is 6m each, what is the distance between Reshma and Mandip?

OR

 Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their
 centres is 4 cm.Find the length of the common chord.

35. Factorise:
    a) 12x²-7x+1
    b) x³+13x²+32x+20

Section E- Case Study Based

36. Triangles are used in the construction of bridges because they evenly distribute weight without changing their proportions. When force is applied on a shape like rectangle it would flatten out. Before triangles were used in bridges, they were weak and could not be very big. To solve that problem, engineers would put a posting the middle of a square and make it sturdy. Isosceles triangles were used to construct a bridge in which the base and the equal sides of an isosceles triangle are in the ratio 1: 2 : 2 and its perimeter is 200m

    i)   What is the semi perimeter of the isosceles triangle?
    ii) What are the measurements of the sides of the isosceles triangle?
    iii) Find area of the above isosceles triangle.
                    OR

Find the cost of painting the so formed isosceles triangle if the rate of painting is Rs 18.25 per sqm.

37. A hemisphere is half of a sphere. It has two surfaces: a curved surface and a flat circular base. Understanding its surface area and volume is crucial in real-life applications like designing domes, bowls, and storage containers.
An architect is designing a hemispherical dome for a museum. The radius of the dome is 7 meters. Answer the following questions:-
1. Total surface area of hemisphere is half of the surface area of a sphere. (True/False)
2. The curved surface area of the dome.
3. The total surface area if the base needs plastering.
4. The volume of air enclosed inside the dome.

38. The graph of the lines 2x+4y=8 and 3x+6y=18 is given. Read the graph and answer the following questions.
Find
(i) The graph of line 2x+4y = 8 will intersect X-axis at the point
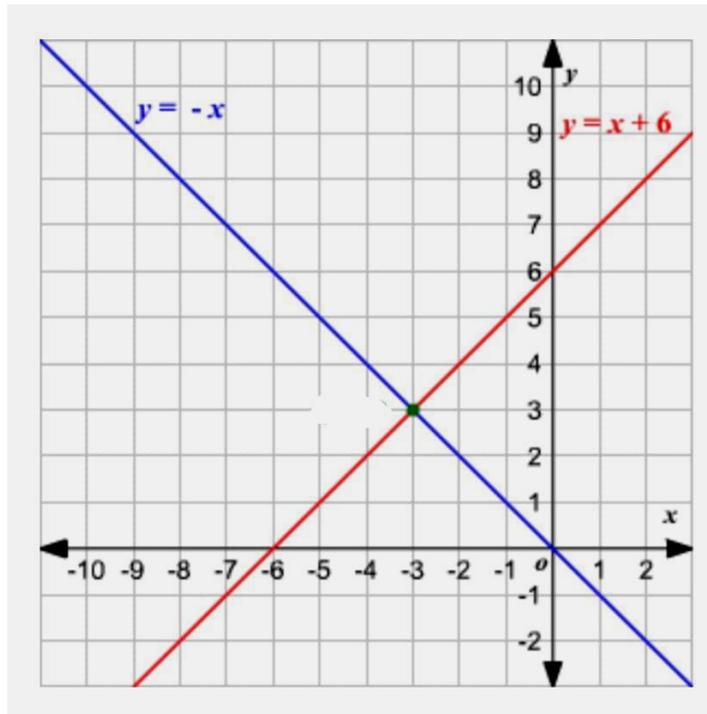a. (4,0)   c. (2,0)
b. (0,4)   d.(0,2)
(ii) The graph of the line 3x+6y=18 intersects Y-axis at the point
a. (4,0)   c. (2,0)
b. (0,4)   d.(0,2)
(iii) Write co-ordinates of point of intersection of both the lines.
(iv) Find the area enclosed between both lines and X-axis.