

# KENDRIYA VIDYALAYA SANGATHAN PATNA REGION

Model Paper(SEE) (2024-25)

CLASS- IX

Time allowed:- 3 Hrs.

Max. Marks: 80

## General Instructions:

1. This question paper has 5 sections A,B,C,D and E.
  2. Section A has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.
  3. Section B has 5 Short Answer-I (SA-I) type questions carrying 2 marks each.
  4. Section C has 6 Short Answer-II (SA-II) type questions carrying 3 marks each.
  5. Section D has 4 Long Answer (LA) type questions carrying 5 marks each.
  6. Section E has 3 Case Based integrated units of assessment (4 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
  7. All Questions are compulsory. However, an internal choice in 2 Qs of 2 marks, 2 Qs of marks 3 marks and 2 Questions of 5 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.
  8. Draw neat figures wherever required. Take  $\pi = 22/7$  wherever required if not stated.
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## Section-A

### Section A consists of 20 questions of 1 mark each.

1. Rational number 0.6 is equal to.....  
(a)  $\frac{6}{10}$   
(b)  $\frac{2}{3}$   
(c)  $\frac{3}{10}$   
(d) None of these
2. The value of  $32^{-2/5}$  is  
(a)  $\frac{1}{2}$   
(b) 4  
(c)  $\frac{1}{4}$   
(d) 64
3. Zeros of the polynomial  $P(x)=(x+8)(x-10)$  are:  
(a) -10,8  
(b) -8,-10  
(c) 8,10  
(d) -8,10
4. In between any two numbers, there are:  
(a) Only one rational number  
(b.) Two rational numbers  
(c) Infinite rational numbers  
(d.) No rational number
5. The degree of polynomial  $P(x) = X^4+3x^3+3x^2+x+1$  is:  
(a) 0  
(b) 4  
(c) 3  
(d) More than 4
6. The coefficient of  $x^2$  in  $3x^3+2x^2-x+1$  is:  
(a) 1  
(b) 2  
(c) 3  
(d) -1
7.  $x^2 - 3x + x^3$  is \_\_\_\_\_ polynomial.  
(a) Cubic  
(b) Quadratic  
(c) Linear  
(d) None of the above
8. The solution of equation  $x-2y = 4$  is:  
(a) (0,2)  
(b) (2,0)  
(c) (4,0)  
(d) (1,1)

9. Find the value of k, if  $x = 1$ ,  $y = 2$  is a solution of the equation  $2x + 3y = k$ .
- (a) 5 (b) 6  
(c) 7 (d) 8
10. Lines which are parallel to the same line are \_\_\_\_\_ to each other
- (a) Coincident (b) Perpendicular  
(c) Parallel (d) Equal
11. The longest chord of the circle is:
- (a) Radius (b) Arc  
(c) Diameter (d) Segment
12. Three angles of a quadrilateral are  $75^\circ$ ,  $90^\circ$  and  $75^\circ$ . The fourth angle is
- (a)  $90^\circ$  (b)  $95^\circ$   
(c)  $105^\circ$  (d)  $120^\circ$
13. Two angles whose sum is equal to  $90^\circ$  are called:
- (a) Vertically opposite angles (b) Supplementary angles  
(c) Complementary angles (d) Linear pair angles
14. The sides of a parallelogram are 100 m each and the length of the longest diagonal is 160 m. The area of a parallelogram is:
- (a)  $9600 \text{ m}^2$  (b)  $9000 \text{ m}^2$   
(c)  $9200 \text{ m}^2$  (d)  $8800 \text{ m}^2$
15. The perimeter of an equilateral triangle is 60 m. The area is:-
- (a)  $10\sqrt{3} \text{ m}^2$  (b)  $15\sqrt{3} \text{ m}^2$   
(c)  $20\sqrt{3} \text{ m}^2$  (d)  $100\sqrt{3} \text{ m}^2$
16. The curved surface area of a right circular cylinder of height 14 cm is  $88 \text{ cm}^2$ . The diameter of the base is:
- (a) 2 cm (b) 3 cm  
(c) 4 cm (d) 6 cm
17. The radius of a hemispherical balloon increases from 6 cm to 12 cm as air is being pumped to it. The ratio of the surface areas of the balloon in the two cases is
- (a) 1:4 (b) 1:3  
(c) 2:3 (d) 2:1
18. Find the range of the following data: 25, 18, 20, 22, 16, 6, 17, 15, 12, 30, 32, 10, 19, 8, 11, 20.
- (a) 10 (b) 15  
(c) 18 (d) 26

**Direction:** In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R).

Choose the correct option:

19. Statement A (Assertion): The class mark of the class interval (90-120) is 105.  
Statement R (Reason): The difference of the highest and the lowest values in the data is called the Range.
- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

- (b) Both assertion (A) and reason (R) are true and reason (R) is the not the correct explanation of assertion (A).  
 (c) Assertion (A) is true but reason (R) is false.  
 (d) Assertion (A) is false but reason (R) is true.
20. Statement A (Assertion): Degree of the polynomial  $4x^6 - 3x^2 + 9x - 1$  is 6.  
 Statement R (Reason): The highest power of the variable in a polynomial is called the degree of the polynomial.
- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).  
 (b) Both assertion (A) and reason (R) are true and reason (R) is the not the correct explanation of assertion (A).  
 (c) Assertion (A) is true but reason (R) is false.  
 (d) Assertion (A) is false but reason (R) is true.

### Section – B

Section B consists of 5 questions of 2 marks each.

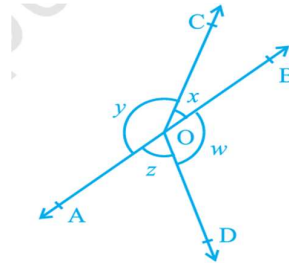
21. Rationalise the denominators of  $\frac{1}{\sqrt{6}-\sqrt{5}}$

OR

Simplify: -  $2^{2/3} \times 2^{1/3} / 2^{-1}$

22. Factorise: -  $4y^2 - 4y + 1$ .

23. In the given figure, if  $x + y = w + z$ , then prove that AOB is a line.



24. The angles of quadrilaterals are in the ratio 3: 5: 9: 13. Find all the angles of the quadrilaterals.  
 25. Find the volume of right circular cone with radius 6 cm, height 7 cm.

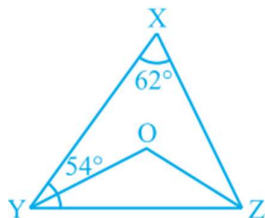
### Section – C

Section C consists of 6 questions of 3 marks each.

26. Factorise the following: -  
 $-125a^3 + 225a^2 - 135a + 27$

27. Find two solutions for the following equation: -  
 $4x + 3y = 12$

28. In the given figure,  $\angle X = 62^\circ$ ,  $\angle XYZ = 54^\circ$ . If YO and ZO are the bisectors of  $\angle XYZ$  and  $\angle XZY$  respectively of  $\Delta XYZ$ , find  $\angle OZY$  and  $\angle YOZ$ .



29. Show that the line segments joining the mid points of the consecutive sides of a quadrilateral form a parallelogram.

**OR**

ABC is an isosceles triangle with  $AB = AC$ . Draw  $AP \perp BC$  to show that  $\angle B = \angle C$ .

30. Prove that equal chords of a circle subtend equal angles at the centre.

31. Sides of a triangle are in the ratio of 12: 17: 25 and its perimeter is 540cm. Find its area.

### Section – D

Section D consists of 4 questions of 5 marks each.

32. Simplify each of the following expressions: -

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

(ii)  $(\sqrt{5} + \sqrt{2})^2$

33. Verify that  $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2}(x+y+z)[(x-y)^2 + (y-z)^2 + (z-x)^2]$

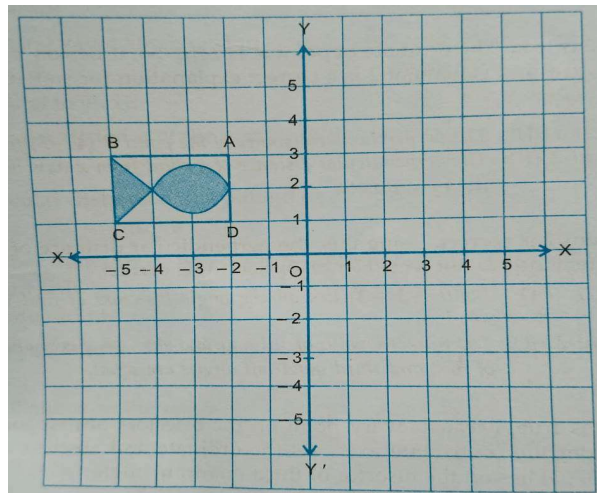
34. Show that Angles opposite to equal sides of an isosceles triangle are equal.

35. Show that if the diagonals of a quadrilateral bisect each other at right angles, then it is a rhombus.

### Section – E

Case study based questions are compulsory:

36. For maths integrated projects, Sonia created a symmetrical design on Cartesian plane. She drew a fish in a rectangle ABCD in the 2<sup>nd</sup> Quadrant as shown in the figure.



Based on the above information answer the following question –

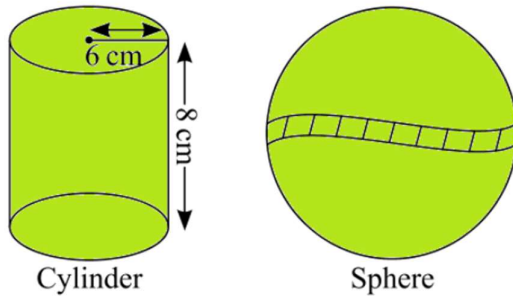
- (i) Find the Sum of abscissa of points A and B.
- (ii) Find the area of rectangle ABCD.
- (iii) What will be the new coordinates of A, B, C and D to draw the reflection of fish in the 3<sup>rd</sup> Quadrant across x-axis.

Or,

- (iii) What will be the new coordinates of A, B, C and D to draw the fish by shifting each vertex of rectangle 5 units to the right.

37. Mr. Kunal, a Mathematics teacher brings some green coloured clay in the classroom to teach the topic 'mensuration'. First, he forms a cylinder of radius 6 cm and height 8 cm with the clay. Then, he moulds that cylinder into a sphere similarly, he moulds the sphere in other different shapes.

Answer the following questions :



(i) Which of the following is not a 3D shape?

(a) Cone

(c) Rectangle

(b) Cuboid

(d) Sphere

(ii) What is the formula of volume of a sphere?

(a)  $\frac{2}{3}\pi r^3$

(b)  $\pi r^3$

(c)  $\frac{1}{3}\pi r^3$

(d)  $\frac{4}{3}\pi r^3$

(iii) What is the volume of cylindrical shape ?

(a)  $268\pi \text{ cm}^3$

(c)  $36\pi \text{ cm}^2$

(b)  $288\pi \text{ cm}^3$

(d)  $48\pi \text{ cm}^2$

OR

(iii) What is the Surface area of moulded sphere ?

(a)  $144\pi \text{ cm}^2$  (b)  $288\pi \text{ cm}^2$  (c)  $286\pi \text{ cm}^2$  (d)  $143\pi \text{ cm}^2$

38. The marks of 40 students of a mid-term examination of Mathematics of class IX is shown below:

11,18,38,62,75,42,54,62,58,26,32,35,61,68,72,73,54,17,28,16,32,35,32,38,34,44,65,72,78,15,30,32,35,54,62,66,5,19,76,9

(i) What are the minimum and maximum marks obtained?

(ii) Find the range of the data?

(iii) Taking class interval 0-10,10-20 and so on , construct a frequency distribution table.

OR ,

(iii) How many students got less than 50 marks ?

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