Class IX Session 2023-24
Subject - Mathematics
Sample Question Paper - 3

Time Allowed: 3 hours   **Maximum Marks: 80**

General Instructions:

1. This Question Paper has 5 Sections A-E.

2. Section A has 20 MCQs carrying 1 mark each.

3. Section B has 5 questions carrying 02 marks each.

4. Section C has 6 questions carrying 03 marks each.

5. Section D has 4 questions carrying 05 marks each.

6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.

7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.

8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

Section A

1. The number $0.\overline{3}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$, is   **[1]**

   a) $\frac{3}{100}$ b) $\frac{3}{10}$

   c) $\frac{33}{100}$ d) $\frac{1}{3}$

2. The line represented by the equation x + y = 16 passes through (2, 14). How many more lines pass through the point (2, 14)   **[1]**

   a) 10   b) 2

   c) many   d) 100

3. The point whose ordinate is 3 and which lies on the y-axis is   **[1]**

   a) (3,3)   b) (3,0)

   c) (1,3)   d) (0,3)

4. In a histogram the class intervals or the groups are taken along   **[1]**

   a) X-axis   b) Y-axis

   c) both of X-axis and Y-axis   d) in between X and Y axis

5. Which of the following point does not lie on the line y = 2x + 3?   **[1]**

   a) (-5, -7)   b) (-1, 1)

   c) (3, 9)   d) (3, 7)

6. The total number of propositions in the Euclid's Elements is **[1]**

   a) 460   b) 465

   c) 32   d) 13

7. Given that lines l_1, l_2 and l_3 in figure are parallel. The value of x is: **[1]**

   a) 140^0 b) 40^0

   c) $50°$ d) $80°$
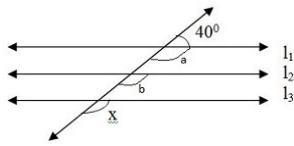
8. ABCD is a trapezium in which AB || DC. M and N are the mid-points of AD and BC respectively. If AB = 12 cm, MN = 14 cm, then CD = **[1]**

   a) 10 cm   b) 14 cm

   c) 12 cm   d) 16 cm

9. If $x^3 + \frac{1}{x^3} = 110$, then $x + \frac{1}{x} =$ **[1]**

   a) 15   b) none of these

   c) 5   d) 10

10. If (-2, 5) is a solution of 2x + my = 11, then the value of 'm' is **[1]**

    a) -2   b) 2

    c) 3   d) -3

11. ABCD is a Rhombus such that $\angle ACB = 40°$, then $\angle ADB$ is **[1]**

    a) $100°$ b) $40°$
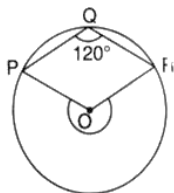
    c) $60°$ d) $50°$

12. The Quadrilateral formed by joining the mid-points of the sides of a Quadrilateral PQRS, taken in order, is a rectangle if **[1]**

    a) PQRS is a Rectangle   b) None of these

    c) PQRS is a Parallelogram   d) Diagonals of PQRS are at right angles.

13. What fraction of the whole circle is minor arc RP in the given figure? **[1]**

    a) $\frac{1}{4}$ of the circle   b) $\frac{1}{5}$ of the circle

    c) $\frac{1}{3}$ of the circle   d) $\frac{1}{2}$ of the circle

14. The sum of $0.\overline{3}$ and $0.\overline{4}$ is **[1]**

    a) $\frac{7}{11}$ b) $\frac{7}{99}$
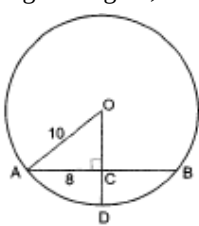
   c) $\frac{7}{10}$ d) $\frac{7}{9}$

15. The graph of the linear equation 2x + 3y = 6 is a line which meets the x-axis at the point **[1]**

    a) (0,3)   b) (3,0)

    c) (2, 0)   d) (0 ,2)

16. The side BC of △ABC is produced to a point D. The bisector of ∠A meets side in L. If ∠ABC = 30° and ∠ACD = 115°, then ∠ALC = **[1]**

    a) 85°   b) None of these

    c) 145°   d) $72\frac{1}{2}^{\circ}$

17. In a bar graph, 0.25 cm length of a bar represents 100 people. Then, the length of bar which represents 2000 people is **[1]**

    a) 4.5 cm   b) 4 cm

    c) 5 cm   d) 3.5 cm

18. If the ratio of volumes of two spheres is 1 : 8, then the ratio of their surface areas is **[1]**

    a) 1 : 4   b) 1 : 2

    c) 1 : 16   d) 1 : 8

19. **Assertion (A):** The sides of a triangle are in the ratio of 25 : 14 : 12 and its perimeter is 510 cm. Then the area of the triangle is 4449.08 cm^2. **[1]**

    Reason (R): Perimeter of a triangle = a + b + c, where a, b, c are sides of a 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 is not the correct explanation of A.

    c) R is not the correct explanation of A.   d) A is false but R is true.

20. **Assertion (A):** There are infinite number of lines which passes through (2, 14). **[1]**

    Reason (R): A linear equation in two variables has infinitely many solutions.

    a) Both A and R are true and R is the correct explanation of A.   b) Both A and R are true but R is not the correct explanation of A.

    c) A is true but R is false.   d) A is false but R is true.

Section B

21. The perimeter of an equilateral triangle is 60 cm. Find its height. Given ($\sqrt{3}$ = 1.732). **[2]**

22. In given figure, if OA = 10, AB = 16 and OD ⊥ to AB. Find the value of the CD. **[2]**

23. A conical pit of top diameter 3.5 m is 12 m deep. What is its capacity in kilolitres? **[2]**

24. If O is the centre of the circle, find the value of x in given figure: **[2]**
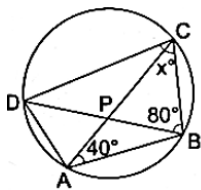
OR

On a common hypotenuse AB, two right triangles ACB and ADB are situated on opposite sides. Prove that ∠BAC = ∠BDC.

25. Express the linear equation in the form ax + by + c = 0 and indicate the values of a, b and c in 2x = -5y. **[2]**

OR

Write the linear equation represented by line AB and PQ. Also find the co-ordinate of intersection of line AB and PQ.
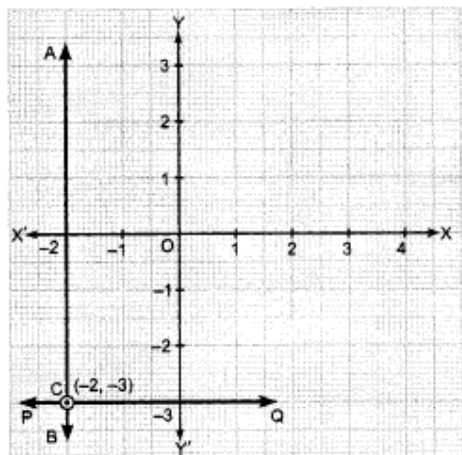
Section C

26. If $a = \frac{2+\sqrt{5}}{2-\sqrt{5}}$ and $b = \frac{2-\sqrt{5}}{2+\sqrt{5}}$, then find the value of a² - b². **[3]**

27. Find the remainder when $x^3 + 3x^2 + 3x + 1$ is divided by **[3]**
$5 + 2x$

28. One side of an equilateral triangle is 8 cm. Find its area by using Heron's Formula. Find its altitude also. **[3]**

OR

The sides of a triangle are in the ratio of 13 : 14 : 15 and its perimeter is 84 cm. Find the area of the triangle.

29. For what value of c, the linear equation 2x + cy = 8 has equal values of x and y for its solution? **[3]**

30. In a parallelogram, show that the angle bisectors of two adjacent angles intersect at right angles. **[3]**

OR

BN and CM are perpendiculars to a line passing through the vertex A of a triangle ABC. If L is the mid point of BC, Prove that LM = LN.
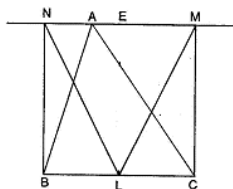
31. Draw the graphs of y = x and y = -x in the same graph. Also find the co-ordinates of the point where the two lines intersect. **[3]**

Section D

32. Represent each of the numbers $\sqrt{5}, \sqrt{6}$ and $\sqrt{7}$ the real line. **[5]**
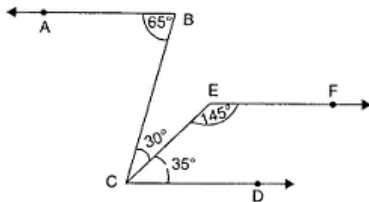
OR

Page 4 of 19

If $a = \frac{1}{7-4\sqrt{3}}$ and $b = \frac{1}{7+4\sqrt{3}}$, then find the value of:
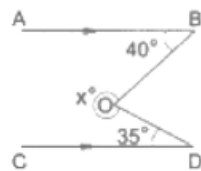
 i. $a^2 + b^2$

 ii. $a^3 + b^3$

33. In a line segment AB point C is called a mid-point of line segment AB, prove that every line segment has one and only one mid-point. **[5]**

34. In figure, $\angle$ABC = 65º, $\angle$BCE = 30º, $\angle$DCE = 35º and $\angle$CFE = 145º. Prove that AB || EF. **[5]**

<div align="center">OR</div>

In the given figure, AB || CD, $\angle ABO = 40°$, $\angle CDO = 35°$. Find the value of the reflex $\angle$BOD and hence the value of x.


35. Verify that $x^3 + y^3 + z^3 - 3xyz$ **[5]**
$= \frac{1}{2}(x+y+z)\left[(x-y)^2 + (y-z)^2 + (z-x)^2\right]$

<div align="center">**Section E**</div>

36. **Read the text carefully and answer the questions:** **[4]**

Child labour refers to any work or activity that deprives children of their childhood. It is a violation of children's rights. This can them mentally or physically. It also exposes them to hazardous situations or stops them from going to school. Naman got data on the number of child labors (in million) in different country that is given below.
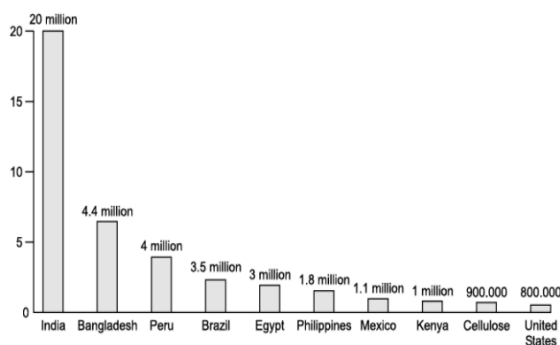
 (i) What is the difference between highest no child labor and the minimum no of child labor?

 (ii) What is the percentage of no. of child labor in Peru over the no. of child labor in India?

 (iii) What is the total no. of child labor in the countries having child labor more than 2 million?

<div align="center">**OR**</div>

 How many countries are having child labor more than Mexico?

37. **Read the text carefully and answer the questions:** **[4]**

Once four friends Rahul, Arun, Ajay and Vijay went for a picnic at a hill station. Due to peak season, they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. They

were carrying 300 m² cloth with them. As shown in the figure they made the tent with height 10 m and diameter 14 m. The remaining cloth was used for the floor.

14m / 10 m
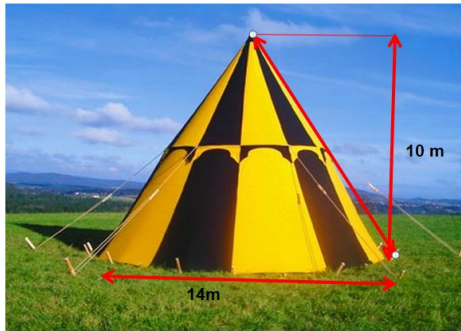
(i) How much Cloth was used for the floor?

(ii) What was the volume of the tent?

(iii) What was the area of the floor?

OR

What was the total surface area of the tent?

38. **Read the text carefully and answer the questions:** **[4]**

As shown In the village of Surya there was a big pole PC. This pole was tied with a strong wire of 10 m length. Once there was a big spark on this pole, thus wires got damaged very badly. Any small fault was usually repaired with the help of a rope which normal board electricians were carrying on bicycles.

This time electricians need a staircase of 10 m so that it can reach at point P on the pole and this should make 60° with line AC.
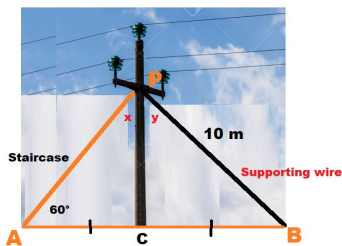
(i) Show that $\triangle$APC and $\triangle$BPC are congruent.

(ii) Find the value of $\angle$x.

(iii) What is the value of $\angle$PBC?

OR

Find the value of $\angle$y.