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## SAMPLE PAPER 4 <br> CLASS 9

SECTION - A
Question numbers 1 to 8 carry one mark each. For each question, four alternative choices have been provided of which only one is correct. You have to select the correct choice.

1. Any point on the line $y=x$ is of the form:
a. $(a, a)$
b. $(0, a)$
c. $(a, 0)$
d. $(a,-a)$
2. Age $x$ of Seema exceeds age $y$ of Shanta by seven years. This statement can be expressed as linear equation as:
a. $x+y=7$
b. $x-y=-7$
c. $x+y=-7$
d. $x-y=7$
3. Angle formed in minor segment of a circle is:
a. Acute
b. obtuse
c. right angle
d. none of these
4. In the given figure $\triangle \mathrm{ABC}$ is an equilateral triangle. $\mathrm{D}, \mathrm{E}$ and F are the mid - points of $\mathrm{AB}, \mathrm{AC}$ and BC respectively. If $\mathrm{AB}=6 \mathrm{~cm}$, then the perimeter of $\triangle \mathrm{DEF}$ is:

a. 18 cm
b. 9 cm
c. 36 cm
d. 18 cm
5. A well of diameter $\frac{r}{2}$ and height $2 h$ is dug. The inside curved surface area that is to be polished is:
a. $\pi r h$
b. $2 \pi r h+\pi r^{2}$
c. $2 \pi r h+2 \pi r^{2}$
d. $4 \pi r h$
6. The total surface area of a cone whose radius is $\frac{r}{2}$ and slant height is $2 l$ is:
a. $2 \pi r(l+r)$
b. $\pi r(l+r)$
c. $\pi r\left(l+\frac{r}{4}\right)$
d. $2 \pi r l$
7. In 1000 lottery tickets there are 5 prize winning tickets. Then the probablility of winning a prize if a person buys one ticket will be:
a. $\frac{1}{200}$
b. $\frac{1}{500}$
c. $\frac{1}{1000}$
d. $\frac{1}{20}$
8. Median of the data $5,9,8,6,3,5,7,12,15$ is
a. 3
b. 6
c. 5
d. 7

## SECTION - B

Question numbers 9 to 14 carry two marks each.
9. ABCD is a cyclic quadrilateral such that $\angle A=90^{\circ}, \angle B=55^{\circ}, \angle C=100^{\circ}, \angle D=$ $115^{0}$. Is this statement true or false? Justify your answer.
10. In a quadrilateral ABCD , two diagonals AC and BD intersect at O . If $\angle D A B=\angle B C D=$ $60^{\circ}, \mathrm{DO}=4 \mathrm{~cm}$ and $\mathrm{AO}=5 \mathrm{~cm}$, then find the value of $\mathrm{AC}+\mathrm{BD}$.

11. A solid right circular cylinder has radius 7 cm and height 20 cm . Find its total surface area. (use $\pi=\frac{22}{7}$ )
12. The mean of 100 observations is 60 . If one observation of 50 is replaced by 110 , then what will be the new mean?
13. Find the value of $p$, if the mean of the following distribution is 7.5:

| $x$ | 3 | 5 | 7 | 9 | 11 | 13 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $y$ | 6 | 8 | 15 | $p$ | 8 | 4 |

14. A and B are the only two outcomes of an event. Probability of $p(A)=0.72$, the what will be the probability of $\mathrm{p}(\mathrm{B})$ and why?

## SECTION - C

## Question numbers 15 to 24 carry three marks each.

15. Solve the equation $3 y+2=y-4$ and represent the solution(s) on:
a. The number line
b. The Cartesian plane.
16. Find the solution of the linear equation $x+2 y=4$, which represents a point on:
a. $x$-axis
b. $y$-axis

Draw graph of linear equation.
17. Prove that the straight line joining the mid - points of the diagonals of a trapezium is parallel to the parallel sides.

18. Construct a triangle ABC in which $\mathrm{BC}=5.6 \mathrm{~cm}, \angle \mathrm{~B}=30^{\circ}$ and $\angle \mathrm{C}=75^{\circ}$.
19. $P$ is a point in the interior of parallelogram $A B C D$. Show that $\operatorname{ar}(A P D)+\operatorname{ar}(P B C)=\frac{1}{2}$ $\operatorname{ar}(A B C D)$.

20. ABCD is a rectangle in which diagonal AC bisects $\angle \mathrm{A}$ and $\angle \mathrm{C}$. Prove that ABCD is a square.
21. There are two cones. The ratio of their radii are $4: 1$. Also the slant height of the second cone is twice that of the former. Find the relationship between their curved surface areas.
22. A conical tent is 10 m high and radius of its base is 24 m . Find the cost of canvas required to make the tent when cost of canvas is at the rate of Rs. 70 per $\mathrm{m}^{2}$.
23. The following table gives the distribution of students of two section according to the marks obtained by them.

| Section A |  | Section B |  |
| :---: | :---: | :---: | :---: |
| Marks | Frequency | Marks | Frequency |
| $0-10$ | 2 | $0-10$ | 5 |
| $10-20$ | 12 | $10-20$ | 11 |
| $20-30$ | 18 | $20-30$ | 15 |
| $30-40$ | 13 | $30-40$ | 12 |
| $40-50$ | 5 | $40-50$ | 7 |

Represent the marks of the students of both the sections on the same graph by two frequency polygons.
24. In a mathematics test given to 15 students the following marks (out of 100) were recorded.
$52,60,41,39,48,52,46,62,54,40,96,52,98,40,42$
Find the difference in median and mode?

## SECTION - D

## Question numbers 25 to 34 carry four marks each.

25. Find $a$ when $(1,-1)$ is a solution of the linear equation $2 x-(2 a+5) y=5$. Hence draw the graph.
26. Draw the graph of the linear equation $2(x+3)-3(y+1)=0$. Also, find the points where the line intersects the $x$-axis and $y$-axis.
27. In the figure, the diagonals of parallelogram $A B C D$ intersect in O . a line through O meets $A B$ in $X$ and opposite side in $Y$. Show that $\operatorname{ar}(A X Y D)=\frac{1}{2} \operatorname{ar}(A B C D)$.

28. In the figure, PQRS is a parallelogram and A is any point on QR . Prove that $\operatorname{ar}(\mathrm{APQ})+\operatorname{ar}(\mathrm{ASR})=\operatorname{ar}(\mathrm{PAS})$.

29. In the figure, LPEA is a parallelogram. Points $M, N$ and $O$, are taken on LP such that $\mathrm{LM}=\mathrm{MN}=\mathrm{NO}=\mathrm{OP}$ and $\mathrm{AL}\|\mathrm{BM}\| \mathrm{CN}\|\mathrm{DO}\| \mathrm{EP}$. Prove that $\operatorname{ar}(\mathrm{OPR})=\operatorname{ar}(\mathrm{ABF})$.

30. Prove that the bisectors of the angles formed by producing opposite sides of a cyclic quadrilateral (provided they are not parallel) intersect each other at right angles.
31. A man decides to make a garden in front of his house and fence it. He can have it in the shape of a rectangle or a parallelogram. He chooses rectangle over the parallelogram whose length is 10 m and width is 7 m . The cost of fencing is Rs. 1500 per metre. Answer the following questions:
a. What was the cost incurred by him?
b. Why did he choose a rectangle and not a parallelogram? Which perimeter would have been more - a rectangle or a parallelogram? Justify with the help of a figure.
c. What value of the man is shown here?
32. A dome of a building is in the form of a hemisphere. From inside it was white washed at the cost of Rs. 498.96. If the cost of white washing is Rs. 2.00 per square metre, find the volume of the air inside it.
33. The volume of a sphere is $38808 \mathrm{~m}^{3}$. Find its surface area.
34. Draw a histogram of distribution table of the marks scored by 75 students of class IX.

| Marks obtained | Number of students |
| :---: | :---: |
| $0-10$ | 4 |
| $10-20$ | 8 |
| $20-40$ | 20 |
| $40-45$ | 10 |
| $45-60$ | 12 |
| $60-70$ | 6 |
| $70-85$ | 15 |

