## K.P.CLASSES

## CLASS- IX MATHEMATICS (SA - II)

TIME - 3 HOURS
MAX. MARKS - 90

## General instructions:-

- All question are compulsory.
- The question paper consists of 34 questions divided into four sections $A, B, C$ and $D$. Section - A comprises of 8 question of 1 mark each. Section - B comprises of 6 questions of 2 marks each. Section C comprises of 10 questions of 3 marks each and Section - D comprises of 10 questions of 4 marks each.
- Question numbers 1 to 8 in Section - A are multiple choice questions where you are to select one correct option out of the given four.
- There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one If the alternatives in all such questions.
- Use of calculator is not permitted.
- An additional 15 minutes time has been allotted to read this question paper only.


## SECTION - A

1. Any point on the line $x+y=0$ is of form
a. $(a, a)$
b. $(0, a)$
c. $(a, 0)$
d. $(a,-a)$
2. The coefficient of $y$ in the equation $3(2 x-y)+x+2 y=5$ is
a. 7
b. -5
c. -1
d. 1
3. If in a sphere, volume and surface area are numerically equal, then radius will be:
a. 1
b. 3
c. 2
d. 4
4. The length of longest pole that can be put in a room of dimensions $(10 \mathrm{~m} \times 10 \mathrm{~m} \times 5 \mathrm{~m})$ is
a. 15 m
b. 16 m
c. 10 m
d. 12 m
5. If in a quadrilateral, diagonals are equal, then it cannot be a :
a. Square
c. Rhombus
b. Parallelogram
d. Rectangle
6. The median of a triangle divide it into two
a. Triangles of equal area
c. Right triangles
b. Equilateral triangles
d. Isosceles triangles.
7. A fair die is thrown. The probability that a prime number will occur is
a. $\frac{2}{3}$
b. $\frac{1}{2}$
c. $\frac{3}{5}$
d. $\frac{1}{6}$
8. If the mean of $x, x+2, x+4, x+6, x+8$ is 24 , then $x=$
a. 22
b. 21
c. 20
d. 24

## SECTION - B

9. The curved surface area of a right circular cylinder of height 14 cm is $88 \mathrm{~cm}^{2}$. Find the diameter of the base of the cylinder. Assume $\pi=22 / 7$.
10. In a cricket math, a batswoman hits a boundary 6 times out of 30 balls she plays. Find the probability that she did not hit a boundary.
11. The blood groups of 30 students of Class VIII are recoded as follows:

$$
\begin{aligned}
& A, B, O, O, A B, O, A, O, B, A, O, B, A, O, O, A, A B, O, A, A, O, O, A B, B, A, O, B, A, B, O \text {. } \\
& \text { Represent this data in the form of a frequency distribution table. }
\end{aligned}
$$

12. The following observations have been arranged in ascending order. If the median of the data is 63 , find the value of $x$. $29,32,48,50, x, x+2,72,78,84,95$
13. A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc and also at a point on the major arc.
14. In the given figure, $\angle A B C=69^{\circ}, \angle A C B=31^{\circ}$, find $\angle B D C$.


## SECTION - C

15. Give the geometric representation of $y=3$ as an equation
(I) in one variable
(II) in two variables
16. Give the equations of two lines passing through $(2,14)$. How many more such lines are there, and why?
17. A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm , the outer diameter being 4.4 cm . (i) Inner curved surface area,
(ii) Outer curved surface area,
(iii) Total surface area. [ Assume $\pi=22 / 7$ ].
18. A right triangle $A B C$ with sides $5 \mathrm{~cm}, 12 \mathrm{~cm}$ and 13 cm is revolved about the side 12 cm . Find the volume of the solid so obtained.
19. 1500 families with 2 children were selected randomly, and the following data were recorded:

| Number of girls in a family | 2 | 1 | 0 |
| :--- | :---: | :---: | :---: |
| Number of families | 475 | 814 | 211 |

Compute the probability of a family, chosen at random, having
(i) 2 girls (ii) 1 girl (iii) No girl

Also check whether the sum of these probabilities is 1.
20. The following number of goals was scored by a team in a series of 10 matches:
$2,3,4,5,0,1,3,3,4,3$
Find the mean, median and mode of these scores.
21. Construct a triangle $A B C$ in which $B C=7 \mathrm{~cm}, \angle B=75^{\circ}$ and $A B+A C=13 \mathrm{~cm}$.

Or
Construct a triangle $X Y Z$ in which $\angle Y=30^{\circ}, \angle Z=90^{\circ}$ and $X Y+Y Z+Z X=11 \mathrm{~cm}$.
22. If the diagonals of a parallelogram are equal, then show that it is a rectangle.
23. $P$ and $Q$ are any two points lying on the sides $D C$ and $A D$ respectively of a parallelogram $A B C D$. Show that $\operatorname{ar}(\mathrm{APB})=\operatorname{ar}(\mathrm{BQC})$.
24. In a triangle $A B C, E$ is the mid-point of median $A D$. Show that $\operatorname{ar}$ (BED) $=\frac{1}{4} \operatorname{ar}(A B C)$

## SECTION - D

25. If two circles intersect at two points, then prove that their centres lie on the perpendicular bisector of the common chord.
26. Prove that parallelograms on the same base and between same parallels have the same area.
27. $A B C D$ is a rhombus and $P, Q, R$ and $S$ are the mid-points of the sides $A B, B C, C D$ and $D A$ respectively. Show that the quadrilateral PQRS is a rectangle.
28. The taxi fare in a city is as follows: For the first kilometre, the fares is Rs 8 and for the subsequent distance it is Rs 5 per km. Taking the distance covered as $x \mathrm{~km}$ and total fare as Rs $y$, write a linear equation for this information, and draw its graph.
29. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units. Also read from the graph the work done when the distance travelled by the body is (i) 2 units (ii) 0 units
30. A village having a population of 4000 , requires 150 litres of water per head per day. It has a tank measuring 20 m $\mathrm{x} 15 \mathrm{~m} \times 6 \mathrm{~m}$. For how many days will the water of this tank last?
Give measures which can be taken to avoid the wastage of water.
31. Find:- (i) The lateral or curved surface area of a closed cylindrical petrol storage tank that is 4.2 m in diameter and 4.5 m high.
(ii) How much steel was actually used, if $\frac{1}{12}$ of the steel actually used was wasted in making the tank. [ Assume $\pi$ $=22 / 7]$.
32. 100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the surnames was found as follows:

| Number of letters | Number of surnames |
| :---: | :---: |
| $1-4$ | 6 |
| $4-6$ | 30 |
| $6-8$ | 44 |
| $8-12$ | 16 |
| $12-20$ | 4 |

(i) Draw a histogram to depict the given information.
(ii) Write the class interval in which the maximum number of surname lie.
33. In parallelogram $A B C D$, two points $P$ and $Q$ are taken on diagonal $B D$ such that $D P=B Q$ (see the given figure).

Show that:

a. $\quad \triangle \mathrm{APD} \cong \triangle \mathrm{CQB}$
b. $A P=C Q$
c. $\triangle \mathrm{AQB} \cong \triangle C P D$
d. $A Q=C P$
e. APCQ is a parallelogram
34. Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.

