Ashwani Gupta

Class – IX   Mathematics

GENERAL INSTRUCTIONS:

1.   *All questions are compulsory.*

2.   *The question paper consists of thirty four questions divided into four sections A, B, C & D. Section A comprises of ten questions of 01 marks each, Section B comprises of eight questions of 02 marks each, Section C comprises of ten questions of 03 marks each and section D comprises of six questions of 04 marks each.*

3.   *All questions in section A are multiple choice questions where you are to select one correct option out of given four.*

4.   *There is no overall choice. However internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 04 mark each. You have to attempt only one of the alternatives in all such questions.*

5. *Use of calculators is not permitted.*

Section – 'A'

1.   The equation of x & y axes are:
     (a) x=0 & y=0 respectively   (b) x=-1 & y=-1 respectively
     (c) x=y   (d) x=0 & y=1 respectively

2.   ABCD is a parallelogram & X & Y are the midpoints of sides AB & CD respectively then the quadrilateral AXCY is:
     (a) a parallelogram   (b) a rectangle
     (c) a rhombus   (d) a square

3.   AD is a median of a triangle ABC, area of triangle ADC=15cm², then ar(ΔABC) is:
     (a) 15cm²   (b) 22.5cm²
     (c) 30cm²   (d) 37.5cm²

4.   In the fig., A, B, C, D lies on a line 'l'
     respectively to intersect the concentric circles
     with centre O, therefore:
     (a) AC=BD   (b) AD-CD=AD-AB
     (c) PD=AC   (d) AB>CD

5.   Slant height of a cone is 34cm & base diameter is 32cm, the height of cone is:
     (a) 33cm   (b) 25cm
     (c) 30cm   (d) 27cm

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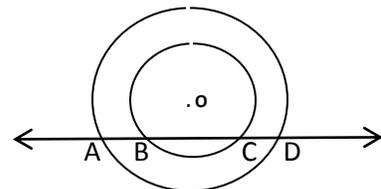
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6. The percentage of marks obtained by a student in the monthly unit tests are given below:

Unit Test	I	II	III	IV	V
% of marks obtained	58	64	76	62	85

The probability that the student gets less than 65% marks is:

(a) 0.39   (b) 0.4

(c) 0.8   (d) 0.41

7. The graph of the equation y=a is a straight line parallel to:

(a) x-axis   (b) y axis

(c) both axis   (d) all of these

8. Given ar(||gm ABCD)=25cm² & ar(ΔBCD)=xcm², then the value of x is:

(a) 25cm²   (b) 12.5cm

(c) 12.5cm²   (d) 25cm

9. Given a quadrilateral ABCD such that ∠C=90° and the diagonals AC & BD bisect each other at o, then the quadrilateral is a:

(a) rhombus   (b) trapezium

(c) parallelogram   (d) rectangle

10. In the given fig.,
∠CBD is equal to:

(a) 55°   (b) 45°

(c) 110°   (d) 75°
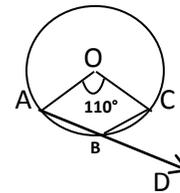
Section – 'B'

11. Find the value of k, if $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = k$.

12. Prove that a diagonal of a parallelogram divides it into two congruent triangles.

13. ABC is an isosceles triangle in which AB = AC. AD bisects exterior angle PAC and CD || AB. Show that ABCD is a parallelogram.

14. If two circles intersect at two points, prove that their centres lie on the perpendicular bisector of the common chord.

15. If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to corresponding segments of the other chord

OR

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

16. The floor of a rectangular hall has a perimeter 250 m. If the cost of painting the four walls at the rate of Rs 10 per m² is Rs 15000, find the height of the hall.

17. A cylindrical pillar is 50 cm in diameter and 3.5 m in height. Find the cost of painting the curved surface of the pillar at the rate of Rs. 12.50 per m²

18. Find the mean of the first 5 prime odd numbers.

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Section – 'C'

19. The taxi fare in a city is as follows: For the first kilometer, the fares is Rs 8 and for the subsequent distance it is Rs 5 per km. Taking the distance covered as x km and total fare as Rs y, write a linear equation for this information, and draw its graph.

20. Give the geometric representations of $2x + 9 = 0$ as an equation
    a. in one variable   b. in two variables

21. Show that the bisectors of angles of a parallelogram form a rectangle

22. Show that if the diagonals of a quadrilateral are equal and bisect each other at right angles, then it is a square

Or

In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP = BQ$
Show that: APCQ is a parallelogram

23. Construct a triangle ABC, in which $\angle B = 60°, \angle C = 45°$ and $AB + BC + CA = 11\ cm.$

24. What length of tarpaulin 3 m wide will be required to make conical tent of height 8 m and base radius 6 m? Assume that the extra length of material that will be required for stitching margins and wastage in cutting is approximately 20 cm $(Use\ \pi = 3.14)$.

OR

The capacity of a cuboidal tank is 50000 litres of water. Find the breadth of the tank, if its length and depth are respectively 2.5 m and 10 m.

25. A river 3 m deep and 40 m wide is flowing at the rate of 2 km per hour. How much water will fall into the sea in a minute?

26. 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

Draw a histogram to depict the given information.

27. The percentage of marks obtained by a student in the monthly unit tests are given below:

Unit test	I	II	III	IV	V
Percentage of marks obtained	69	71	73	68	74

Based on this data, find the probability that the student gets more than 70% marks in a unit test.

28. Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardized conditions favorable to germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follows:

Bag	1	2	3	4	5
Number of seeds Germinated	40	48	42	39	41

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What is the probability of germination of
  i.   More than 40 seeds in a bag?
  ii. 49 seeds in a bag?
  iii. More that 35 seeds in a bag?

Section – 'D'

29. In countries like USA and Canada, temperature is measured in Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius:

$$F = \frac{9}{5}C + 32$$

Is there a temperature which is numerically the same in both Fahrenheit and Celsius? If yes, find it.

OR

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 unit

30. *Prove that Parallelograms on the same base and between the same parallels are equal in area.*

31. 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.

32. ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that

    (i) D is the mid-point of AC   (ii) MD ⊥ AC

    (iii) CM = MA $=\frac{1}{2}AB$

OR

Show that the line segments joining the mid-points of the opposite sides of a quadrilateral bisect each other.

33. 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 inside surface area of the dome, (ii) volume of the air inside the dome.

34. 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

OR

Find the mode of 14, 25, 14, 28, 18, 17, 18, 14, 23, 22, 14, 18.

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Answers:

1. a
2. a
3. c
4. b
5. c
6. b
7. a
8. c
9. d
10. a

All questions of section B, C and D are from NCERT. Check your answers from your textbook.

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