

**Sample Paper S.A 2nd
Mathematics - IX
2011 - 2012**

Time : 3 or 3 ½ hours

Maximum Marks : 90

General Instructions:

1. All questions are compulsory.
2. The question paper consists of 34 questions divided into four sections - A, B, C and D. Section - A contains 8 questions of 1 mark each, Section B is of 6 questions of 2 marks each, Section C is of 10 questions of 3 marks each and section D is of 10 questions of 4 marks each.
3. In question of construction, the drawing should be neat and exactly as per the given measurements.
4. Use of calculator is not permitted..

SECTION – A

1. ABCD is a parallelogram and X and Y are the mid – points of sides AB and CD respectively. Then the quadrilateral AXCY is
 - i. a parallelogram
 - ii. a rectangle
 - iii. a rhombus
 - iv. a square
2. The graph of the linear equation $4x = 5$ is
 - i. Parallel to x – axis
 - ii. Lies along x – axis
 - iii. Parallel to y – axis
 - iv. passes through origin
3. Diagonal of a cube is $\sqrt{6}$ cm. Then its lateral surface area is :
 - i. $6\sqrt{6}\text{cm}^2$
 - ii. 36 cm^2
 - iii. 12 cm^2
 - iv. 8 cm^2
4. In a class of 40 students. There are 110 % girls. Then the number of girls is :
 - i. 44
 - ii. 22
 - iii. 30
 - iv. None of these
5. AD is the diameter of a circle and AB is a chord. If $AD = 34\text{ cm}$, $AB = 30\text{ cm}$, the distance of AB from the centre of the circle is :
 - i. 17 cm
 - ii. 15 cm
 - iii. 4 cm
 - iv. 8 cm
6. The equation of x – axis is
 - i. $x + y = 0$
 - ii. $x - y = 0$
 - iii. $y = 0$
 - iv. $x = 0$
7. Mean of 20 observations is 15.3. Later it was found that the observation 24 was misread as 42. The corrected mean is :
 - i. 14.2
 - ii. 14.8
 - iii. 14.0
 - iv. 14.6
8. A conical tent is to accommodate 11 persons. Each person requires 4 square metres of the space on the ground and 20 cubic metres of air to breathe, then the height of the cone is :
 - i. 10
 - ii. 12 m
 - iii. 15 m
 - iv. 18 m

SECTION – B

9. Circumference of the base of a right circular cone is 88 cm. If height of the cone is 10 cm then, find its volume.
10. ABCD is a trapezium with $AB \parallel CD$, E is the mid – point of side AD. A line through E parallel to AB meets BC in F. Show that F is the mid – point of BC.
11. For a Mathematics test given to 15 students, the following marks(out of 100) are recorded : 41, 39, 48, 52, 46, 62, 54, 40, 96, 60, 52, 30, 52, 94, 56. Find mean and median.
12. In a class there are x boys and y girls, a student is selected at random, find the probability of selecting:
 - (a) a girl
 - (b) both boy and girl.
13. ABCD is a parallelogram $AE \perp DC$ and $CF \perp AD$, if $AB = 8\text{ cm}$ and $CF = 10\text{ cm}$. Find AD, if $AE = 8\text{ cm}$.
14. Class marks of a distribution are 35, 40, 45, 50, 55, 60, 65. Determine the class size and class limit.

SECTION – C

15. In triangle ABC, the median BE and CF of a triangle intersect at G. Prove that area of $\Delta GBC =$ area of quadrilateral AFGE.

16. Construct a ΔABC in which $BC = 5.6$ cm, $AC - AB = 1.6$ cm and $\angle B = 45^\circ$.
17. The slant height and base diameter of a conical tomb are 25 m and 14 m respectively. Find the cost of white – washing its curved surface at the rate of Rs 210 per 100 m^2 .
18. The following data are given in ascending order 20, 25, 28, 30, x, x + 2, 40, 45, 50, 52 if their median is 36 then find the value of x. If the number 35 is replaced by 53 then find its new median.
19. When 5 times the larger of the two numbers is divided by the smaller, the quotient and the remainder are 2 and 9. Form the linear equation in two variables for above and give its two solutions.
20. If ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$, prove that $\angle A = \angle B$.

OR

Prove that the quadrilateral formed by the bisectors of the angles of a parallelogram is a rectangle.

21. In a frequency distribution, the mid-value of a class is 20 and the width of the class is 8. Find lower limit of the class.
22. A class room is 10m long, 6.4m wide and 5m high. If each student be given 1.6 m^2 of the floor area, how many students can be accommodated in the room? How many cubic metres of air would each student get?

OR

The diameter of a roller 120 cm long is 84 cm. If it takes 500 complete revolutions to level a playground, determine the cost of leveling it at the rate of 30 paise per square metre.

23. Find three solutions of equation $2x + 3(y - 1) = 13$. How many solutions this equations has?.
24. The diagonals of a parallelogram ABCD intersect at point O. Through O, a line is drawn to intersect AD at P and BC at Q. Show that PQ divides the parallelogram into two parts of equal areas.

OR

A point E is taken on the side BC of a parallelogram ABCD. AE and DC are produced to meet at F. Prove that $\text{ar}(\Delta DF) = \text{ar}(\Delta BFC)$.

SECTION - D

25. AB and AC are two chords of a circle of radius r such that $AB = 2 AC$. If p and q are the distances of AB and AC from the centre. Prove that $4q^2 = p^2 + 3r^2$.
26. The taxi fare in a city is as follow: for the first kilometer, the fare is Rs 8 and for the subsequent distance it is Rs 5 per km. Taking the distance covered as x km and the total fare as Rs y, write a linear equation for this information and draw its graph.
27. Prove that parallelogram on the same base and between the same parallels are equal in areas.
Using the above theorem, find area of $\parallel \text{gm } BCEF$, if ABCD and BCEF are on the same base BC and between same parallel line $AE \parallel BC$ and $\text{ar}(\Delta ADC) = 40 \text{ cm}^2$.
28. A building has 8 pillars each having diameter 50 cm and height 3.5 m. Find the cost of painting their curved surfaces at the rate of Rs 12.50 per square metre.
29. In a parallelogram ABCD, E and F are the mid – points of side AB and CD. Prove that the line segments AF and CE trisect the diagonal BD.
30. Draw the line $x = 4$, $y = 2$ and $x = y$, on the same graph paper and then identify what type of figure obtained? Also write the point of vertices of this figure formed.
31. Prove that the sum of either pair of opposite angles of a cyclic quadrilateral is 180.
Using the above theorem, prove that the sum of the angles formed in the four exterior to a cyclic quadrilateral by the sides is equal to six right angles.
32. Construct a triangle ABC, if its perimeter is 10.4 cm and base angles 45 and 120.
33. A semi circular sheet of metal of diameter 28 cm is bent to form an open conical cup. Find the capacity of the cup.

OR

A lead pencil consists of a cylinder of wood with a solid cylinder of graphite filled in the interior. The diameter of the pencil is 7 mm and the diameter of graphite is 1 mm. if the length of the pencil is 14 cm. find the volume of wood and that of graphite.

34. The mean of the following distribution is 50. Find the value of a.

C.I (km/h)	10	30	50	70	100
Frequency	17	$5a + 3$	32	$7a - 11$	19

"The best way to predict your future is to create it." : Mohan Singh

Answer Key

Section A

1. i. a parallelogram
2. iii. Parallel to y – axis
3. iv. 8 cm^2
4. iv. None of these
5. iv. 8 cm
6. iii. $y = 0$
7. iv. 14.6
8. iii. 15 m

Section B

9. 2053.33 cm^3
11. Mean = 54.8, Median = 52
12. (a) $y / x + y$ (b) 1
13. 6.4 m

Section C

17. Rs 1155
18. $x = 35$, median = 38.5
19. $5x - 2y = 9$, (0, 4.5), (2, - 0.5)
21. 16
22. 40, 8 m^3 or Rs 475.20
23. (5,2),(2,4),(-1,6). Infinitely many solutions

Section - D

26. $5x - y + 3 = 0$, (0, 3), (1, 8)
28. Rs 550
33. 622.16 cm^3 or 5.28 cm^3 , 0.11 cm^3
35. $a = 5$

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