

Class : IX

(Max. Marks : 80)

Time : 2.45 Hrs.

INSTRUCTIONS :

1. The question paper is given as Booklet.
2. All the questions are multiple choice questions.
3. Use Blue / Black ink ball point pen to answer all the questions in OMR sheet.
4. Identify the correct answer and bubble the relevant circle given against the question number in OMR Sheet.

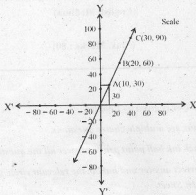
Ex : If the answer is 3 to the question, bubble as shown ① ② ● ④.

5. The Answer Paper is not valued if ✓, × symbols used as answers.
6. The answer paper is not valued for over-writing and more than one answer is bubbled.
7. Answer all the questions in the given time and hand over the OMR sheet to the invigilator.

Instructions : From the adjacent graph, answer the following questions (Q. No. 1-5) :

In a school students prepared toilet cleaning acid by taking acid and water as shown in the graph.

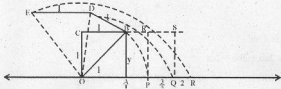
The quantity of acid taken and water are shown along X, Y axis respectively.



- What is the scale factor used on X-axis ?
 - 5 Units
 - 10 Units
 - 20 Units
 - 1 Unit
- Above given information represent as linear equation in two variables :
 - $y = 3x$
 - $3x = 4y$
 - $4x = 3y$
 - $x = 3y$
- If the quantity of acid is 20 then the quantity of water in units
 - 40
 - 20
 - 10
 - 60
- In the diluted acid water quantity is 45 then the quantity of concentrated acid in units.
 - 30
 - 90
 - 135
 - 15
- What is the percentage of water in the diluted acid ?
 - 25
 - 33.3
 - 75
 - 20

Instructions : Observe the number line and give answer from Q. No. 6-10.

In the number line at 'O' draw a unit square OABC with each side 1 unit in length and $OB = OP$, $OD = OQ$, $OE = OR$.



Observe above number line and answer the following :

6. The length of \overline{OP} is

(1) $\frac{3}{2}$ Units

(2) $\sqrt{2}$ Units

(3) $\sqrt{3}$ Units

(4) 1 Unit

7. The length of \overline{AQ} is

(1) $\sqrt{3} - 1$ Units

(2) $\sqrt{3} + \sqrt{2}$ Units

(3) $\sqrt{3} - \sqrt{2}$ Units

(4) $\sqrt{3} + 1$ Units

8. Perimeter of the rectangle OCSQ

(1) $2(\sqrt{3} + 1)$ Units

(2) 6 Units

(3) $2(\sqrt{2} + \sqrt{3})$ Units

(4) $2(\sqrt{2} + 1)$ Units

9. Area of rectangle PQRS in sq.units

(1) $\sqrt{3} - 1$

(2) $\sqrt{3} + \sqrt{2}$

(3) $\sqrt{3} - \sqrt{2}$

(4) $\sqrt{2} - 1$

10. $\sqrt{5}$ lies between

(1) 1 and 2

(2) 2 and 3

(3) 3 and 4

(4) 0 and 1

11-15 Questions :

- I. $(a + b)^2 = a^2 + 2ab + b^2$
II. $(a - b)^2 = a^2 - 2ab + b^2$
III. $(a + b)(a - b) = a^2 - b^2$
IV. $(x + a)(x + b) = x^2 + (a + b)x + ab$
V. $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$
VI. $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$
VII. $(a - b)^3 = a^3 - b^3 - 3ab(a - b)$

Without actual multiplication which algebraic identity can be used to find the following :

11. 99×99

- (1) II (2) III
(3) I and II (4) I

12. 103×97

- (1) II (2) III
(3) IV (4) I

13. Expand $(2a - 3b + 4c)^2$

- (1) $4a^2 - 9b^2 + 16c^2 - 12ab - 24bc + 16ac$
(2) $4a^2 + 9b^2 + 16c^2 - 12ab - 24bc - 16ca$
(3) $4a^2 - 9b^2 - 16c^2 - 12ab - 24bc + 16ca$
(4) $4a^2 + 9b^2 + 16c^2 - 12ab + 24bc + 16ac$

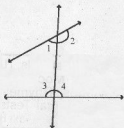
14. $1 - 64a^3 - 12a + 48a^2$ is obtained by using which of the following identity :

- (1) IV (2) V
(3) VII (4) III

15. $x^2 - 5x + 6$

- (1) $(x - 3)(x - 2)$ (2) $(x + 3)(x + 2)$
(3) $(x - 3)(x + 2)$ (4) $(x + 3)(x - 2)$

16. In the adjacent figure, according to Euclid's 5th postulate, the pair of angles having the sum less than 180° is



- (1) 2 and 4
 (2) 1 and 3
 (3) 3 and 4
 (4) 1 and 2
17. The angles of a triangle are in the ratio 5 : 3 : 7 then the triangle is
- (1) An obtuse angled triangle
 (2) Right angle triangle
 (3) An Isosceles triangle
 (4) An acute angled triangle

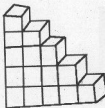
18.

x	0	1	2	3	4
y	2	4	6	8	10

Which of the following linear equations represent the co-ordinate points given in the table ?

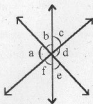
- (1) $2y + 2 = x$
 (2) $2x = y + 2$
 (3) $2x - y = 2$
 (4) $2x + 2 = y$
19. The equation $2x + 5y = 7$ has a unique solution, if x, y are
- (1) Positive real numbers
 (2) Real numbers
 (3) Rational numbers
 (4) Natural numbers
20. In a cylinder, if radius is halved and height is doubled, then volume will be
- (1) Doubled
 (2) Halved
 (3) Four times
 (4) Same
21. The length of the longest flag pole that can be put in a store room of dimensions $10\text{ m} \times 10\text{ m} \times 5\text{ m}$ is
- (1) 16 m
 (2) 10 m
 (3) 12 m
 (4) 15 m

Akshra playing with building blocks, which are of the shape of cubes, has built a structure as shown in given figure. If the edge of each cube is 3 cm then answer the following questions from 22 to 25 :

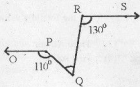


22. The volume of the structure built by Akshra
- (1) 305 cm^3 (2) 405 cm^3
 (3) 505 cm^3 (4) 205 cm^3
23. If Akshra formed a cuboid using all that cubes then the total surface area of cuboid is
- (1) 177 cm^2 (2) 354 cm^2
 (3) 405 cm^2 (4) 144 cm^2
24. Minimum number of small cubes further more required to form a cube
- (1) 12 (2) 36
 (3) 48 (4) 8
25. If the ratio of volumes of two cubes is 8 : 27 then ratio of their total surface areas is
- (1) 2 : 3 (2) 3 : 2
 (3) 3 : 1 (4) 1 : 3
26. When two straight lines interact then
- (i) Adjacent angles are complementary
 (ii) Adjacent angles are supplementary
 (iii) Opposite angles are equal
 (iv) Opposite angles are supplementary
- By the above statements which are correct ?
- (1) (ii) and (iii) (2) (i) and (iv)
 (3) (ii) and (iv) (4) (i) and (iii)

27. From the adjacent figure which of the following statement must be true ?
- (a) $a + b = c + d$;
 (b) $a + c + e = 180^\circ$
 (c) $b + f = c + e$



- (1) a and b
 (2) c and a
 (3) b and c
 (4) only a
28. **Assertion (A)** : $6x^5 + 5x^4 + 3x^2 + \frac{4}{x} + 5$ is a polynomial of degree 5.
Reason (R) : Exponent of 'x' is negative integer, it is multinomial.
- (1) Both A and R are true but 'R' is not correct explanation of A.
 (2) A is correct, R is incorrect.
 (3) A is incorrect, R is correct.
 (4) Both A and R are true and 'R' is the correct explanation of A.
29. **Statement (A)** : A linear equation $2x + 3y = 5$ has a unique solution.
Statement (B) : The line parallel to the Y-axis at a distance 4 units to the left of Y-axis is given by the equation $x = -4$.
Statement (C) : The graph of the equation $y = mx + c$ passes through the origin.
 By the above statement which of the following are correct ?
- (1) B and C are true, A is false.
 (2) B and C are false, A is true.
 (3) B is true and A and C are false.
 (4) A and B are true, C is false.
30. In the adjacent figure, $OP \parallel RS$, $\angle OPQ = 110^\circ$ and $\angle QRS = 130^\circ$ then $\angle PQR$ is equal to



- (1) 50°
 (2) 60°
 (3) 70°
 (4) 40°

31. Match the following group A to B. Choose correct mapping of the following :

Group-A

- (i) $(a+b)^2 - (a-b)^2$
 (ii) $(a+b)^2 + (a-b)^2$
 (iii) $(a+b)^2 - (a^2 + b^2)$

Group-B

- A. $2(a^2 + b^2)$
 B. $2ab$
 C. $4ab$

Choose the correct answer :

- (1) (i) - B, (ii) - C, (iii) - A
 (2) (i) - C, (ii) - A, (iii) - B
 (3) (i) - C, (ii) - B, (iii) - A
 (4) (i) - A, (ii) - B, (iii) - C

32.

Column - I

- (i) The equation of x - axis is
 (ii) The equation of a line parallel to y-axis is
 (iii) The equation of a line passing through origin is

Column - II

- P. $x = k$
 Q. $y = 0$
 R. $y = x$
 S. $x = 0$

Choose correct matching from column - I to column - II.

- (1) (i) - Q, (ii) - S, (iii) - Q
 (2) (i) - Q, (ii) - P, (iii) - R
 (3) (i) - Q, (ii) - P, (iii) - S
 (4) (i) - S, (ii) - R, (iii) - P

33. The radius of the sphere is $2x$, then its volume will be

- (1) $4\pi x^3$
 (2) $\frac{8\pi}{3} x^3$
 (3) $\frac{32}{3} \pi x^3$
 (4) $\frac{4}{3} \pi x^3$

34. A pyramid is a three dimensional figure the base of which is

- (1) Only a square
 (2) Only a rectangle
 (3) Any polygon
 (4) Only a triangle

35. It is known that if $a + b = 9$ then $a + b + z = 9 + z$ the Euclid's axiom that illustrates this statement is

- (1) Second Axiom
 (2) Third Axiom
 (3) Fourth Axiom
 (4) First Axiom

36. The degree of the polynomial $(x^3 + 7)(3 - x^2)$ is

- (1) 3
 (2) 5
 (3) 6
 (4) 2

37. The steps from solids to points are
- (1) solids - lines - surface - points
 - (2) lines - points - surface - solids
 - (3) lines - surface - points - solids
 - (4) solids - surface - lines - points

38. The linear equation that converts Fahrenheit (F) to Celsius (C) is given by the relation

$$C = \frac{5F - 160}{9}$$

What is the numerical value of temperature which is same in both the scale ?

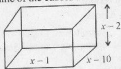
- (1) 30°
 - (2) -40°
 - (3) 40°
 - (4) -30°
39. The autorikshaw fare in a city is charged ₹ 8 for the first kilometre and ₹ 4 per kilometre for subsequent distance covered. If distance 'x' km and for charged 'y' then this information express as a linear equation in two variables is

- (1) $y = 4(x + 1)$
- (2) $y = 4x + 8$
- (3) $y = 4x - 8$
- (4) $y = 4(x - 1)$

40. A Rectangular park dimensions are $(3 + \sqrt{2})$ and $(2 + \sqrt{2})$ units then the area of that park in square unit.

- (1) $8 + 5\sqrt{2}$
- (2) $5 + 2\sqrt{2}$
- (3) $13\sqrt{2}$
- (4) $5 + \sqrt{2}$

41. If length, breadth and height of the cuboid are $(x - 1)$, $(x - 10)$ and $(x - 12)$ units then volume of the cuboid in cubic units



- (1) $x^3 + 23x^2 - 142x + 120$
- (2) $x^3 - 23x^2 + 142x - 120$
- (3) $x^3 - 23x^2 - 142x + 120$
- (4) $x^3 + 23x^2 - 142x - 120$

42. The ratio of molecular weight of hydrogen and oxygen in water is 1 : 8. (The relation between hydrogen and oxygen in linear equations in two variables is). If the quantities of hydrogen and oxygen are 'x' and 'y'.

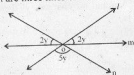
- (1) $y = 8x$
- (2) $x + y = 8$
- (3) $xy = 8$
- (4) $x = 8y$

43. A one side open cylindrical drum has inner radius 28 cm and height 2.1 m. then how much water store in the drum in litres ?



(Hint :- 1000 cubic cm. = 1 litre)

- (1) 517.44
(2) 51.744
(3) 51744
(4) 5174.40
44. If l , m and n are three lines concurrent at 'O' then the value of 'y'.



- (1) 40°
(2) 60°
(3) 100°
(4) 20°
45. Tushar's age is the same as Karthik's. Satwik's age is also same as Karthik. State the Euclid's axiom that illustrate the relative ages of Tushar and Satwik.
- (1) Second Axiom
(2) Third Axiom
(3) Fourth Axiom
(4) First Axiom
46. On a particular day, the rainfall recorded in a terrace of dimensions 6 m and 5 m is 15 cm. The quantity of water collected in terrace is
- (1) 450 litres
(2) 3000 litres
(3) 4500 litres
(4) 300 litres
47. The cost of construction of a wall 8 m long, 4 m height and 20 cm thick at the rate of ₹ 25 per m^3 is
- (1) ₹ 80
(2) ₹ 160
(3) ₹ 320
(4) ₹ 16
48. If two interior angles on the same side of transversal intersecting two parallel lines are in the ratio 2 : 3 then the greater of two angles is
- (1) 108°
(2) 120°
(3) 136°
(4) 54°

49. The value of 1.999 in the form of $\frac{p}{q}$ (p, q are integers, $q \neq 0$)

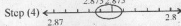
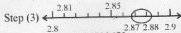
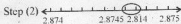
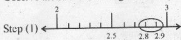
(1) $\frac{1999}{1000}$

(2) 2

(3) $\frac{1}{9}$

(4) $\frac{19}{10}$

50. Observe the successive magnification of 2.8746 on the number line.



Arrange these steps orderly

(1) 1, 3, 4, 2

(2) 3, 4, 2, 1

(3) 3, 4, 1, 2

(4) 1, 2, 4, 3

51. What is the minimum number of lines required to make a closed figure ?

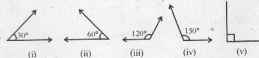
(1) 2

(2) 3

(3) 4

(4) 1

52. Which pair of the following angles become supplementary angle ?



(1) (ii) and (iii)

(2) (ii) and (iv)

(3) (i) and (ii)

(4) (i) and (iii)

53. Which of the following is the solid combination of cylinder and cone ?

(1) Capsule

(2) Ice cream

(3) Rocket

(4) Top

54. Which Geometrical figure related to Algebraic Identity $(x - y)^2 = x^2 + y^2 - 2xy$?



55. The graph of $y = 6$ is a line

- (1) Parallel to y-axis at a distance 6 units from the origin.
 (2) Making an intercept 6 on the x-axis.
 (3) Making an intercept 6 on both the axis.
 (4) Parallel to x-axis at a distance 6 units from the origin.

56. The point of the form (a, a) always lies on

- (1) y-axis
 (2) On the line $y = x$
 (3) On the line $x + y = 0$
 (4) x-axis

57. The graph of the linear equation $2x + 3y = 12$ at what points cuts the X-axis and Y-axis ?

- (1) $(0, 4), (6, 0)$
 (2) $(4, 0), (0, 6)$
 (3) $(0, 2), (3, 0)$
 (4) $(2, 0), (0, 3)$

58. Which of the following graph represents the linear equation $x + y = 0$?



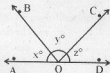
59. Which of the following represent a line parallel to x-axis ?

- (1) $2x + y = 7$
 (2) $2y - 3 = y + 1$
 (3) $x + 3 = 0$
 (4) $x + y = 3$

60. Which of the two lines are not parallel ?



61. If ' x ' is a positive real number and $x^2 = 2$ then the value of x^3 is
 (1) $2\sqrt{2}$ (2) $3\sqrt{2}$
 (3) 4 (4) $\sqrt{2}$
62. If $\sqrt{10} = 3.162$, then the value of $\frac{1}{\sqrt{10}}$ is
 (1) 31.62 (2) 3.162
 (3) 0.3162 (4) 316.2
63. If $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ and $y = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$ then the value of $x + y$ is
 (1) 5 (2) $5 + 2\sqrt{6}$
 (3) 10 (4) $5 - 2\sqrt{6}$
64. If ' 2 ' is the zero of the polynomial $P(x) = 2x^2 - 3x + 7a$ then the value of ' a ' is
 (1) $-\frac{2}{7}$ (2) $\frac{7}{2}$
 (3) $-\frac{7}{2}$ (4) $\frac{2}{7}$
65. If $a + b + c = 6$ then the value of $(2 - a)^3 + (2 - b)^3 + (2 - c)^3 - 3(2 - a)(2 - b)(2 - c)$ is
 (1) -1 (2) 1
 (3) 2 (4) 0
66. The remainder when $x^{101} + 101$ is divided by $x + 1$ is
 (1) 1 (2) 100
 (3) 101 (4) 0
67. If a point ' B ' lies between A and C such that $\overline{AB} = \overline{BC}$ then length of \overline{AB} is equal to
 (1) $\frac{1}{2} \overline{AC}$ (2) $2 \overline{BC}$
 (3) \overline{AC} (4) $\frac{1}{2} \overline{BC}$
68. In the adjacent figure, $\angle AOB = x^\circ$, $\angle BOC = y^\circ$, $\angle COD = z^\circ$ and $\frac{y}{x} = 5$, $\frac{z}{x} = 4$ then the value of ' x ' is



- (1) 12 (2) 15
 (3) 18 (4) 8

69. The difference of supplementary and conjugate angles of ' x ' is

- (1) 180° (2) 270°
 (3) 360° (4) 90°

70. From the adjacent figure, the value of $x + y$ is



- (1) 110° (2) 140°
 (3) 170° (4) 30°

71. In $\triangle ABC$, $\angle A = 40^\circ$. If \overrightarrow{BO} and \overrightarrow{CO} are the bisectors of $\angle B$ and $\angle C$ then the value of $\angle BOC$ is



- (1) 110° (2) 70°
 (3) 40° (4) 140°

72. From the adjacent figure $PQ \parallel RS$, $\angle RPQ = 52^\circ$, $\angle RPS = 65^\circ$, $\angle PSR = x^\circ$ and $\angle PRQ = 3y^\circ + 5$ then the value of $x + y$ is



- (1) 117 (2) 137
 (3) 200 (4) 74

73. If the surface area of sphere is 154 cm^2 then its radius in cms.

- (1) 7 (2) 14
 (3) 21 (4) $\frac{7}{2}$

74. The total surface area of a cube is 96 cm^2 then its volume is

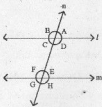
- (1) 27 cm^3 (2) 64 cm^3
 (3) 512 cm^3 (4) 8 cm^3

75. A hemispherical bowl has a radius of 3.5 cm then its curved surface area is

- (1) 77 cm^2 (2) $\frac{231}{2} \text{ cm}^2$
(3) $\frac{539}{6} \text{ cm}^2$ (4) $\frac{77}{2} \text{ cm}^2$

Instructions : From the adjacent figure, answer the following questions from 76-80.

In the adjacent figure, $l \parallel m$, 'n' is transversal



76. If $\angle B = 100^\circ$ then $\angle C + \angle E$ is

- (1) 100° (2) 160°
(3) 200° (4) 80°

77. Reason for the sum of angles A and H are 180° is

- (1) They are co-exterior angles.
(2) They are corresponding angles.
(3) They are alternative exterior angles.
(4) They are alternative interior angles.

78. An example for a pair of co-interior angles are

- (1) $(\angle D, \angle E)$ (2) $(\angle C, \angle D)$
(3) $(\angle E, \angle F)$ (4) $(\angle C, \angle E)$

79. If $\angle C = 3x$, $\angle F = 2x + 10$ then the ratio of $\angle E : \angle D$

- (1) 3 : 2 (2) 3 : 7
(3) 7 : 3 (4) 2 : 3

80. If \overrightarrow{BX} and \overrightarrow{FY} are angle bisectors of $\angle B$ and $\angle F$ respectively then \overrightarrow{BX} and \overrightarrow{FY} are

- (1) Co-incident lines
(2) Parallel lines
(3) Perpendicular lines
(4) Intersecting lines