PART-A

Time : 60 Minutes] July 2013 *[Total Marks : 50*

Instructions : (1) There are **50** objective type questions in this part and **all** are **compulsory.**

(2) The questions are serially numbered from **1** to **50** and each carries **1** mark.

(3) You are supplied with separate OMR sheet with the alternatives (A) ○ (B) ○ (C) ○ (D) ○ against each question number. For each question, select the correct alternative and darken the circle ○ as ● completely with the pen against the alphabet corresponding to that alternative in the given OMR sheet.

- From the following **1** to **50** questions, select the correct alternative from the given four answrs and darken the circle with pen against the alphabet, against the number in OMR sheet.
- Each question carries **1** mark.

1. The volume of a sphere is 36 n π cm^3. Then its diameter is ..... .

(A) 9 (B) 3 (C) 12 (D) 6

2. The volume of hemisphere with radius 1.5 cm is ..... cm^3.

(A) 2.25π (B) 9π (C) 7.5π (D) 4.5π

3. For some data, if $\Sigma f_i x_i = 75$ and $\Sigma f_i = 12$, then $\bar{x}$ = ...

(A) 6.5 (B) 5.25 (C) 6.25 (D) 10.5

4. To draw a cumulative frequency curve we always take ..... on Y-axis.

(A) Mid value of the class (B) Cumulative frequency

(C) Upper boundary of the class (D) Frequency

5. For data set, Mode Z = 25 and mean $\bar{x}$ = 25, then median M = ...

(A) 0 (B) 50 (C) 25 (D) 75

6. Two balance dies are rolled the probability of getting the same number on both dice is ..... .

(A) 1 (B) $\frac{1}{12}$ (C) $\frac{1}{6}$ (D) $\frac{1}{36}$

7. If P(A) = 0.75 then $P(\overline{A})$ = ...

(A) 0 (B) 0.25 (C) 1 (D) 25

8. 5^n ($n \in N$) ends with ..... .

(A) 4 (B) 0 (C) 5 (D) 2

9. If g.c.d. (a, b) = 12, l.c.m. (a, b) ..... is not possible:

(A) 90 (B) 24 (C) 48 (D) 36

10. The degree of the polynomial $P(x) = 7 - 5x^3 - 3x^2 + 2x$ is ..... .

(A) 7 (B) 2 (C) 3 (D) 1

11. The graph of $P(x) = x^2 - 4x + 3$ represents ..... .

(A) a line segment (B) parabola (C) a line (D) a ray

γ = ...

(A) 0 (B) 2 (C) 1 (D) –3

13. If $2x^3 - x^2 - 2x - 8$ is divided by $x - 2$ then quotient polynomial will be ..... .

(A) $x^2 - 3x + 2$ (B) $2x^2 - 3x - 4$ (C) $2x^2 - 3x + 4$ (D) $2x^2 + 3x + 4$

14. Among given linear pairs of equation which pair has infinitely many solutions ?

(A) $2x + 4y = 8$ and $x + 2y = -4$ (B) $2x + 4y = 8$ and $x + 2y = 4$

(C) $2x + 4y = 8$ and $2x + 4y = 6$ (D) $2x + 4y = 8$ and $x + 2y = 8$

15. If in a two digit number, the digit at unit place is x and the digit at tens place is 4, then the number is ..... .

(A) $10x + 4$ (B) $4x$ (C) $x + 40$ (D) $5x$

16. The standard form of a linear equation $\frac{x}{2} - \frac{y}{3} = 1$ in two variable is ..... .

(A) $2x - 3y - 3 = 0$ (B) $3x - 2y - 6 = 0$

(C) $3x - 2y - 1 = 0$ (D) $2x - 3y - 6 = 0$

17. 5 years ago, the sum of ages of father and his son was 30 years. 3 years hence the sum of their ages would be ..... years.

(A) 46 (B) 40 (C) 50 (D) 38

18. In quadratic equation, if ..... then no real roots exist.

(A) $D > 0$ (B) $D = 0$ (C) $D = 1$ (D) $D < 0$

19. For quadratic equation $x^2 - 4x + a = 0$ has one of root is 2 then a = ...

(A) 2 (13) 4 (C) – 4 (D) 8

20. If the discriminate of $3x^2 - 4x + k = 0$ is 64, then k = ...

(A) – 4 (B) 4 (C) – 8 (D) 8

21. The quadratic equation ..... has equal roots.

(A) $x^2 - 12x - 36$ (B) $x^2 - 6x + 36$ (C) $x^2 - 12x + 36$ (D) $x^2 - 36$

22. The rate of 1 kg Pure Ghee is Rs. x. If Rs. 20 increases per kg then ..... kg Pure Ghee can be purchased in Rs. 800.

(A) $\frac{800}{x+20}$ (B) $\frac{800}{x-20}$ (C) $\frac{x+20}{800}$ (D) $\frac{800}{x}$

23. The common difference of Arithmetic progression – 2, –6, – 10, – 14, ... is ..... .

(A) – 8 (B) – 4 (C) – 2 (D) 4

24. (1) + (1 + 1) + (1 + 1 + 1) + ... + (1 + 1 + 1 ... (n – 1) times) =..... .

(A) $n(n + 1)$ (B) $\frac{n(n+1)}{2}$ (C) $\frac{n(n-1)}{2}$ (D) $n (n - 1)$

25. For the Arithmetic Progression $T_{30} - T_{25} = 25$, then d = ...

(A) 25 (B) 5 (C) 20 (D) 10

26. In Δ ABC, the sides $\overline{BC}$, $\overline{CA}$, $\overline{AB}$ are –in the proportion 3 : 4 : 5. The correspondence ABC $\leftrightarrow$ PQR is a similarity. If PR = 12, then perimeter of Δ PQR is ..... .

(A) 36 (13) 12 ; (C) 18 (D) 24

27. In Δ ABC and Δ MNO. The correspondence ABC $\leftrightarrow$ OMN is a similarity. If $m\angle A = 60$ then $m\angle M + m\angle N$ = ...

(A) 90 (B) 120 (C) 80 (D) 60

28. In Δ STU, $m\angle S + m\angle T = m\angle U$, if SU = 8, TU = 15 then ST = ...

(A) 13 (B) 15 (C) 17 (D) 23

29. The length of the diagonal of a square is $5\sqrt{2}$ then the measure of the side is .....

(A) $2,\sqrt{2}$ (B) 10 (C) $3\sqrt{2}$ (D) 5

30. In Δ ABC, AB = 10, BC = 6 and AC = 8, The length of a Median on the longest side of the triangle is ..... .

(A) 5 (B) 8 (C) 10 (D) 6

31. The perimeter of an equilateral triangle is 12. The length of the altitude of the triangle is ..... .

(A) $2\sqrt{3}$ (B) 4 (C) $3\sqrt{3}$ (D) 6

32. The distance of A(x, y) from origin is ..... .

(A) $x^2 + y^2$ (B) $\sqrt{x^2 + y^2}$ (C) $|x + y|$ (D) $|x - y|$

33. The co–ordinate of the midpoint of A(3, – 2) and B(1, – 4) is ..... .

(A) (2, – 1) (B) (– 2, 3) (C) (2, – 3) (D) (2, 3)

34. The perpendicular distance from (– 2, – 3) to y-axis is ..... .

(A) – 3 (B) – 2 (C) 3 (D) 2

35. ..... is the centroid of the triangle whose vertices are A(3, 4), B(4, 5),.C(2, 3).

(A) (4.5, 6) (B) (3, 4) (C) (4, 3) (D) (6, 9)

36. In Δ ABC, If $m\angle C = 90$ and $\tan A = \frac{1}{\sqrt{3}}$ then sin A = ...

(A) $\frac{1}{2}$ (B) $\frac{\sqrt{3}}{2}$ (C) $\frac{1}{\sqrt{2}}$ (D) 0

37. If 5 cosA = 4 sin A then tan A = ...

(A) $\frac{1}{4}$ (B) $\frac{5}{4}$ (C) 5 (D) 5

38. Which of the following is correct for some θ such that $(0 \leq 0 < 90)$?

(A) $\frac{1}{\cos\theta} < 1$ (B) $\sec\theta = 0$ (C) $\frac{1}{\sec\theta} = 1$ (D) $\frac{1}{\sec\theta} > 1$

39. $\frac{\text{cosec}^4\theta - \cot^4\theta}{\text{cosec}^2\theta + \cot^2\theta} =$ ..... .

(A) 1 (B) 2 (C) $\text{cosec}^2\theta + \cot^2\theta$ (D) 0

40. A 3 m long ladder leans on the wall such that its lower end remains 1.5 m away from the base of the wall. Then,the ladder makes an angle of measure ..... with the ground.

(A) 90 (B) 30 (C) 60 (D) 45

41. The tops of two poles of heights 18 m and 12 m are connected by a wire. If the wire makes an angle of measure 30 with horizontal, then the length of the wire is ..... .

(A) 8 m (B) 10 m (C) 18 m (D) 12 m

42. When the length of the shadow of the tree is equal to the height of the tree then the angle of elevation of the sun of light has measure ..... .

(A) 90 (B) 45 (C) 60 (D) 30

If m ∠OPB = 30 and OP = 15, then radius of the circle =..... .

(A) 15 (B) 30 (C) 7.5 (D) 5

44. In Δ ABC, AB = 6, BC = 8, AC = 10, then the radius of the circle touching all the three sides is ..... .

(A) 4 (B) 2 (C) 3 (D) 1

45. The area of a sector is given by ..... with radius r and length of an arc is 1 of a circle.

(A) $\frac{1}{2}$ r*l* (B) $\frac{4}{3}$ r*l* (C) $\frac{3}{2}$ r*l* (D) $\frac{1}{2}$ $r^2 l$

46. The union of an arc and its corresponding chord is called ..... .

(A) Area of sector (B) Segment (C) Sector (D) Semicircle

47. If the ratio of the area of two circles is 4 : 9, then the ratio of their circumference .....

(A) 9 : 4 (B) 2 : 3 (C) 4 : 9 (D) 16 : 81

48. Radius of a circle is 7 and its length of minor arc is 11 then the length of major arc is ..... .

(A) 44 (B) 22 (C) 33 (D) 11

49. The surface area of a cone with radius 3 cm and height 4 cm is ..... cm^2.

(A) 48 π (B) 12 π (C) 36 π (D) 15 π

50. The total surface area of a 5 Rupee coin is ..... .

(A) 2πrh (B) $\pi r^2 h$ (C) 2πr(r + h) (D) πr(r + h)

PART-B

Time : 2 Hours] *[Total Marks : 50*

Instructions : (1) There are **four** sections in this part of the question paper and total **1** to **17** questions are there.
(2) **All** the questions are **compulsory**. Internal options are given.
(3) Draw figures wherever required. Retain all the lines of construction.
(4) The numbers at right side represent the marks of the question.

SECTION–A

❖ **Show calculations in brief in the following question number 1 to 8. (Each carry 2 marks)** **16**

1. Find g.c.d. of 150 and 32 by Euclid's method.

2. If 3 is one of the root of $P(x) = 3x^3 - x^2 - ax - 45$ then find 'a'.

3. Solve the following pair of linear equation by method of substitution.
$2x + y = 8$, $x + 6y = 15$.

4. If $S_{10} = 50$, a = 0.5 then find d. **OR**

4. For any Arithmetic progression 200, 196, 192, ... - 200 is it possible that any term zero? Calculate your answer.

5. In Δ ABC, the bisector of ∠B intersect $\overline{AC}$ in D. If $\frac{AD}{DC} = \frac{5}{6}$ and AB = 8, Find BC.

6. Find the coordinates of the point which divides $\overline{AB}$ in the ratio 3:1 from A the coordinates of A and B are (2, 3) and (6, 7) respectively.

7. Prove that sin 48. sec 42 + cos 48. cosec 42 = 2 **OR**

Prove that $(\text{cosec}\theta - \cot\theta)^2 = \frac{1-\cos\theta}{1+\cos\theta}$

8. For the data set, Z – M = 2.5 if the mean is 20 then find the value of mode.

SECTION–B

❖ **Answer the question no. 9 to 12 as asked showing calculation.**
(Each carry 3 marks) 12

9. The sum of areas of two different squares is 400 meter^2, the difference of its perimeter is 16 meter find the length of sides of both the squares.

10. At a point on level ground, the angle of elevation of a vertical tower is found to be such that its tangent is $\frac{5}{12}$. On walking 192 metres towards the tower, the tangent of the angle is found to be $\frac{3}{4}$, find height of the tower.

11. A coin is tossed three times. Find the probability of the following events :
(1) A : getting at least two heads.
(2) B : getting exactly two heads.
(3) C : getting atmost one head.

12. The number of shares held by a person of various companies are as follows :
Find mean by step deviation method.

No. of shares	100-200	200-300	300-400	400-500	500-600	600-700
No. of companies	5	3	3	6	2	1

OR

12. Find mode of the following frequency distribution :

Class	4–8	8–12	12–16	16–20	20–24	24–28
Frequency	3	9	10	4	17	2

SECTION–C

❖ **Answer as asked from question 13 to 15 showing calculations.**
(Each carry 4 marks) 12

13. The tangents drawn to a circle from a point in the exterior of the circle are congruent.

14. The cost of ploughing a circular field at the rate Rs. 0.75 per m^2 is Rs. 4158. Find the cost of fencing the field at the rate of Rs. 30 per meter.

15. The curved surface area of a cone is 550 cm^2. If its diameter is 14 cm. Find its volume.

OR

15. A solid is composed of a cylinder with hemispherical ends on both the sides. The radius and the height of the cylinder are 20 and 35 cm. respectively. Find the total surface area of the solid.

SECTION–D

❖ **Find solutions of the question 16 and 17. (Each carry 5 marks)** 10

16. Draw ⊙(0, 4), construct a pair of tangents from A where OA = 10 units. Write steps of constructions.

17. If a line Paralle! to one of the sides of a triangle intersect the other two sides in a distinct points, then the segments of the other two sides in one half plane are proportional to the segments in the other half planes. **OR**

17. In Δ ABC, ∠A is right angle. Prove that BC^2 = AB^2 + AC^2.

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