1. If H.C.F. of (x, y) = 1, then H.C.F. of (x – y; x + y) = _____ .

(A) 1 or 2 (B) x or y (C) x + y or x – y (D) 4

2. In Euclid's division Lemma, for positive integers a and b the unique and r are obtained such that $a = bq + r$ is _____

(A) $0 < r < b$ (B) $0 \leq r \leq b$ (C) $0 < r \leq b$ (D) $0 \leq r < b$

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integers q

3. The cubic polynomial $p(a) = a^3 - a$ has _____ zeros.

(A) 0 (B) 1 (C) 2 (D) 3

4. If one root of equation $x^2 + ax - 8 = 0$ is 4, then a = _____ .

(A) 2 (B) 4 (C) –2 (D) –4

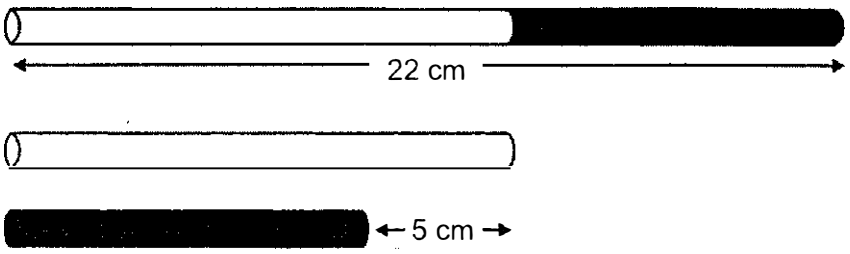
5. The product of zeros of cubic polynomial p(x) is _____

(A) $\frac{\text{Coefficient of } -x^2}{\text{Coefficient of } x^3}$ (B) $\frac{\text{Coefficient of } -x}{\text{Coefficient of } x^3}$

(C) $\frac{-\text{ The constant Term}}{\text{Coefficient of } x^2}$ (D) None of these

6. The diagram below shows two sticks – one BLACK and the other WHITE. Based on the measurements shown, what is the length of the white stick ?

(A) 5 cm (B) 8.5 cm (C) 13.5 cm (D) 17 cm



(Figure is not to scale)

7. x = _____ is identified as GOLDEN NUMBER.

(A) $\frac{1+\sqrt{5}}{2}$ (B) 0 (C) $\frac{1+\sqrt{2}}{2}$ (D) 1

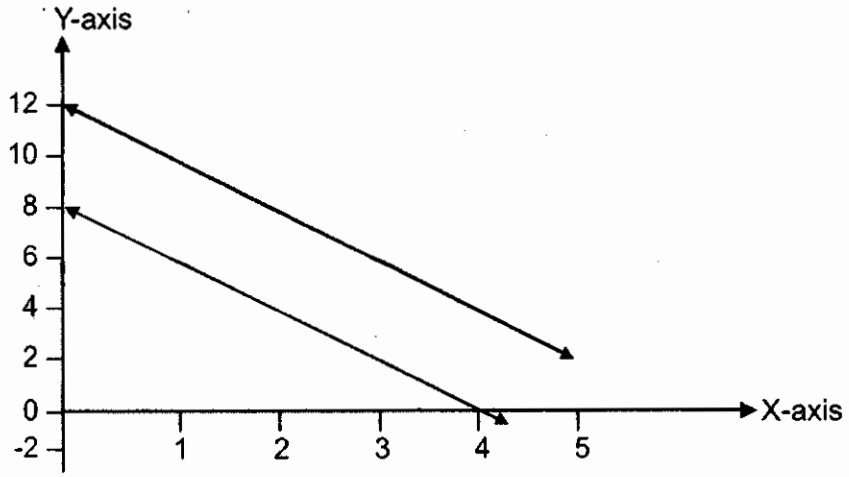
8. The Discriminant value of equation $5x^2 - 6x + 1 = 0$ is _____ .

(A) 16 (B) $\sqrt{56}$ (C) 4 (D) 56

9. If _____ is there, then the quadratic equation does not have real solution.

(A) D = 0 (B) D > 0 (C) D < 0 (D) D ≥ 0

10. Given below is a graph showing two lines.



Which of following statements is true about the solution(s) of the pair of equations represented by these lines ?

(A) They have a unique solution.

(B) They do not have any solution.

(C) They have infinite solutions.

(D) We cannot predict the number of solutions without knowing the algebraic form of these equations.

11. 2 years ago, the addition of ages of father–mother and their two daughters was 40 years. After 3 years the addition of their ages will be _____ .

(A) 40 (B) 46 (C) 50 (D) 60

12. In two digit number, the digit at tens places is 4 and the product of two numbers is 4 times greater than the tens place, then that number is _____ .

(A) 42 (B) 48 (C) 44 (D) 84

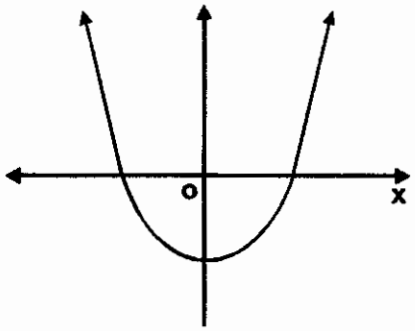
13. As per the given figure, y = p(x) graph has _____ real zeros.

(A) 0

(B) 1

(C) 2

(D) 3



14. If 2k + 1, 13, 5k – 3 are three consecutive terms of A.P., then k = _____.

(A) 17 (B) 13 (C) 4 (D) 9

15. If the sequence is 1, 1, 2, 3, 5, 8, 13, 21, 34, _____ .

(A) Arithmetic Progression. (B) Finite Sequence.

(C) Fibonacci Sequence. (D) None of the given three.

16. $S_n = 2n^2 + 3n$; then d = _____ .

(A) 13 (B) 4 (C) 9 (D) –2

17. In ΔABC, the bisector of $\angle A$ bisects $\overline{BC}$ at point D, then _____ .

(A) BD × AC = BC × AB (B) BD × AB = DC × AC

(C) AC × AB = DC × BC (D) BD × AC = DC × AB

18. In ΔABC, the measures of $\overline{BC}$, $\overline{CA}$ and $\overline{AB}$ are in 3:4:5 proportion. Correspondence ABC $\leftrightarrow$ PQR is congruence. If PR = 12, then perimeter of ΔPQR is _____ .

(A) 12 (B) 24 (C) 27 (D) 36

19. Out of following Pythagorean triplet, _____ is not a correct triplet.

(A) 7, 24, 25 (B) 20, 21, 29 (C) 11, 60, 61 (D) 13, 35, 37

20. In ΔABC, $\overline{AD}$ is a median, then as per Apollonius theorem, _____ is true.

(A) $AB^2 + AC^2 = 2(AD^2 + BC^2)$ (B) $AB^2 + AC^2 = 2(BD^2 = DC^2)$

(C) $AB^2 + AC^2 = 2(AD^2 + DC^2)$ (D) $AB^2 + AC^2 = 2(BD^2 + BC^2)$

21. In Mathematics Exam, the probability of Aayushi to score 100 out of 100 is _____ .

(A) 1 (B) 0 (C) $\frac{1}{100}$ (D) $\frac{1}{101}$

22. The probability in an event k is _____ .

(A) $0 \geq P(k) \geq 1$ (B) $0 \leq P(k) \leq 1$ (C) $0 > P(k) > 1$ (D) $0 < P(k) < 1$

23. If the dice is lifted once, then the probability of having divisible number on the dice is _____ .

(A) $\frac{1}{3}$ (B) $\frac{1}{6}$ (C) $\frac{1}{2}$ (D) 1

24. $\bar{x} - Z = 3$, $\bar{x} + Z = 45$, then M = _____ .

(A) 22 (B) 23 (C) 24 (D) 26

25. Rachna had an average score of 45 from 6 tests. Her teacher dropped her lowest score, which is 30 and calculated the average of the remaining scores to decide her grade. Which of these gives her new average score ?

(A) $\frac{(45 \times 5 - 30)}{5}$ (B) $\frac{(45 \times 5 - 30)}{6}$

(C) $\frac{(45 \times 6 - 30)}{5}$ (D) $\frac{(45 \times 6 - 30)}{6}$

26. In a Maths test taken by 35 students, the average score of 15 girls is 10 and that of 20 boys is also 10. Which of the following can be calculated based on the data we have ?

(A) The highest score in the class.

(B) The lowest score among the boys in the class.

(C) The sum of the scores of the 35 students of the whole class.

(D) All of the above can be calculated.

27. $\tan^2\theta = \sin^2\theta + \cos^2\theta$, then θ = _____ .

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

28. Which of the following pair is correct for trigonometric inter–relationship ?

(1) $\cos\theta$	(a) $\frac{\cos\theta}{\sin\theta}$
(2) $\tan\theta$	(b) $\frac{1}{\operatorname{cosec}\theta}$
(3) $\cot\theta$	(c) $\frac{1}{\sec\theta}$
(4) $\sin\theta$	(d) $\frac{1}{\cot\theta}$
	(e) $\sin\theta \cdot \cos\theta$

(A) 1–d, 2–e, 3–b, 4–a (B) 1–b, 2–a, 3–e, 4–d

(C) 1–c, 2–d, 3–a, 4–b (D) 1–e, 2–b, 3–c, 4–d

29. $\tan 7\theta \cdot \tan 3\theta = 1$; then value of θ = _____ .

(A) 0 (B) 9 (C) 10 (D) 18

30. When observed from top of tower, the angle of depression of two houses A and B in Eastern and Western direction is 30° and 60° respectively, then _____.

(A) House A is nearer to tower than House B.

(B) House B in nearer to tower than House A.

(C) House A and House B are equidistant from tower

(D) None of the given three.

31. On walking for search of a ball x meters on a hill making an angle of measure 30° with the ground, one can reach the height of 'y' meters from the ground, then _____ .

(A) $x = y$ (B) $x = 2y$ (C) $2x = \sqrt{3}y$ (D) $2x = y$

32. The length of minor arc $\overset{\frown}{AB}$ of Circle is $\frac{1}{4}$ of its circumference, then the angle subtended by the minor arc $\overset{\frown}{AB}$ will be _____ .

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

33. The length of minute hand of a Clock is 14 cm. If minute hand moves from 1 to 10 on the dial, then _____ cm^2 area will be covered.

(A) 462 (B) 154 (C) 308 (D) 616

34. If the radius of Circle is increased by 10%, then the corresponding area of new circle will be _____ . ($\pi = 3.14$)

(A) 121 πr^2 (B) 12.1 πr^2

(C) 1.21 πr^2 (D) None of the given three.

35. The maximum area of inscribed triangle in a semi–circle having radius 10 cm is _____ m^2.

(A) 10 (B) 50 (C) 100 (D) 200

36. If the area of a circle is 38.5 m^2, then its circumference will be _____ .

(A) 22 (B) 2.2 (C) 38.5 (D) 3.85

37. □ ABCD is a Rhombus. If it is inscribed in ⊙(O, r), then □ ABCD is __.

(A) Square (B) Rectangle (C) Trapezium (D) None of these

38. In ΔABC, $m\angle B = 90°$, AB = 4 and BC = 3, then the radius of circle touching all three sides of triangle will be _____ .

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

39. One Circle touches all sides of □ ABCD. If AB = 5, BC = 5, CD = 6; then AD = _____ .

(A) 3 (B) 7 (C) 4 (D) 9

40. Point P is on the outer side of Circle ⊙(O, 15). The tangent drawn from point P touches the circle at T. If PT = 8; then OP = _____ .

(A) 7 (B) 13 (C) 17 (D) 23

41. The cubic (cubical) volume of Hemisphere having 1 cm diameter will be _____ cm^3.

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{12}$ (C) $\frac{2\pi}{3}$ (D) $\frac{4\pi}{3}$

42. If the frustum of a Cone is having 6 cm height and radius 5 cm and 9 cm respectively; then its cubical volume will be _____ cm^3.

(A) 320 π (B) 151 π (C) 302 π (D) 98 π

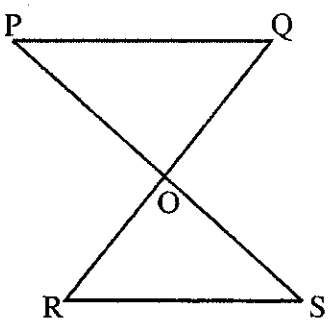
43. **The** formula for finding the total surface area of a Cylinder having cone shaped lid at both the ends, will be _____ .

(A) $\pi r(l + 2r)$ (B) $\pi r(2h + r)$ (C) $2\pi r(h + l)$ (D) $2\pi r(h + 2r)$

44. 1 $meter^3$ = _____ cm^3.

(A) 1 (B) 10^2 (C) 10^3 (D) 10^6

45. The two triangles in the figure are congruent using congruence theorem. Here, it is given OQ = OR. Which of these conditions alongwith the given condition is sufficient to prove that the two triangles are congruent to each other ?



(A) $\angle P = \angle S$ (B) $\angle Q = \angle R$

(C) OP = OS (D) PQ = SR

46. In ΔPQR, $\frac{PQ}{1} = \frac{PR}{2} = \frac{QR}{\sqrt{3}}$, then $m\angle R$ = _____ .

(A) 90° (B) 60° (C) 45° (D) 30°

47. From P(–3, 2) the feet of perpendicular drawn on Y–axis is M. Then the co-ordinate of M is _____ .

(A) (3, 0) (B) (0, 2) (C) $\left(\frac{3}{2}, -1\right)$ (D) (–3, 2)

48. The difference of P(a, b) from point of origin is _____ .

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

49. Which of the following group is true for $\square$ ABCD ?

(1) $\square$ ABCD is Rhombus	(a) $\overline{AC}$ and $\overline{BD}$ bisects
(2) $\square$ ABCD is Parallelogram	(b) $\overline{AC}$ and $\overline{BD}$ bisects at right angle
(3) $\square$ ABCD is Rectangle.	(c) $\overline{AC}$ and $\overline{BD}$ are congruent and bisects at right angle
(4) $\square$ ABCD is Square	(d) $\overline{AC}$ and $\overline{BD}$ are congruent and bisects.

(A) 1–d, 2–a, 3–d, 4–c (B) 1–c, 2–d, 3–a, 4–b

(C) 1–b, 2–a, 3–d, 4–c (D) 1–b, 2–c, 3–d, 4–a

50. When point $A(x_1, y_1)$ and point $B(x_2, y_2)$ joined to form $\overline{AB}$ and dividing $\overline{AB}$ in the proportion of λ:1; the co-ordinate of points will be _____ .

(A) $\left(\frac{\lambda x_2 + x_1}{\lambda + 1}, \frac{\lambda y_2 + y_1}{\lambda + 1}\right)$ (B) $\left(\frac{\lambda x_2 + x_1}{\lambda - 1}, \frac{\lambda y_2 + y_1}{\lambda - 1}\right)$

(C) $\left(\frac{\lambda x_1 + x_2}{\lambda + 1}, \frac{\lambda y_1 + y_2}{\lambda + 1}\right)$ (D) $\left(\frac{\lambda x_2 + x_1}{\lambda - 1}, \frac{\lambda y_2 + y_1}{\lambda - 1}\right)$

PART-B

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

Instructions : As per Question Paper-1

SECTION-A

❖ **Answer the following questions by doing the calculations in brief. (Each question carries 2 marks).** **16**

1. Find the square root : $14 + 6\sqrt{5}$.

2. Find the Quadratic equation, whose addition of zeros is $-\frac{7}{3}$ and multiplication is $\frac{4}{3}$.

3. In an Arithmetic Progression $T_7 = 18$ and $T_{18} = 7$, obtain T_{25}.

OR

3. Addition of which term of Arithmetic Progression 2, 7, 12, 17, ... will be 990?

4. In ΔPQR, $m\angle Q = 90$ and $\overline{QM}$ is an altitude; $M \in \overline{PR}$. If QM = 12, PR = 26; then find PM and RM. If PM < RM; then find PQ and QR.

5. Two concentric circles having radii 73 and 55 are given. The chord of circle having greater (larger) radius touches the small circle. Then find the length of this chord.

6. Find the area of triangle ΔABC having vertices A(4, 2), B(3, 9) and C(10, 10).

OR

Find the co-ordinates of points which divide the line segment joining A(–7, 5) and B(5, –1) into three congruent segments
(Such points are called the points of trisection of segment).

7. In a Hostel, one day reading hours of 20 students was observed, whose result is mentioned in the table below. From the table, find the Mode.

No. of Reading Hours	1-3	3-5	5-7	7-9	9-1
Student's strength in Hostel	7	2	8	2	1

8. A card is selected at random from well-shuffled pack of 52 cards. Find the probability that the selected card is _____ .

(1) black coloured queen.

(2) not a king.

SECTION-B

❖ **Answer the following questions from No. 9 to 12 with calculations. (Each question is of 3 marks).** **12**

9. Prove $(\sin\theta + \operatorname{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot\theta$.

OR

9. Find the value of $\frac{\text{cosec } 38}{\sec 52} + \frac{2}{\sqrt{3}} \tan 38 \cdot \tan 60 \cdot \tan 52 - 3 (\sin^2 32 + \sin^2 58)$

10. The chord of Circle of 84 cm diameter subtends an angle of 60° at the centre of a Circle. Find the area of minor segment corresponding to the chord. (Take $\sqrt{3} = 1.73$)

11. Find the solution of pair of equation

$$\frac{5}{2x} + \frac{2}{3y} = 7 \; ; \; \frac{3}{x} + \frac{2}{y} = 12 \; (x \neq 0; \; y \neq 0)$$

12. Find the median of the following Frequency Distribution.

Class	4-8	8-12	12-16	16-20	20-24	24-28
Frequency	9	16	12	7	15	1

SECTION-C

❖ **Answer the following questions from No.' 13 to 15, as directed calculations. (Each question is of 4 marks).** **12**

13. On Hemisphere, frustum of a Cone shaped shuttle-cock is used for playing Badminton. The outer radius of frustum of cone is 5 cm and inner radius is 2 cm. The height of entire shuttle-cock is 7 cm. Then find the outer surface area of shuttle-cock.

14. A jet plane is at a vertical height of h. The angles of depression of two tanks on the horizontal ground are have measures α and β ($\alpha > \beta$). Prove that the distance between the tanks is $\frac{h(\tan\alpha - \tan\beta)}{\tan\alpha - \tan\beta}$.

15. The petrol rate is increased by Rs. 5/- per litre. Now in Rs. 1320/-, 2 litres less petrol is obtained as compared to previous rate. Find the increase in rate of petrol per litre.

OR

15. Kailash's age at present is 2 years less than 6 times the age of his daughter Prerna. The product of their ages 5 years later will be 330. What was the age of Kailash when his daughter Prerna was born?

SECTION-D

❖ **Answer the following questions from No. 16 to 17. (Each question carries 5 marks).**

16. Draw $\overline{PQ}$, where PQ = 10 cm. Draw circle ⊙(P, 4) and ⊙(Q, 3). Draw tangent to each circle from centre of other circle. Write points of construction.

OR

16. Draw ΔABC, where m∠ABC = 90; BC = 4 cm and AC = 5 cm and then construct ΔBXY with $\frac{4}{3}$ scale factor. Write points of construction.

17. Write converse of Pythagoras Theorem and prove it.

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