1. $(3x + 1)^2$ is divisible by 3 then remainder is _____.

(a) 2 (b) 0 (c) –1 OR 1 (d) 1

2. l.c.m. (144, 610) = _____.

(a) 144 (b) 610 (c) 1 (d) 43920

3. The product of zeros of polynomial $x^2 - 4x + 3 = 0$ is _____.

(a) 1 (b) 3 (c) 4 (d) –4

4. One factor of $x^3 + 6x^2 + 11x + k$ is $x + 3$ then k = _____.

(a) 3 (b) 6 (c) 2 (d) 4

5. $5x^2 + 6x + 3$ is divisible by $x + 3$ then remainder will be _____.

(a) 0 (b) –30 (c) 30 (d) 1

6. If $2x + 3y = 7$ and $3x + 2y = 3$ then $x - y$ = _____.

(a) 4 (b) –4 (c) 2 (d) –2

7. (2012, –2011) lies in _____ quadrant.

(a) First (b) Second (c) Third (d) Fourth

8. Y Years ageo, the age of Bhagvati is X year, then after Z year the age of Bhagvati is _____.

(a) x – y + z (b) x + y + z (c) y – x + z (d) x – y – z

9. $\frac{5}{x}+\frac{7}{y} = 17, \frac{7}{x}+\frac{5}{y} = 19$ then $\frac{2}{x}+\frac{2}{y}$ = _____.

(a) 3 (b) 5 (c) 6 (d) 8

10. One root of $x^2 - 4x + a = 0$ is 2 then a = _____.

(a) –2 (b) 2 (c) –4 (d) 4

11. The discriminant of $a^2x^2 + b^2x + c^2 = 0$ is _____.

(a) $D = b^2 - 4ac$ (b) $D^2 = b^2 - 4ac$ (c) $D = b^4 - 4a^2c^2$ (d) $D = b^4 + 4a^2c^2$

12. The roots of $ax^2 + bx + c = 0$ are equal then real root is _____.

(a) $-\frac{b}{2a}$ (b) $\frac{-2a}{b}$ (c) $\frac{b}{2a}$ (d) $\frac{2a}{b}$

13. The discreminant of the equation $\sqrt{5}x^2 - 2\sqrt{2}x - 2\sqrt{5} = 0$ is _____.

(a) $4\sqrt{3}$ (b) 48 (c) $2\sqrt{3}$ (d) 32

14. The difference between two roots of equation $ax^2 + bx + c = 0$ is _____.

(a) $-\frac{D}{a}$ (b) $\frac{\sqrt{D}}{a}$ (c) $\frac{D}{a}$ (d) $-\sqrt{\frac{D}{a}}$

15. The roots of quadratic equation $x^2 + 18x = 0$ are _____.

(a) inverse (b) opposite (c) fraction (d) equal

16. One root of $x^2 + 6x + k = 0$ is 4 then k = _____.

(a) 20 (b) 40 (c) –40 (d) 8

17. Roots of $x^2 + 5x + 6 = 0$ are α, β then $\alpha^2 + \beta^2 =$ _____.

(a) 37 (b) 13 (c) 25 (d) None

18. For A.P. $S_n - 2S_{n-1} + S_{n-2} =$ _____. $(n > 2)$

(a) 2d (b) d (c) a (d) a + d

19. $9 + 19 + 29 + \ldots + 99 =$ _____.

(a) 460 (b) 450 (c) 540 (d) 455

20. In A.P. $T_7 = 12$, $T_{11} = 28$ then common difference d is _____.

(a) 16 (b) 4 (c) 5 (d) 3

21. In ΔABC, B–M–C and A–N–C, $\overline{MN} \parallel \overline{AB}$. If NC:NA = 1:3 and CM = 4 then BC = _____.

(a) 12 (b) 16 (c) 8 (d) $\frac{1}{2}$

22. For ΔXYZ, ΔMNO $\frac{XY}{MN} = \frac{YZ}{NO} = \frac{XZ}{MO}$ then correspondence XYZ $\leftrightarrow$ _____ is similarity.

(a) NMO (b) MON (c) NOM (d) MNO

23. For $\Delta ABC \sim \Delta RQP$ $m\angle P : m\angle Q : m\angle R = 1:3:5$ then $m\angle A : m\angle B : m\angle C =$ _____.

(a) 1:3:5 (b) 5:3:1 (c) 3:5:1 (d) None

24. In ΔABC, $AB^2 + AC^2 = 50$ and length of Median AD = 3 then BC = _____.

(a) 4 (b) 24 (c) 8 (d) 16

25. In ΔABC, $m\angle B = 90$ and $\overline{BM}$ is an altitude on hpotenuse $\overline{AC}$. If AM = 4.5 and MC = 8 then BM = _____.

(a) 4 (b) 6 (c) 8 (d) 10

26. G is the centroid of ΔPQR. If GM = 5 then QM = _____ where $\overline{QM}$ is a median.

(a) 9 (b) 15 (c) 12 (d) 18

27. Distance between $A(x_1, y_1)$, $B(x_2, y_2)$ is _____.

(a) $\sqrt{(x_1 + x_2)^2 + (y_1 + y_2)^2}$ (b) $\sqrt{(x_1 + x_2)^2 - (y_1 + y_2)^2}$

(c) $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ (d) $\sqrt{(x_1 - y_1)^2 + (x_2 - y_2)^2}$

28. If P(1, 2), Q(3, 4), R(2, 1) then circumcentre of ΔPQR is _____.

(a) $\left(\frac{3}{2}, \frac{3}{2}\right)$ (b) (3, 4) (c) $\left(\frac{5}{2}, \frac{5}{2}\right)$ (d) (2, 4)

29. The y coordinate is twice the x–coordinate of the midpoint of line segment joining by A(m, 5) and B(2, 7) then m = _____.

(a) 3 (b) 4 (c) 5 (d) 6

30. Find the coordinates of point which divides the line segment joining $A(x_1, y_1)$, and $B(x_2, y_2)$ in the ratio m:n from A.

(a) $\left(\frac{mx_2 - nx_1}{m - n}, \frac{my_2 - ny_1}{m - y}\right)$ (b) $\left(\frac{mx_2 + my_2}{m + n}, \frac{my_1 + ny_1}{m + n}\right)$

(c) $\left(\frac{mx_2 + nx_1}{m + n}, \frac{my_2 + ny_1}{m + n}\right)$ (d) $\left(\frac{mx_2 + nx_1}{m - n}, \frac{my_2 + ny_1}{m - n}\right)$

31. If $\tan\theta = \frac{4}{3}$ then $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$ = _____.

(a) $\frac{1}{3}$ (b) 3 (c) $\frac{3}{4}$ (d) $\frac{9}{16}$

32. $\frac{1}{\cos^2\theta} - \frac{\sin^2\theta}{\cos^2\theta}$ = ...

(a) 0 (b) 2 (c) 1 (d) None

33. $\text{cosec}48° = \sec\theta$ then θ = _____.

(a) 42° (b) 48° (c) 38° (d) 28°

34. If $\sin\theta = \frac{3}{5}$ than value of $\tan\theta + \text{cosec}\theta$ = _____.

(a) $\frac{4}{3}$ (b) $\frac{29}{12}$ (c) $\frac{3}{5}$ (d) $\frac{5}{3}$

35. If the angles of elevation of a tower from two points distance a and b (a > b). From its foot on the same side of the tower have measure 30 and 60, then the height of the tower is _____.

(a) $\sqrt{a+b}$ (b) $\sqrt{ab}$ (c) $\sqrt{a-b}$ (d) $\sqrt{\frac{a}{b}}$

36. The angle of elevation of the base of the temple from the top of building has measure 60 and the angle of elevation of the base of the building from the top of temple is 60 then _____.

(a) Temple if taller than building (b) Building is taller than temple

(c) Temple and building are equally tall

(d) Cannot be determined

37. The height of building is h and the length of its shadow is x. If the angle of elevation of the sun has measure is 45° then _____.

(a) x = h (b) x = 2h (c) 2x = h (d) $h = \sqrt{3}x$

38. How many circle passes through three non collinear point ?

(a) one (b) two (c) three (d) four

39. In ⊙(P, 17), the lengthof two parallel chords is 16 and **30.** If these two chords one side of centre then the distance between two chord is _____.

(a) 5 (b) 7 (c) 9 (d) 12

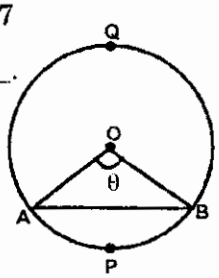
40. $\overline{OA}$ and $\overline{OB}$ are the two mutually perpendicular radii of a circle having radius 9 cm. The area of the minor sector corresponding to $\angle AOB$ is _____. ($\pi = 3.14$)

(a) 63.575 (b) 63.585 (c) 63.595 (d) 63.60

41. $\overline{OA}$ and $\overline{OB}$ are the two mutually perpendicular radii of a circle having radius 7 then length of minor arc is _____.

(a) 11 (b) 22 (c) 7 (d) None of these

42. From the figure, major segment is _____.



(a) $\overline{AB} \cup \overset{\frown}{APB}$ (b) $\overline{AB} \cup \overset{\frown}{AQB}$

(c) $\overset{\frown}{APB} \cup \overline{OA} \cup \overline{OB}$ (d) $\overset{\frown}{AQB} \cup \overline{OA} \cup \overline{OB}$

43. The length of minute hand of a clock is 10 cm. Find the area of the sector. Formed by the present position and the position after five minute of the minute hand. (π = 3.14)

(a) 157 (b) $\frac{157}{6}$ (c) $27\frac{1}{6}$ (d) None of these

44. If volume of sphere $\frac{4}{3}\pi$ cm^3 then its diameter is _____.

(a) 0.5 (b) 1 (c) 2 (d) 2.5

45. 1 litre = _____ cm^3.

(a) 1000 (b) 10,000 (c) 100 (d) 10

46. The surface area of cylinder is 132 sq.m. and radius is 7 m then height of cylinder is _____.

(a) 3 (b) 4 (c) 5 (d) 6

47. The surface area and radius of sphere and cone is equal, then the slant height of cone is _____ times its radius.

(a) half (b) twice (c) thrice (d) fourth times

48. If $\bar{x} - z = 3$ and $\bar{x} + z = 45$ then M = _____. **[March 2013]**

(a) 24 (b) 22 (c) 26 (d) 23

49. The mean for data is $\bar{x}$. If in every observation multiply by m and n added to each observation then new mean _____.

(a) $mn + \bar{x}$ (b) $n\bar{x} + m$ (c) $n\bar{x} - m$ (d) $m\bar{x} + n$

50. For ungrouped data, $\sum_{i=1}^{15} x_i - 6\bar{x} = 36$ then $\bar{x}$ = _____.

(a) 2 (b) 3 (c) 4 (d) 5

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PART-B

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

Instructions : As per Question Paper-1

SECTION-A

❖ **Answer the following questions in short answer questions : (2 marks each)** **16**

1. Find square root : $2 + \sqrt{3}$.
2. –4 and 9 are the sum and product of the zeros respectivelyof a quadratic polynomial. Find the quadratic polynomial.
3. Solve by cross multiplication method :

   $0.3x + 0.4y = 2.5$, $0.5x - 0.3y = 0.3$
4. Find the 10th term from end for A.P. 3, 6, 9, ... 300. **OR**
4. In A.P. $T_7 = 18$, $T_{18} = 7$ then Find T_{101}.
5. In Rhombus XYZW. XY = 14 and YW = 48. Find XY.
6. Find the ratio in which X–axis devides the segment joining A(3, –2) and B(–6, 4) from B.
7. If in ΔABC, $m\angle B = 90$, AB = 3, AC = 6 then. Find $m\angle C$, $m\angle A$, BC. **OR**
7. If $3\cot A = 4$ then verify $\frac{1-\tan^2 A}{1+\tan^2 A} = \cos^2 A - \sin^2 A$.

8. The distribution below shows the number of wickets taken by a bowlder in one day cricket matches. Find the mean number of wickets.

Number of wickets	20–60	60–100	100–150	150–250	250–350	350–450
Number of bowlers	7	5	16	12	2	3

SECTION-B

❖ **Solve the following : (3 marks each)** 12

9. While selling a pen for Rs. 24 the loss in percentage is equal to its cost price. Find the cost price of pen. The cost price of pen is less than Rs. 50.

10. A dice is thrown once. Find the probability of getting (i) a prime number (ii) a number lying between 2 and 5 and (iii) an even number.

11. Find the mode of the following frequency distribution.

Class	0–15	15–30	30–45	45–60	60–75	75–90	90–105
Frequency	8	16	23	57	33	23	13

OR

11. The median of 230 observation of the following frequency distribution is 46. Find a and b.

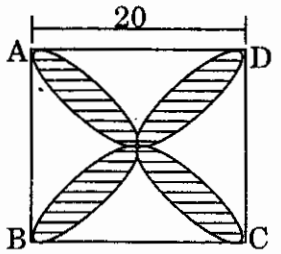
Class	10–20	20–30	30–40	40–50	50–60	60–70	70–80
Frequency	12	30	a	65	b	25	18

12. A bridge across a valley is h metres long. There is a temple in the valley directly below the bridge. The anlge of depression of the top of the temple from the two ends of the bridge have measures α and β. Prove that the height of the bridge above the top of the temple is $\frac{h \cdot (\tan\alpha \cdot \tan\beta)}{\tan\alpha + \tan\beta}$.

SECTION-C

❖ **Solve the following : (4 marks each)** 12

13. ABCD is a square of side 20 cm. Find the area of blue coloured region formed by the semi circles drawn on each side as shown in figure.



14. A metallic sphere of radius 3.6 cm is melted and a wire of diameter 0.4 cm of uniform cross–section is drawn from it. Find the length of the wire. **OR**

14. How many spherical balls of diameter 0.5 cm. can be cast by melting a metal cone with radius 6 cm and height 14 cm.

15. P is the point in the exterior of ⊙(O, r) and the tangents from P to the circle touch the circle at X, Y (i) if r = 12, XP = 5 then find OP (ii) m∠XOY = 110 then find m∠XPO.

SECTION-D

❖ **Solve the following : (5 marks each)** 10

16. Draw $\overline{PQ}$ of length 6.5 cm and divide it in the ratio 4:7 write the steps of construction.

17. Prove that in ΔABC, $BC^2 = AB^2 + AC^2$ then $\angle A$ is a right angle. **OR**

17. In the plane of ΔPQR, a line $l \parallel \overline{QR}$ and l intersects $\overline{PQ}$ and $\overline{PR}$ at points A and B then prove that $\frac{PA}{AQ} = \frac{PB}{BR}$.

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