Sun Tuition Center - 9629216361

CLASS : X SUBJECT : MATHEMATICS MARKS : 100 TIME : 3 HRS

TEST NO : 2

PART – A

CHOOSE THE CORRECT ANSWER 14 X 1 = 14

1. If $f(x) = x^2 - x$ then $f(x+1) - f(x-1)$ is (a) 0 (b) $4x$ (c) $4x + 2$ (d) $4x - 2$

2. In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120? (a) 8 (b) 9 (c) 7 (d) 6

3. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are (a) 1, 3, 5 (b) 1, 4, 8 (c) 0, 1, 3 (d) 0, 1, 8

4. If $(x - 6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is

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

5. The value of x in $(x + 2) + 2(x - 1) = 4x - 3$

(a) 2 (b) 3 (c) -2 (d) -3

6. If A is a 2 X 3 matrix and B is a 3 X 4 matrix, how many columns does AB have

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

7. In ΔLMN, $\angle L = 60°$, $\angle M = 50°$. If $\Delta LMN \sim \Delta PQR$ then the value of $\angle R$ is

(a) 30° (b) 40° (C) 70° (d) 110°

8. In a ΔABC, AD is the bisector of $\angle BAC$. If AB = 8 cm, BD = 6 cm and DC = 3 cm.

The length ofthe side AC is (a) 3 cm (b) 4 cm (c) 6 cm (d) 8 cm

9. The equation of a line passing through the origin and perpendicular to the line $7x - 3y + 4 = 0$ is

(a) $7x - 3y + 4 = 0$ (b) $3x - 7y + 4 = 0$ (c) $7x - 3y = 0$ (d) $3x + 7y = 0$

10. The point of intersection of 3x - = 4 and x + y = 8 is

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

11. $(\cos^2\theta - 1)(\cot^2\theta + 1) + 1 =$

(a) 1 (b) -1 (c) 2 (d) 0

12. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units.

Then $r_1 : r_2$ is (a) 1 : 4 (b) 4 : 1 (c) 1 : 2 (d) 2 : 1

13. The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is

(a) $68\pi\ cm^2$ (b) $60\pi\ cm^2$ (c) $136\pi\ cm^2$ (d) $120\pi\ cm^2$

14. If the standard deviation of x, y, z is p then the standard deviation of $3x + 5$, $3y + 5$, $3z + 5$ is (a) $3p$ (b) $3p + 5$ (c) $9p + 15$ (d) $p + 5$

PART - B

ANSWER ANY 10 QUESTIONS (QUESTION NUMBER 28 IS COMPULSORY) 10 X 2 = 20

15. Let A = {1,2,3} and B = { x | x is a prime number less than 10}. Find A×B and B × A .

16. Find all positive integers, when divided by 3 leaves remainder 2.

17. Solve 2x − 3y = 6 , x + y = 1

18. Show that the roots of the equation $x^2 + 2(a + b)x + 2(a^2 + b^2) = 0$ are unreal.

19. If A = $\begin{pmatrix} cos\theta & sin\theta \\ -sin\theta & cos\theta \end{pmatrix}$ prove that $AA^T = I$

20. If ABC~DEF such that area of ABC is $9cm^2$ and area of DEF is $16cm^2$ and BC=2.1cm.

Find the length of EF.

21. Show that the points (-2, 5) , (6,-1) and (2,2) are collinear.

22. Find the equation of the straight line parallel to the line $3x - y + 7 = 0$ and passing through the point (1, -2).

23. A girl of height 150 cm stands in front of a lamp-post and casts a shadow of length $150\sqrt{3}$ cm on the ground. Find the angle of elevation of the top of the lamp-post .

24. Find the diameter of a sphere whose surface area is 154 m^2.

25. Find the volume of a cylinder whose height is 2 m and whose base area is 250 m^2.

26. The range of a set of data is 13.67 and the largest value is 70.08.

Find the smallest value.

27. The mean of a data is 25.6 and its coefficient of variation is 18.75.

Find the standard deviation.

28. Find the sum of the first 20 terms of the geometric series $\frac{5}{2} + \frac{5}{6} + \frac{5}{18} + \cdots$.

PART - C

ANSWER ANY 10 QUESTIONS (QUESTION NUMBER 42 IS COMPULSORY) 10 X 5 = 50

29. Verify that the composition of functions is associative, given

f(x) = x^2 g(x) = 3x + 5 h(x) = x – 1

30. The sum of three consecutive terms that are in A.P. is 27 and their product is 288.

Find the threeterms.

31. Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm,..., 24 cm. How much area can bedecorated with these colour papers?

32.Find the square root of $64x^4-16x^3+17x^2 - 2x + 1$

33. If $\alpha$and $\beta$are the roots of the equation x^2-3x - 1 =0, form a quadratic equation whose roots $\frac{1}{\alpha^2}$ are $and\ \frac{1}{\beta^2}$.

34. If A = $\begin{pmatrix} 1 & 1 \\ -1 & 3 \end{pmatrix} B = \begin{pmatrix} 1 & 2 \\ -4 & 2 \end{pmatrix} and C = \begin{pmatrix} -7 & 6 \\ 3 & 2 \end{pmatrix} verify\ that$ A(B+C) =AB+AC.

35. The perpendicular PS on the base QR of a ΔPQR intersects QR at S, such that QS=3 SR.

Prove that $2PQ^2 = 2PR^2 + QR^2$

36. If the point A(-3,9), B(a,b) and C(4,-5) are collinear and if a+b=1,then find a and b.

37. Find the equation of a straight line through the intersection of lines 5x – 6y = 2, 3x + 2y = 10and perpendicular to the line 4x – 7y + 13 = 0

38. From the top of a tower of height 60 m, the angles of depression of the top and the bottom of a building are observed to be 30° and 60°respectively. Find the height of the building.

39. The volume of a solid hemisphere is 29106 cm^3. Another hemisphere whose volume is two-third of the above is carved out. Find the radius of the new hemisphere.

40. Find the coefficient of variation of 24, 26, 33, 37, 29, 31.

41. Three unbiased coins are tossed once. Find the probability of getting at most 2 tails or at least 2heads.

42. A right circular conical vessel whose internal radius is 5 cm and height is 24 cm is full of water. The water is emptied into an empty cylindrical vessel with internal radius 10 cm. Find the height of the water level in the cylindrical vessel.

PART - D

ANSWER THE FOLLOWING QUETIONS **2 X 8 = 16**

43. (a) Draw a circle of radius 4.5 cm. Take a point on the circle. Draw the tangent at that point using alternate segment theorem. (OR)

(b) Draw a triangle ABC of base BC = 8 cm, the bisector of ĐA ∠A = 60 and meets BC at D such that BD = 6 cm.

44. (a) Draw the graph of $y = 2x^2 - 3x - 5$ and hence solve this of $y = 2x^2 - 4x - 6 = 0$

(OR)

(b) Draw the graph of xy = 24, x,y >0. Using the graph find, (i) y when x = 3 and (ii) x when y = 6.

****** All the best *****