UNIT TEST-5

X-STD

TIME: 3.00 HOURS   **MATHEMATICS**   **MARKS: 100**

ALPHA MATHS ACADAMY

JEE, CBSE AND BOARD EXAMINATION COACHING CENTER

TENKASI

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Instructions: **1)** *Check the question paper for fairness of printing. If there is any lack of fairness,*

inform the Hall Supervisor immediately.

2) *Use Blue or Black ink to write and underline and pencil to draw diagrams.*

PART-A $14 \times 1 = 14$

Note: **i)** *Answer all the questions.*

ii) *Choose the most appropriate answer from the given four alternatives and write the option*

code and the corresponding answer.

1. The area of triangle formed by the points $(-5,0), (0,-5)$ *and* $(5,0)$ *is*

   (a) 5 sq. units (b) 0 sq. units (c) 25 sq. units (d) none of these

2. If $(5,7)$ $(3,p)$ *and* $(6,6)$ are collineas then the value of p is

   $(a)9$ $(b)6$ $(c)3$ (d) 12

3. $(2,11)$ is the point of intersection of two lines

   $(a)x + y = 3; \ 3x + y = 7$ $(b)x + 3y - 3 = 0; \ x - y - 7 = 0$

   $(c)x - y - 3 = 0; \ 3x - y - 7 = 0$ $(d)3x + y = 3; \ x + y = 7$

4. The slope of the line joining $(12,3), (4,1)$ *is* $\frac{1}{8}$ the value of 'a' is

   (a) 1 (b) 2 (c) 4 $(d) - 5$

5. The slope of the line which is parallel to a line joining the points $(0,0)$ and $(-8,8)$ is

   $(a) - 1$ (b) 1 (c) $\frac{1}{3}$ $(d) - 8$

6. The straight line given by the equation $y = 10$

   (a) parallel to y axis (b) parallel to x axis

   (c) passing through the origin (d) passing through the point $(0,10)$

7. When proving that a quadrilateral is a parallel by using slopes you must find

   (a) the slopes of two sides (b) the slopes of two pair of opposite side

   (c) the length of all the sides (d) none of these

8. A straight line has equation $4y = 4x + 20$ then the slope and y interest is

    (a) (5,11) (b) (1,5) (c) (−5,1) (d) (1, −5)

9. If slope of the line PQ is $\frac{1}{\sqrt{3}}$ then the slope of the perpendicular bisector PQ is

    (a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) 0 (d) $-\sqrt{3}$

10. The equation of a line passing through the origin and perpendicular to the line $7x - 3y + 5 = 0$ is

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

11. The point of intersection of $x + y = 4$ and $x - y = 4$ is

    (a) (0,4) (b) (4,0) (c) (−4,0) (d) (0, −4)

12. The inclination of x axis and a very line parallel to x axis is

    $(a) 90°$ $(b) 45°$ (c) 0° (d) none of these

13. The measure of steepness is called

    (a) parallel line (b) perpendicular line (c) slope or gradient (d) none of these

14. The slope of a vertical line is

    (a) defined (b) undefined (c) $x = 0$ (d) $y = 0$

PART-B $10 \times 2 = 20$

Note: **i)** *Answer any TEN questions.*

    ii) *Question No.28 is compulsory.*

15.   Show that the points $P(-1.5,3), Q(6, -2), R(-3,4)$ are collinear.

16.   The floor of a hall is covered with identical tiles which are in the shapes of triangles. One such triangle has the vertices $(-3,2), (-1, -1)$ and $(1,2)$. If the floor of the hall is completely covered by 110 tiles, find the area of the floor.

17.   Find the area of triangle formed by the points $(-10, -4)(-8, -1)$ and $(-3, -5)$.

18.   If the three points $(3, -1)(a, 3)$ and $(1, -3)$ are collinear. Find the value of 'a'.

19.   Find the slope and y intercept of $\sqrt{3}x + (1 - \sqrt{3})y = 3$

20.   Find the equation of a straight line which has slope $\frac{-5}{4}$ and passing through the point $(-1,2)$.

21. Show that the straight line $x - 2y + 3 = 0$ and $6x + 3y + 8 = 0$ are perpendicular.

22. Without using Pythagoras theorem, show that the points $(1, -4)(2, -3)$ and $(4, -7)$ form right angle triangle.

23. If the area of a triangle formed by the vertices $A(-1,2), B(k, -2), C(7,4)$ (taken in order) is 22 $sq. units.$ Find the value of k.

24. The line p passes through the points $(3, -2)(12,4)$ and the line q passes through the Points $(6, -2)$ and $(12,2)$. Is p parallel to q?

25. Find the slope of a line joining the points $(5, \sqrt{5})$ with the origin.

26. Find the equation of a straight line passing through the midpoint of a line segment joining the points $(1, -5)(4,2)$ parallel to x-axis.

27. The equation of a straight line is $2(x - y) + 5 = 0$. Find its slope, inclination and intercept on the y-axis.

28. Find the value of a , if the line through $(-2,3)$ and $(8,5)$ is perpendicular to $y = ax + 2$.

PART-C $10 \times 5 = 50$

Note: **i)** **Answer any TEN questions.**

   ii) **Question No.42 is compulsory.**

29. Find the equation of the median of $\triangle ABC$ through vertex A where the vertices are $A(6,2),$ $B(-5, -1)$ and $C(1,9)$.

30. The line joining the points $A(0,5)$ and $B(4,1)$ is a tangent to a circle whose centre O is at the point $(4,4)$

   (i) Find the equation of the line AB.

   (ii) Find the equation of the line through O which is perpendicular to the line AB.

   (iii) Find the coordinates of the point of contact of line AB with the circle.

31. Find the value of k, if the area of quadrilateral is 72sq.units whose vertices are taken in order $A(-5,7)$ $B(-4, k), C(-1, -6)$ and $D(4,5)$.

32. Show that the given points form a parallelogram $A(2.5,3.5), B(10, -4), C(2.5, -2.5)$ and $D(-5,5)$.

33. Find the equation of a lines, whose sum and product of intercepts are 1 and -6.

34. Find the equation of a straight line joining the point of intersection of $3x + y + 2 = 0$ and

$x - 2y - 4 = 0$ to the point of intersection of $7x - 3y = -12$ and $2y = x + 3$.

35. A circular garden is bounded by East Avenue and Cross Road. Cross Road

    intersects North Street at D and East Avenue at E. AD is tangential to the

    circular garden at $A(3, 10)$ using the figure.
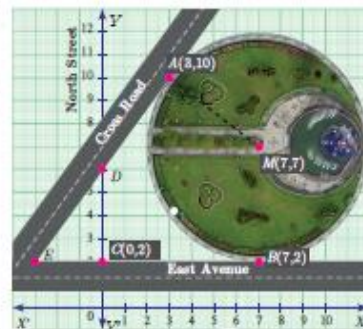
    (a) Find the equation of (i) East Avenue. (ii) North Street (iii) Cross Road

    (b) Where does the Cross Road intersect the (i) East Avenue? (ii) North Street

36. A line makes positive intercepts on co-ordinate axes whose sum is 7 and it passes through $(-3,8)$ find its

    equation.

37. A quadrilateral has vertices at $A(-4, -2), B(5, -1), C(6,5)$ and $D(-7,6)$. Show that the midpoints of its

    sides form a parallelogram.

38. If the points $P(-1, -4), Q(b, c)$ and $R(5, -1)$ are collinear and if $2b + c = 4$ then find the values of b

    and c.

39. Find the area of the quadrilateral whose vertices are at $(-9,0)(-8,6)(-1, -2)$ and $(-6, -3)$.

40. The given diagram shows a plan for constructing a new parking lot at a campus.

    It is estimated that such construction would cost $Rs. 1300$ per square feet. What

    will be the total cost for making the parking lot?
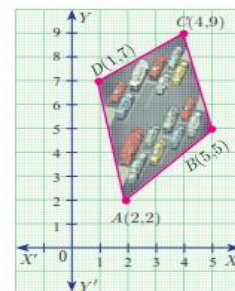
41. If the points $A(2,2), B(-2, -3), C(1, -3)$ and $D(x, y)$ form a parallelogram, then find the value of x and y.

42. Prove analytically that the line segment joining the midpoints of two sides of a triangle is parallel to the

    third side and is equal to half of its length.

PART-D $2 \times 8 = 16$

Note: Answer ALL the questions.

43. (a)Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{7}{4}$ of the corresponding sides of

the triangle PQR (scale factor $\frac{7}{4} > 1$)   (**or**)

(b) Draw the two tangents from a point which is $5cm$ away from the centre of a circle of diameter $6cm$.

Also measure the lengths of the tangents.

44.   (a) A garment shop announces a flat 50% discount on every purchase of items for their customers.

Draw the graph for the relation between the marked price and the discount.

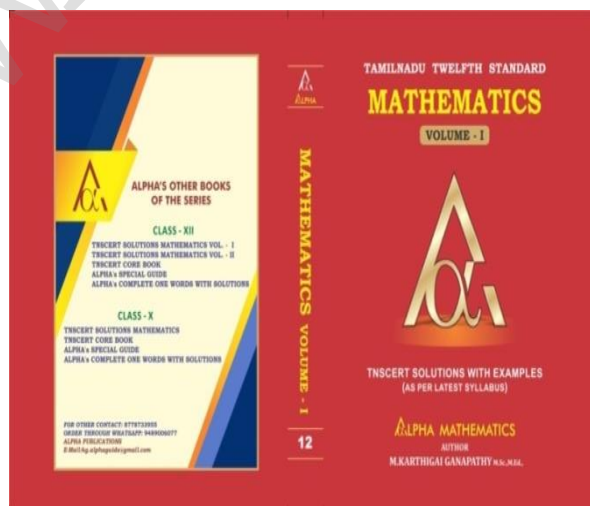Hence find (i) the marked price when a customer gets a discount of $Rs.\,3250$ (from graph)

(ii) the discount when the marked price is $Rs.\,2500$

(**or**)

(b)Draw the graph of $y = x^2 + x$ and hence solve $x^2 + 1 = 0$.

*************** *ALL THE BEST* *************

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