

**MAYILADUTHURAI DISTRICT - Common Revision Test - 2 (2023)195****10 - Mathematics - District Level Revision Test -2 (2023)**

10th Standard

Maths

Date : 06-Feb-23

Reg.No. :      **Draw Diagrams whenever necessary****Rough Works may be done at the bottom of answer sheets**

Exam Time : 03:15:00 Hrs

Total Marks : 100

14 x 1 = 14

**Choose The Best Answer**

- 1) If there are 1024 relations from a set  $A = \{1, 2, 3, 4, 5\}$  to a set B, then the number of elements in B is  
(a) 3 (b) 2 (c) 4 (d) 8
- 2) The probability of an impossible event is \_\_\_\_\_  
(a) 0 (b) 1 (c)  $\frac{1}{2}$  (d) Not exists
- 3) The two tangents from an external points P to a circle with centre at O are PA and PB. If  $\angle APB = 70^\circ$  then the value of  $\angle AOB$  is  
(a)  $100^\circ$  (b)  $110^\circ$  (c)  $120^\circ$  (d)  $130^\circ$
- 4) The slope of the line joining (12, 3), (4, a) is  $\frac{1}{8}$ . The value of 'a' is  
(a) 1 (b) 4 (c) -5 (d) 2
- 5) If  $x = a \tan \theta$  and  $y = b \sec \theta$  then  
(a)  $\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$  (b)  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$  (c)  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  (d)  $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$
- 6) Find the matrix X if  $2X + \begin{pmatrix} 1 & 3 \\ 5 & 7 \end{pmatrix} = \begin{pmatrix} 5 & 7 \\ 9 & 5 \end{pmatrix}$   
(a)  $\begin{pmatrix} -2 & -2 \\ 2 & -1 \end{pmatrix}$  (b)  $\begin{pmatrix} 2 & 2 \\ 2 & -1 \end{pmatrix}$  (c)  $\begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$  (d)  $\begin{pmatrix} 2 & 1 \\ 2 & 2 \end{pmatrix}$
- 7) If  $(x - 6)$  is the HCF of  $x^2 - 2x - 24$  and  $x^2 - kx - 6$  then the value of k is  
(a) 3 (b) 5 (c) 6 (d) 8
- 8) Sum of deviations of a variable from its mean is always \_\_\_\_\_  
(a) 0 (b) 1 (c) 2 (d) 5
- 9) If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is  
(a) 1:2 (b) 1:4 (c) 1:6 (d) 1:8
- 10) Let f and g be two functions given by  
 $f = \{(0, 1), (2, 0), (3, -4), (4, 2), (5, 7)\}$   
 $g = \{(0, 2), (1, 0), (2, 4), (-4, 2), (7, 0)\}$  then the range of  $f \circ g$  is  
(a)  $\{0, 2, 3, 4, 5\}$  (b)  $\{-4, 1, 0, 2, 7\}$  (c)  $\{1, 2, 3, 4, 5\}$  (d)  $\{0, 1, 2\}$

- 11) If  $\triangle ABC$  is an isosceles triangle with  $\angle C = 90^\circ$  and  $AC = 5$  cm, then  $AB$  is  
 (a) 2.5 cm (b) 5 cm (c) 10 cm (d)  $5\sqrt{2}$ cm
- 12) An A.P. consists of 31 terms. If its 16<sup>th</sup> term is  $m$ , then the sum of all the terms of this A.P. is  
 (a) 16  $m$  (b) 62  $m$  (c) 31  $m$  (d)  $\frac{31}{2} m$
- 13) A straight line has equation  $8y = 4x + 21$ . Which of the following is true  
 (a) The slope is 0.5 and the y intercept is 2.6  
 (b) The slope is 5 and the y intercept is 1.6  
 (c) The slope is 0.5 and the y intercept is 1.6  
 (d) The slope is 5 and the y intercept is 2.6
- 14) The total surface area of a cylinder whose radius is  $\frac{1}{3}$  of its height is  
 (a)  $\frac{9\pi h^2}{8}$  sq.units (b)  $24\pi h^2$  sq.units (c)  $\frac{8\pi h^2}{9}$  sq.units (d)  $\frac{56\pi h^2}{9}$  sq.units

**Answer any 10**

$$10 \times 2 = 20$$

Question Number 28 is Compulsory

- 15) Check whether  $AD$  is bisector  $\angle A$  of  $\triangle ABC$  in each of the following  $AB = 5$ cm,  $AC = 10$ cm,  $BD = 1.5$ cm and  $CD = 3.5$ cm
- 16) Determine the quadratic equations, whose sum and product of roots are  $-9, 20$
- 17) A man has 532 flower pots. He wants to arrange them in rows such that each row contains 21 flower pots. Find the number of completed rows and how many flower pots are left over.
- 18) Find the angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of a tower of height  $10\sqrt{3}$ m
- 19) Write the sample space for selecting two balls from a bag containing 6 balls numbered 1 to 6 (using tree diagram).
- 20) Represent the function  $f = \{(1,2),(2,2),(3,2),(4,3),(5,4)\}$  through  
 (i) an arrow diagram  
 (ii) a table form  
 (iii) a graph
- 21) If  $P(A) = 0.37$ ,  $P(B) = 0.42$ ,  $P(A \cap B) = 0.09$  then find  $P(A \cup B)$ .
- 22) What is the remainder when  $3^{209} + 5^9$  is divided by 8?
- 23) Find the sum of the following  
 $3, 7, 11, \dots$  up to 40 terms
- 24) What happens to the volume of the cylinder with radius  $r$  and height  $h$ , when its  
 (a) radius is halved (b) height is halved
- 25) If  $A = \begin{bmatrix} \sqrt{7} & -3 \\ -\sqrt{5} & 2 \\ \sqrt{3} & -5 \end{bmatrix}$  then find the transpose of  $-A$ .
- 26) The length of a tangent from a point at a distance of 5 cm from the center of the circle is 4 cm. Find the radius of the circle

- 27) Find the equation of a straight line passing through the mid-point of a line segment joining the points (1, -5), (4, 2) and parallel to: X axis
- 28) Let  $f = \{(x, y) \mid x, y \in \mathbb{N} \text{ and } y = 2x\}$ . be a relation on  $\mathbb{N}$ . Find the domain, co-domain and range. Is this relation a function?

**Answer any 10**

10 x 5 = 50

Question Number 42 is Compulsory

- 29) Find the GCD of the following by division algorithm  $2x^4 + 13x^3 + 27x^2 + 23x + 7$ ,  $x^3 + 3x^2 + 3x + 1$ ,  $x^2 + 2x + 1$
- 30) State and Prove - Angle Bisector Theorem
- 31) From the top of a tree of height 13 m the angle of elevation and depression of the top and bottom of another tree are  $45^\circ$  and  $30^\circ$  respectively. Find the height of the second tree. ( $\sqrt{3} = 1.732$ )
- 32) Find the probability of choosing a spade or a heart card from a deck of cards.
- 33) Find the equation of a straight line Passing through (1, -4) and has intercepts which are in the ratio 2:5
- 34) Find the value of k, such that  $f \circ g = g \circ f$   
 $f(x) = 3x + 2$ ,  $g(x) = 6x - k$
- 35) A company has four categories of employees given by Assistants (A), Clerks (C), Managers (M) and an Executive Officer (E). The company provides Rs.10,000, Rs.25,000, Rs.50,000 and Rs.1,00,000 as salaries to the people who work in the categories A, C, M and E respectively. If  $A_1, A_2, A_3, A_4$  and  $A_5$  were Assistants;  $C_1, C_2, C_3, C_4$  were Clerks;  $M_1, M_2, M_3$  were managers and  $E_1, E_2$  were Executive officers and if the relation R is defined by  $xRy$ , where x is the salary given to person y, express the relation R through an ordered pair and an arrow diagram.
- 36) If a, b, c are three consecutive terms of an A.P. and x, y, z are three consecutive terms of G.P then prove that  $x^{b-c} \times y^{c-a} \times z^{a-b} = 1$
- 37) Priya earned Rs.15,000 in the first month. Thereafter her salary increased by Rs 1500 per year. Her expenses are Rs.13,000 during the first year and the expenses increases by Rs.900 per year. How long will it take for her to save Rs.20,000 per month
- 38) If  $9x^4 + 12x^3 + 28x^2 + ax + b$  is a perfect square, find the values of a and b.
- 39) 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)
- 40) If  $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$  show that  $A^2 - 5A + 7I_2 = 0$
- 41) Two dice are numbered 1,2,3,4,5,6 and 1,1,2,2,3,3 respectively. They are rolled and the sum of the numbers on them is noted. Find the probability of getting each sum from 2 to 9 separately.
- 42) The frustum shaped outer portion of the table lamp has to be painted including the top part. Find the total cost of painting the lamp if the cost of painting 1 sq.cm is Rs.2.



**Answer the Follwoing**

2 x 8 = 16

- 43) a) Draw the graph of  $y = x^2 + 3x + 2$  and use it to solve  $x^2 + 2x + 1 = 0$   
(OR)
- b) 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
- the marked price when a customer gets a discount of Rs.3250 (from graph)
  - the discount when the marked price is Rs.2500.
- 44) a) Construct a  $\triangle ABC$  such that  $AB = 5.5$  cm,  $\angle C = 25^\circ$  and the altitude from C to AB is 4 cm.  
(OR)
- b) Draw a circle of radius 3 cm. Take a point P on this circle and draw a tangent at P.

----All the Best----

\*\*\*\*\*