Total Time: 2 Hours　　　　**MATHEMATICS (X)**　　　　**Max. Marks: 100**

SECTION "A" MULTIPLE CHOICE QUESTIONS

NOTE: (i) Attempt all the questions of this section.
(ii) Do not copy down the questions, write only the answer against the proper number of the question and its part according to the question paper.
(iii) Each question carries (TWO) mark.

Q.1 Choose the best answer from the given options:　　　　**(50 Marks)**

(i)　　$A \Delta B = $ _____.

　　a) $A \cap B$　　　　b) $A \cup B$　　　　c) $(A \cap B) - (A \cup B)$　　　　d) $(A \cup B) - (A \cap B)$

(ii)　　The set of first three prime numbers is:

　　a) {2, 3, 5}　　　　b) {1, 2, 3}　　　　c) {1, 3, 5}　　　　d) {1, 2, 7}

(iii)　　If x, y, z are real number and $x = y$, $y = z$ then $x = z$, the property used is called _____.
　　a) Transitive　　　　b) Trichotomy　　　　c) Symmetric　　　　d) Identity

(iv)　　$5^{3^2} \div 5^{2^3} = $ _____
　　a) 0　　　　b) 1　　　　c) 5　　　　d) 25

(v)　　The characteristics of log 0.00396 is _____.

　　a) $\bar{3}$　　　　b) 3　　　　c) $\bar{2}$　　　　d) 4

(vi)　　If $\log_2 x = 3$ then x will be equal to:

　　a) 6　　　　b) 8　　　　c) 10　　　　d) 5

(vii)　　The natural logarithm has the base _____.

　　a) π　　　　b) e　　　　c) 10　　　　d) 0

(viii)　　$(7 - \sqrt{2})(7 + \sqrt{2}) = $ _____
　　a) 47　　　　b) 1　　　　c) 5　　　　d) 48

(ix)   The degree of polynomial $8x^2 y^3 - 5x^2 y^5 - x^3 y^7$ is _____.

a) 5   b) 7   c) 3   d) 9

(x)   The square root of $(a - b)^2$ is:

a) $\pm(a - b)$ b) $\pm(a - b)(a + b)$ c) $\pm(a + b)$ d) none of these

(xi)   The L.C.M of $x^3 - y^3$ and $x^6 - y^6$ is _____.

a) $x^3 - y^3$ b) $x^3 + y^3$ c) $x^6 + y^6$ d) $x^6 - y^6$

(xii) $ax^2 + bx + c = 0$, will remain quadratic equation, if

a) $a \neq 0$ and $b = c = 0$ b) $a = 0$ and $b \neq 0$, $c \neq 0$

c) $a \neq 0$ and $c = 0$ d) Both (a) and (c)

(xiii)   The solution set of $|2x + 2| = -3$ is _____.

a) { }   b) {3}   c) {3, -3}   d) {2, -2}

(xiv)   If $\begin{bmatrix} 2 & 3 \\ 4 & p \end{bmatrix}$ is a singular matrix, then p = _____.

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

(xv)   If A = $\begin{bmatrix} 2 & -3 \\ 4 & 5 \end{bmatrix}$ and B = $\begin{bmatrix} 9 & 4 \\ -2 & 7 \end{bmatrix}$, A+B = _____.

a) $\begin{bmatrix} 2 & -3 \\ 4 & 5 \end{bmatrix}$ b) $\begin{bmatrix} 9 & 4 \\ -2 & 7 \end{bmatrix}$ c) $\begin{bmatrix} 11 & 1 \\ 2 & 12 \end{bmatrix}$ d) $\begin{bmatrix} 7 & -7 \\ -6 & 12 \end{bmatrix}$

(xvi)   Eliminate "b" from a + 3b = -1 , a + b = 3, then new relation is _____.

a) a = 5   b) b = 5   c) b = 0   d) a = 3

(xvii) The measure of each angle of an equilateral triangle is _____.

a) 90° b) 45° c) 30° d) 60°

(xviii) The complement of 40° is _____.

a) 60° b) 140° c) 90° d) 50°

(xix) The distance of any point of a circle from its centre is called its

a) Chord   b) Diameter   c) Tangent   d) Radius

(xx) $\text{Sin}\theta \cdot \text{Sec}\theta = $ _____.

a) $\text{Tan}\theta$ b) $\text{Cos}\theta$ c) $\text{Cot}\theta$ d) $\text{Cosec}\theta$

(xxi) $1 + \tan^2 \theta = $ _____.

a) $Sec^2\theta$ b) $Cot^2\theta$ c) $Sin^2\theta$ d) $\tan^2\theta$

(xxiii) A triangle having no side congruent is called _____triangle.

a) Isosceles   b) Scalene   c) Acute   d) Right

(xxiv) $Sin30^o = $ _____.

a) $Sin60^o$ b) $Cos60^o$ c) $Cos30^o$ d) $Sin30^o$

(xxv) The angle inscribed in a major arc is _____ angle.

a) Acute   b) 180° c) Right   d) Acute

SECTION 'B' SHORT ANSWER QUESTIONS (Marks: 30)

NOTE: Attempt any SIX parts from this section, selecting ONE part from each question.

All questions carry equal marks.

2.   (i)   If $U = \{x \mid x \in N \wedge 1 \leq x \leq 12\}$ $A = \{1, 2, 5, 9\}$ and $B = \{2, 3, 8, 9, 10\}$ prove that $A' \cup B' = (A \cap B)'$.

     (ii) Simplify: $\left\{ \dfrac{(125)^2 \times 8}{(64)^2} \right\}^{\frac{1}{3}}$

3.   (i) Solve with the help of logarithm: $\dfrac{\sqrt{431.5} \times (1.2)^2}{\sqrt[3]{36.98}}$

     (ii) Find the value of $x^2 + y^2 + z^2$ when $x + y + z = \sqrt{7}$ and $xy + yz + zx = 2$

4.   (i) Find the solution set of $|5x - 3| - 6 = 3$

     (ii) What should be added to $4a^4 + 4a^3 + 5a^2 + 2a + 5$ to make it a perfect square?

5.   (i) Find the solution set of the given equations by Cramer's Rule: $2x - 3y = 1$, $x + 4y = 6$

     (ii) Eliminate "t" from the following equations: $\dfrac{x}{a} = \dfrac{1 + t^2}{2t}$, $\dfrac{y}{b} = \dfrac{1 - t^2}{2t}$

6.   (i) Find the solution set of $x^2 + 10x - 24 = 0$ with the help of quadratic formula.

     (ii) Prove that: $\dfrac{\sin \theta}{1 + \cos \theta} + \dfrac{1 + \cos \theta}{\sin \theta} = 2 \csc \theta$

7. (i) Find the solution set of : $\sqrt{4x-5} = \sqrt{3x+7}$

(ii) Find all the trigonometric ratios of the angle of $30°$.

SECTION "C" (DESCRIPTIVE–ANSWER QUESTIONS)   (Marks: 20)

NOTE: Attempt any TWO questions from this section. Including Q. 8 which is compulsory. All questions carry equal marks.

8. Prove that the sum of the measures of the angles of a triangle is $180°$.

9. Factorize any **FOUR** of the following:

   i. $x^4 + x^2 + 1$ ii. $12x^2 - 17xy + 6y^2$

   iii. $y^4 + 2y^3z - 2yz^3 - z^4$ iv. $x^3 - x^2 + 2$

   v. $a^6 - b^6$ vi. $64y^6 + \dfrac{64}{y^6} - 8y^9 + 96y^3$

10. If two lines intersect each other, then vertically opposite angles are congruent. Prove it.

11. Draw a triangle ABC such that $m\overline{AB} = 4.5$cm, $m\overline{BC} = 5$cm and $m\angle B = 60^o$. Write also the steps of construction.