Rammohan College

MATH -H-IDC-1-Tutorial: Mathematics in Daily Life –2025

Full Marks-30 **Time: 00:00**

Attempt any 5 out of the following 7, each carries 3 marks.

1. Represent the sets $A = \{x \mid x \text{ is a natural number less than } 10\}$ and $B = \{x \mid x \text{ is an even natural number l}$ in roster form and find $A - B$.

2. Use the Division Algorithm to find the quotient and remainder when 259 is divided by 13.

3. Convert the decimal number 57 into binary form.

4. Determine whether 713 is divisible by 11 using the divisibility test.

5. Write the truth table for the proposition $(p \wedge \neg q) \vee q$.

6. Define "objective function" and "decision variables" with one real-life example of a Linear Programming Problem.

7. Find the simple interest on Rs. 8,000 for 3 years at 6% per annum.

Attempt any 3 out of the following 5, each carries 5 marks.

8. Draw a Venn diagram to represent $(A \cup B) \cap C$ and explain the steps. Using an example, verify the formula
$$n(A \cup B) = n(A) + n(B) - n(A \cap B).$$

9. Solve the Linear Diophantine equation $35x + 22y = 1$ for integer solutions. Give one real-life application.

10. Write the statement of the Fundamental Theorem of Arithmetic and explain its significance. Show how the prime factorization of 504 can be found.

11. Construct the truth tables for $p \to q$ and $q \to p$. Determine whether they are logically equivalent.

12. Formulate and solve a Linear Programming Problem by the graphical method for the following: A carpenter makes chairs and tables. Each chair takes 2 hours of carpentry and 3 hours of painting. Each table takes 3 hours of carpentry and 2 hours of painting. The carpenter has 12 hours of carpentry time and 12 hours of painting time per week. Profit per chair is Rs. 30 and per table is Rs. 40. Determine the number of chairs and tables he should produce for maximum profit.