# SHRI RAMSWAROOP MEMORIAL UNIVERSITY

## End Semester Examination (2021-22)-Odd Semester

| MCA – I Year (I Sem) | |
|---|---|
| **Course Name: Discrete Mathematics** | **Code: MMA1010** |
| **Time: 02 Hours** | **Max Marks: 60** |

| **University Roll No.** | | | | | | | | | | | | | | | | |
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| | **(To be filled by the Student)** | | | | | | | | | | | | | | | |

**Note: Please read instructions carefully:**

*a) The question paper has 03 sections and it is compulsory to attempt all sections.*

*b) All questions of Section A are compulsory; questions in Section B and C contain choice.*

| **Section A: Very Short Answer type Questions**<br>**Attempt all the questions.** | | **BL** | **CLO** | **Marks (10)** |
|---|---|---|---|---|
| 1. | Define Multiset and Multiplicity of an element. | BL1 | CLO1 | 02 |
| 2. | Find the truth table of $p \to q$. | BL2 | CLO2 | 02 |
| 3. | If G={1,-1,i,-i} be a multiplicative group. Find the order of (i,-i). | BL2 | CLO3 | 02 |
| 4. | Define regular and connected graph. | BL1 | CLO4 | 02 |
| 5. | Define Tree and its properties. | BL1 | CLO5 | 02 |
| **Section B: Short Answer Type Questions**<br>**Attempt any 03 out of 05 questions.** | | **BL** | **CLO** | **Marks (30)** |
| 1. | Let R be a binary relation defined as $R=\{(a,b) \in R^2 : (a-b) \le 3\}$ determine whether R is equivalence relation. | BL3 | CLO1 | 10 |
| 2. | Show that contrapositive and conditional propositions are logically equivalent. | BL3 | CLO2 | 10 |
| 3. | Show that the multiplicative group $G=\{1, \omega, \omega^2\}$ is cyclic. | BL3 | CLO3 | 10 |
| 4. | Show that the sum of degrees of the vertices in an undirected graph is even. | BL3 | CLO4 | 10 |
| 5. | Show that a+a=a and a.a=a by using Boolean algebra. | BL3 | CLO4 | 10 |

| **Section C: Long Answer Type Questions**<br>**Attempt any 01 out of 04 questions.** | | **BL** | **CLO** | **Marks (20)** |
|---|---|---|---|---|
| 1. | Show that $(A \cup B)' = A' \cap B'$ and $(A \cap B)' = A' \cup B'$ | BL3 | CLO1 | 20 |
| 2. | Show that $1^2 + 2^2 + 3^3 + ..... + n^2 = \frac{n(n+1)(2n+1)}{6}$. | BL4 | CLO2 | 20 |
| 3. | Show that the set {1,2,3,4} is a group under multiplication modulo 5. | BL3 | CLO3 | 20 |
| 4. | Show that a tree with n vertices has (n-1) edges. | BL3 | CLO5 | 20 |

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