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**MA 8351 Discrete Mathematics**

**Important 2mark questions**

**Unit I**

1. Construct the truth table for the following  $P \wedge (P \vee Q)$ .
2. Write the inverse of the statement, "If you work hard then you will be rewarded".
3. Let  $Q(x, y, z)$  denote the statement " $x + y = z$ " defined on the universe of discourse  $Z$ , the set of all integers. What are the truth values of the prepositions  $Q(1, 1, 1)$  and  $Q(1, 1, 2)$ .

**Unit II**

1. Show that in any group of 8 people at least two have birthdays which falls on same day of the week in any given year.
2. How many solutions does the equation,  $x_1 + x_2 + x_3 = 11$  have, where  $x_1, x_2$ , and  $x_3$  are non-negative integers?
3. Solve  $a_n - 5a_{n-1} + 6a_{n-2} = 0$ .

**Unit III**

1. An undirected graph  $G$  has 16 edges and all the vertices are of degree 2. Find the number of vertices.
2. Define incidence matrix of a simple graph.
3. Give an example of a graph which is Hamiltonian but not Eulerian.

**Unit IV**

1. Prove that group homomorphism preserves identity.
2. Prove that in any group, identity elements is the only idempotent element.
3. Prove that every cyclic group is abelian.

**Unit V**

1. Show that the absorption laws are valid in a Boolean algebra.
2. Define partial ordered set.
3. Is it true that every chain with at least three elements is always a complemented lattice? Justify your answer.