MA 8351 Discrete Mathematics

Important 13mark questions

Unit I

1. Using indirect method, show that $R-> \neg Q, RvS, S-> \neg Q, P-> Q => \neg P$.
2. Show that if x and y are integers and both xy and $x + y$ are even, then both x and y are even.

Unit II

1. Determine the number of positive integers n, $1 \le n \le 2000$ that are nit divisible by 2, 3 or 5, but are divisible by 7.
2. Prove by mathematical induction $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$.

Unit III

1. Prove that for a bipartite graph with a vertices has maximum of $\frac{n^2}{4}$ edges.
2. Prove that a group G is disconnected if and only if the vertex set V is partitioned into two non-empty subsets U and W such that there exists no edge in G whose one vertex is in U and one vertex is in W.

Unit IV

1. Prove that every finite group of order n is isomorphic to a permutation group of degree n.
2. Prove that intersection of two normal subgroups of a group G is, again a normal subgroup of G.

Unit V

1. State and prove distributive inequalities in lattices.
2. Prove that every chain is a distributive lattice.