



VIT-AP University, Amaravati

CAT-1

Course Title: Discrete Mathematics
Course Code: MAT1007

Class: Int. M.Tech.
Semester: Winter

- 1) Convert following English sentences into logical expressions
 - a) You cannot ride the roller coaster if you are under 4 feet tall unless you are older than 16 years old. **-4 Marks**
 - b) If a person is female and is a parent, then this person is someone's mother. **-4 Marks**
- 2) We have a combinatorial circuit with three inputs p, q and r. The output of the circuit is given by $[(p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r)] \rightarrow r$. Find whether the output is a tautology or not? **- 10 Marks**
- 3) If the sum of two positive integers is greater than 73 then show that at least one of them is greater than 37. **-10 Marks**
- 4) For what values of x the congruence relation $19x \equiv 4 \pmod{141}$ is valid? **-10 Marks**
- 5) If you have certain number of coins of same denomination, if you equally divided among 3 persons you will have 2 coins; when equally divided among 5 persons you will have 3 coins; and when equally divided among 7 persons you will have 2 coins. Initially how many coins you have? **-12 Marks**