



SRM Institute of Science and Technology

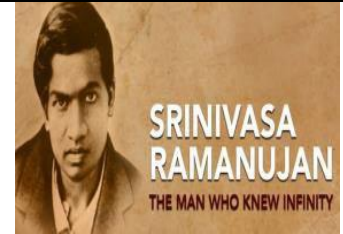
Kattankulathur

DEPARTMENT OF MATHEMATICS

18MAB302T-DISCRETE MATHEMATICS FOR ENGINEERS

UNIT-III MATHEMATICAL LOGICS

Tutorial Sheet -3



Sl.No.	Questions	Answer
Part – A		
1	What are free and bound variables in predicate logic?	
2	Give Converse, Inverse and Contrapositive of a statement of the form, $\forall x (p(x) \rightarrow q(x))$	
3	Symbolize the following expressions: (i) X is the father of the mother of y (ii) Everybody loves a lover	
4	Show that the premises “A student in this class has not read the book” and “Everyone in this class passed the first examination” imply the conclusion “Someone who passed the first examination has not read the book ”	
5	Verify the validity of the following argument: Every living thing is a plant or an animal. Rama’s dog is alive and it is not a plant. All animals have hearts. Therefore Rama’s dog has a heart.	
Part – B		
6	Prove by implication, $\exists x p(x), \forall x (p(x) \rightarrow q(x)) \Rightarrow \exists x q(x)$.	
7	Test the validity of the following argument: If an integer is divisible by 10 then it is divisible by 2. If an integer is divisible by 2, then it is divisible by 3. Therefore the integer divisible by 10 is also divisible by 3.	
8	Show that for all $\forall x (p(x) \rightarrow q(x)) \wedge \forall x (q(x) \rightarrow r(x)) \Rightarrow \forall x (p(x) \rightarrow r(x))$	
9	Use indirect method of proof to show that $(\exists x)(A(x) \wedge B(x)) \Rightarrow (\exists x) A(x) \wedge (\exists x) B(x)$	
10	Let p, q and r be the following statement: p: I will study discrete mathematics. q: I will watch T.V. r: I am in a good mood. Write the following statements in terms of p, q, r and logical connectives. A). If I do not study discrete mathematics and I watch T.V., then I am in a good mood B) If I am in a good mood, then I will study discrete mathematics or I will watch T.V. C) If I am not in a good mood, then I will not watch T.V. or I will study discrete Mathematics. D) I will watch T.V. and I will not study discrete mathematics if and only if I am in a good mood.	

