SRM Institute of Science and Technology
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Department of Mathematics

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Unit III Tutorial sheet - 3

Date: 16/08/2023

Course Code &Title: 18MAB302T-Discrete Mathematics for Engineers
Year & Sem: III/V

Q. No	Questions	Answer Keys
1	Show that the following premises are inconsistent: (i) If Jack misses many classes through illness, then he fails high school. (ii) If Jack fails high school, then he is uneducated (iii) If Jack reads a lot of books then he is not uneducated (iv) Jack misses many classes through illness and reads a lot of book	
2	Using indirect method derive $p \to \neg s$ from the premises $q \to \neg p, p \to (q \vee r), s \to \neg r, p$.	
3	Using proof by contrapositive, show that if $n^3 + 5$ is an odd integer, then n is an even integer.	
4.	Using the principle of Mathematical induction show that $1+2+.....+n = \frac{n(n+1)}{2} \quad \forall n \in \mathbb{N}$	
5.	Examine the validity of the argument, " It is not sunny this afternoon and it is colder than yesterday. We will go for swimming only if it sunny. If we do not go for swimming then we will take a trip. If we take a trip then we will be home by sunset. Therefore, we will be home by sunset."	
6.	Show that $r \to s$ can be derived from the premises $p \to (q \to s)$, $\neg r \vee p$ and q.	
7.	Using the direct method of proof that if n is even then $n^2 + 5$ is odd, $\forall n \in \mathbb{N}$.	
8.	Using indirect method of proof show that q can be derived from $p \to q, \ r \to q, \ s \to (p \vee r)$, and s.	
9.	The rule $((p \to q) \wedge \sim q) \to \sim p$ is recognized as?	Modus Tollens
10.	The dual of the statement $(P \wedge Q) \vee (R \wedge S)$ is	$(P \vee Q) \wedge (R \vee S)$