School of Basic and Applied Sciences

Mathematics
CAT1 - Apr 2022

Time : 90 Minutes **Marks : 30**

Sem II - BBS01T1009 - Discrete Mathematics
Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

1.	State the **converse**, **contrapositive**, and **inverse** of the conditional statements: If it snows today, I will ski tomorrow.	CO1	(2)
2.	A student can choose a computer project from one of three lists. The three lists contain 23, 15, and 19 possible projects, respectively. No project is on more than one list. How many possible projects are there to choose from?	CO2	(2)
3.	Show that $p \rightarrow (p \vee q)$ is a **tautology**.	CO1	(5)
4.	Use **De Morgan's laws** to find the negation of each of the following statements. **a)** Jasbir is rich and happy **b)** Rajan will bicycle or run tomorrow.	CO2	(5)
5.	Find the **Disjunctive Normal Form** (DNF) of $(\sim p \rightarrow r) \wedge (p \leftrightarrow q)$.	CO1	(8)
6.	Prove that $\sqrt{2}$ is irrational by giving a proof by contradiction.	CO2	(8)