Tutorial 2

1. Using the rules of inference, determine whether the following inference patterns are valid or not.

$$\begin{array}{l} \sim t \rightarrow \sim r \\ \sim s \\ t \rightarrow w \\ r \vee s \\ \hline \therefore w \end{array}$$

2. Show that $[(P \vee Q) \wedge \sim (\sim P \wedge (\sim Q \vee \sim R))] \vee (\sim P \wedge \sim Q) \vee (\sim P \wedge \sim R)$ is a tautology by using laws of logic.

3. Show that $(\sim P \wedge (\sim Q \wedge R)) \vee (Q \wedge R) \vee (P \wedge R) \equiv R$ using laws of logical equivalence.

4. Prove that the following set of premises is inconsistent:

$$P \rightarrow Q,\ P \rightarrow R,\ Q \rightarrow \sim R,\ P$$

5. Check the validity of the following argument:

"If Roli has completed MBA, then she is assured of a good job. If Roli is assured of a good job, she is happy. Roli is not happy. So, Roli has not completed MBA."

6. Test the validity of the following argument:

If I study, then I will not fail mathematics.

If I do not play basketball, then I will study.

But I failed Mathematics.

Therefore, I played basketball.