

**Discrete Mathematical Structures**  
**Tutorial Week-3****Portions**

- **Rules of Inference**

**1. Test the validity of the following arguments**

1. If there is a strike by students, the examination will be postponed. There was no strike by students.

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∴ The examination was not postponed

2. If there is a strike by students, the examination will be postponed. The examination was not postponed.

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∴ There was no strike by students.

3. If Sheldon acts well, then he gets an Oscar Award. Sheldon does not get an Oscar Award.

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∴ Sheldon does not act well.

4. I will get A grade in DMS or I will not graduate. If I do not graduate, I will join the army. I got grade A.

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∴ I will not join the army.

**2. Test the validity of the following arguments**

**If the band could not play rock music or the refreshments were not delivered on time, then the New Year's party would have been canceled and Alicia would have been angry. If the party were canceled, then refunds would have had to be made. No refunds were made.**

**Therefore the band could play rock music.**

**3. Consider each of the following arguments. If the argument is valid, identify the rule of inference that establishes the validity.**

If Ron's computer program is correct, then he'll be able to complete his computer science assignment in at most two hours.

It takes Ron over two hours to complete his computer science assignment.

Therefore Ron's computer program is not correct.

4. Show that following arguments are valid.

$$\begin{array}{l} (\neg p \vee q) \rightarrow r \\ r \rightarrow (s \vee t) \\ \neg s \wedge \neg u \\ \hline \neg u \rightarrow \neg t \\ \hline \therefore p \end{array}$$

$$\begin{array}{l} p \rightarrow q \\ r \rightarrow \neg q \\ \hline r \\ \hline \therefore \neg p \end{array}$$

$$\begin{array}{l} p \vee q \\ \neg p \vee r \\ \hline \neg r \\ \hline \therefore q \end{array}$$

$$\begin{array}{l} p \rightarrow (q \rightarrow r) \\ p \vee s \\ t \rightarrow q \\ \hline \neg s \\ \hline \therefore \neg r \rightarrow \neg t \end{array}$$