

Due: 24.08.19

Instructor: Dr. Pawan Kumar

### INSTRUCTIONS:

Problems to be discussed in Tutorial in the week 26th Aug-31st Aug 2019.

1. **(PDNF and PCNF)** Write the principal disjunctive normal form and principal conjunctive normal form of the following.
  - (a)  $(\neg P \vee \neg Q) \rightarrow (P \leftrightarrow \neg Q)$
  - (b)  $(P \rightarrow (Q \wedge R)) \wedge (\neg P \rightarrow (\neg Q \wedge \neg R))$
  - (c)  $P \rightarrow (P \wedge (Q \rightarrow P))$
2. **(Implications)** Does the conclusions follows from the given premises? For the last two try CP rule.
  - (a) Premises:  $\neg(P \wedge \neg Q), \neg Q \vee R, \neg R$ . Conclusion:  $\neg P$
  - (b) Premises:  $(A \rightarrow B) \wedge (A \rightarrow C), \neg(B \wedge C), D \vee A$ . Conclusion:  $D$
  - (c) Premises:  $\neg J \rightarrow (M \vee N), (H \vee G) \rightarrow \neg J, H \vee G$ . Conclusion:  $M \vee N$ .
  - (d) Premises:  $\neg P \vee Q, \neg Q \vee R, R \rightarrow S$ . Conclusion:  $P \rightarrow S$ .
  - (e) Premises:  $(P \vee Q) \rightarrow R$ . Conclusion:  $(P \wedge Q) \rightarrow R$ .