
Name:

Entry No.:

1. [1 marks] Given the premises $(p \rightarrow q)$ and $(r \rightarrow s)$, use resolution to prove the conclusion $(p \vee r \rightarrow q \vee s)$.
2. [1 marks] Suppose that F and G are formulas such that $F \models G$. Show that if F and G have no variable in common then either F is unsatisfiable or G is valid.
3. [0.75 marks] Give a natural deduction proof of validity of the sequent $(p \vee q) \vee r \vdash p \vee (q \vee r)$.
4. [0.75 marks] Give a natural deduction proof of the law of excluded middle using basic proof rules.
5. [0.5 marks] Use LEM to prove the validity of the sequent $p \rightarrow q \vdash \neg p \vee q$.