

**ICS 253–Discrete Structures I, Winter 2008****Quiz: 1****Section: 2****Time: 10 minutes**

Name:

ID#:

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**Question 1: [4 marks]**

a) Define the propositions  $p =$  “this quiz is difficult” and  $q =$  “you studied propositional logic”. Write a logical expression for the statement “this quiz is not difficult if you studied propositional logic; otherwise, it is.”

a) Prove that  $p \vee (p \wedge q) \equiv p$ , where  $p$  and  $q$  are any propositions.

**Question 2: [6 marks]**

a) For each of the following statements, state whether it is a tautology **T**, a contradiction **F**, or a contingency **C**.

(a)  $p \vee \neg p$

(b)  $p \wedge T$

(c)  $p \wedge q \rightarrow p \vee q$

b) Without using truth tables, prove that  $(q \vee \neg p) \wedge \neg q \rightarrow \neg p$  is a tautology.