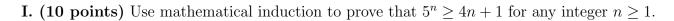
Math175 - Discrete Mathematics - Spring 2005

Exam #1, April 28, 2005

In the following problems you are required to show all your work and provide the necessary explanations everywhere to get full credit.



II. (10 points) Consider various ways of ordering the letters in the word EXCELLENCE:

EEXCLLENCE, LENCEEXCEL, LEXCNCEEEL, and so on.

How many distinguishable orderings are there?

III. (10 points) Construct a truth table for the statement form $(\sim p \to q) \land (q \lor r)$.

IV. (10 points) Use a truth table to show that the following argument form is valid:

$$p \to q$$

$$\sim q$$

$$\sim r$$

$$\therefore \sim (p \vee r)$$

\mathbf{V} .	(10)	points)	Use the	theorem	about	logical	equival	ences to	prove	that
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$$(\sim p \lor q) \land (p \land (p \land q)) \equiv p \land q.$$

VI. (10 points) Derive the following set property from those given in the theorem about set identities and theorem about set properties that involve \varnothing :

For all sets A and B we have $A \cap [(B \cup A^c) \cap B^c] = \emptyset$.