CSci 1302 Assignment 2

Due Wedn., February 8 in class

Problem 1 (24 points). Prove the following:

1. $(p \rightarrow q) \vee (p \rightarrow r) \vee p$ is a tautology,

2. $(p \rightarrow q) \wedge (p \rightarrow r) \wedge p \equiv p \wedge q \wedge r$

3. $p \rightarrow (q \rightarrow r) \equiv (p \wedge q) \rightarrow r$

4. $p \vee (q \wedge r \wedge s) \equiv (p \vee q) \wedge (p \vee r) \wedge (p \vee s)$

5. $(p \wedge q \wedge r) \vee s \equiv (p \vee s) \wedge (q \vee s) \wedge (r \vee s)$

6. $p \leftrightarrow (q \wedge r) \equiv (p \rightarrow q) \wedge (p \rightarrow r) \wedge (\tilde{\ } p \rightarrow^{\tilde{\ }} (q \wedge r))$

Problem 2 (4 points). Exercise 18 p. 27

Problem 3 (3 points). Exercise 34 p. 28 (write all the statements as formulas, explain your answer clearly).

Problem 4 (2 points). Exercise 42 p. 28.

Problem 5 (2 points). Exercises 44, 46 p. 28.

Problem 6 (6 points). Exercises 10, 11, 12 p. 41.

Problem 7 (6 points). Exercises 42, 44 p. 43.