COT 3100 In-class Exercise 3 Solution

Name: USF ID:

**Problem 1 Rewrite the statements without using the word necessary or sufficient.**

1. Doing homework regularly is a necessary condition for Jim to pass the course.
2. If Jim pass the course, then he did his homework regularly.
3. If Jim does not do homework regularly, then he cannot pass the course.
4. A sufficient condition for Jon’s team to win the championship is that it win the rest of its games.

If Jon’s team wins the rest of its games, then it will win the championship.

**Problem 2** A set of premises and a conclusion are given. Use the valid argument forms listed in Table 2.3.1 to deduce the conclusion from the premises, showing the argument form for each step. Assume all variables are statement variables.

a. p →q

b. r ∨ s

c. ∼s →∼t

d. ∼q ∨ s

e. ∼s

f. ∼p ∧ r → u

g. w ∨ t

h. ∴ u ∧ w

(1). ∼s →∼t by premise (c)

~s by premise (e)

~t by Modus Ponens

(2) w ∨ t by premise (g)

~t by (1)

w by Elimination

(3) ∼q ∨ s by premise (d)

~s by premise (e)

~q by Elimination

(4) p →q by premise (a)

~q by (3)

~p by Modus Tollens

(5) r ∨ s by premise (b)

~s by premise (e)

r by Elimination

(6) ~p by (4)

r by (5)

∼p ∧ r by Conjunction

(7) ∼p ∧ r → u by premise (f)

∼p ∧ r by (6)

u by Modus Ponens

(8) u by (7)

w by (2)

u ∧ w by Conjunction