Name _____

Points (20) _____

Intermediate Logic

Homework #28

(Due: 5/7/2013)

Read pages 127-139 in the *Intermediate Logic* text and complete the exercises.

Exercise 30 (p. 132): Using the method of truth trees, determine the consistency of the following sets of propositions. Recover the truth values for all consistent sets.

1. {P, ~Q • R}

2. {~~P, ~P • Q}

3. {P, ~Q, ~P v ~~Q}

4. {~P • Q, Q v R}

Exercise 31 (pages 138-139): Using the method of truth trees, determine the consistency of the following sets of propositions. Recover the truth values for all consistent sets.

1. { A ⊃ B, A, ~B }   2. {~C, ~(C ⊃ D)}

3. { E ⊃ ~F, ~E • F }   4. { G ≡ H, ~H, G }

5. { J ⊃ ~(J ≡ K), ~(J ⊃ K)}   6. { L ⊃ M, M ⊃ L, ~(L ≡ M)}

Cranium Calisthenics

The Lady or the Tiger?[*] - (The Fourth Day, Twelfth Trial) "Horrible!" said the king. "It seems I can't make my puzzles hard enough to trap these fellows! Well, we have only one more trial to go, but this time I'll really give the prisoner a run for his money!"

Well, the king was as good as his word. Instead of having three rooms for the prisoner to choose from, he gave him nine! As he explained, only one room contained a lady; each of the other eight either contained a tiger or was empty. And, the king added, the sign on the door of the room containing the lady is true; the signs on doors of all rooms containing tigers are false; and the signs on doors of empty rooms can be either true or false. Here are the signs:

I	II	III
THE LADY IS IN AN ODD-NUMBERED ROOM	THIS ROOM IS EMPTY	EITHER SIGN V IS RIGHT OR SIGN VII IS WRONG

IV	V	VI
SIGN I IS WRONG	EITHER SIGN II OR SIGN IV IS RIGHT	SIGN III IS WRONG

VII	VIII	IX
THE LADY IS NOT IN ROOM I	THIS ROOM CONTAINS A TIGER AND ROOM IX IS EMPTY	THIS ROOM CONTAINS A TIGER AND VI IS WRONG

The prisoner studied the situation for a long while. "The problem is unsolvable!" he exclaimed angrily. "That's not fair!"

"I know," laughed the king.

"Very funny!" replied the prisoner, "Come on, now, at least give me a decent clue: is Room Eight empty or not?" The king was decent enough to tell him whether Room VIII was empty or not, and the prisoner was then able to deduce where the lady was. Which room contained the lady? Try to solve this on your own. Think it through! If you are truly stuck, check out the website Hints page for a little help. You may write an explanation on the back or write what you deduce (whether it is T/F and what it contains) on each sign.

---

[*] *The Lady or the Tiger? And Other Logic Puzzles*, by Raymond Smullyan. Random House, Inc. 1982.