**Take Home Exam 1**



**Question 1**

(p) (q ) p q by the second De Morgan law

p  by the truth table for

p  by the double negation law

p p by truth table for

p by the truth table for

p by the second De Morgan law

p by the second De Morgan law

p by the Distributive law (1)

p by the Idempot. and Comm. law (1)

p by the Idempotent law (1)

p by the Distributive law (1)

by the Idempot.and Comm. law(1)

(p ) () by the Comm. law (1) and Idempot. law (2)

**Question 2**

1. Two different interns in the same faculty cannot have the same employee id number.

1. There are some interns in all faculties who are supervised by no one but themselves.

*x*

1. At most two interns can be admitted to each job position in the medicine faculty.

((x ) ))

**Question 3**

1: (p ) Premise

2: Premise

15: 3 – 14,

a.

3: r Assumption

5: p p 4, 4,

13: 6 – 12,

14: p

4: Assumption

7: r Assumption

8: q 3, 7,

9: 6 , 8,

10: p 9,

6: Assumption

11: r 7 – 10,

12: p

b.

11: 1 – 10,

1: (q ) *q*  Assumption

9:  2 – 8,

10: q 9,

2:  Assumption

6: q 3 – 5,

7: q 1 ,6,

8: 2 - 7,

3:  Assumption

4: 2 , 3,

5: p 4,

**Question 4**

a.

3: Pt Assumption

10: P(t) 4 – 9,

11: 3 – 10,

t fresh name

2: Pt

12: Pt 3 – 11,

13: Pt 12,

5: Assumption

6: Pt 4 – 5,

7:

4: P(t) Assumption

8: 5 – 7,

9: 8,

Premise

1: Premise

2: x Premise

12: 2, 3 - 11,

13: 12

t fresh name

1

4 - 10

c fresh name

4:

10: 5 - 9

5: Assumption

6:

6 – 8,

7: Assumption

6, 7,

b.