

School of Law, Kanazawa University
 Special Lecture on Jurisprudence, Midterm Examination
 11 May 2017, Hidehiko ADACHI
 Answers

1. Translate these English sentences into wff. (3 points)

(a) Either both A and B or C.

$$((A \cdot B) \vee C)$$

(b) If A, then B or C.

$$(A \supset (B \vee C))$$

(c) If A then B, or C

$$((A \supset B) \vee C)$$

2. Calculate each truth value. (3 points)

(a) $(0 \cdot 1)$

$$=0$$

(b) (~ 0)

$$=1$$

(c) $(1 \supset 0)$

$$=0$$

3. Do a truth table for each formula. (4 points)

(a) $(\sim P \cdot Q)$

| P | Q | $\sim P \cdot Q$ |
|-----|-----|------------------|
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 0 |
| 1 | 1 | 0 |

(b) $((P \cdot \sim Q) \supset R)$

| P | Q | R | $((P \cdot \sim Q) \supset R)$ |
|-----|-----|-----|--------------------------------|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 |

4. Prove each of these arguments to be valid or invalid. (20 points)

(a) *1
 $(A \supset B)$
 $(\sim A \supset B)$
 $\therefore B$

(b) *2
 $((A \supset (B \supset C)))$
 $\therefore ((A \cdot B) \supset C)$

(c) *3
 $(A \supset B)$
 $(C \supset B)$
 $\therefore (A \supset C)$

(d) *4
 $(A \equiv B)$
 $(C \supset B)$
 $\sim (C \cdot D)$
 D
 $\therefore \sim A$

(e) *5
 $(A \supset B)$
 $(A \vee (A \cdot C))$
 $\therefore (A \cdot B)$

*1 Harry J. Gensler, Introduction to Logic (3rd ed. Routledge 2017) 7.1a Exercise: 3.

*2 7.1a, 10.

*3 7.2a, 2.

*4 7.2a, 6.

*5 7.3a, 1.