



**Name:** \_\_\_\_\_ **Score:** \_\_\_\_\_

**Year & Section:** \_\_\_\_\_ **Professor:** \_\_\_\_\_

- I. Determine whether each of the following statements is a proposition or not. Write **P** for proposition and **NP** for Not Proposition.

- \_\_\_\_\_ 1. Toronto is the capital of Canada.  
\_\_\_\_\_ 2.  $2 + 2 = 3$ .  
\_\_\_\_\_ 3. What time is it?  
\_\_\_\_\_ 4.  $2^n \geq 100$ .  
\_\_\_\_\_ 5. Answer this question.

- II. Express each of these propositions as an English sentence.

**Given:**

- p:** You have the flu.  
**q:** You miss the final examination.  
**r:** You pass the course.

1.  $p \rightarrow q =$  \_\_\_\_\_  
\_\_\_\_\_

2.  $\neg q \leftrightarrow r =$  \_\_\_\_\_  
\_\_\_\_\_

3.  $q \rightarrow \neg r =$  \_\_\_\_\_  
\_\_\_\_\_

4.  $p \vee q \vee r =$  \_\_\_\_\_  
\_\_\_\_\_

5.  $(p \rightarrow \neg r) \vee (q \rightarrow \neg r) =$  \_\_\_\_\_  
\_\_\_\_\_

III. Construct a truth table for  $(p \vee q) \wedge (\neg p \vee q) \wedge (p \vee \neg q) \wedge (\neg p \vee \neg q)$ .

| $p$ | $q$ |  |  |  |  |  |  |  |  |  |
|-----|-----|--|--|--|--|--|--|--|--|--|
| T   | T   |  |  |  |  |  |  |  |  |  |
| T   | F   |  |  |  |  |  |  |  |  |  |
| F   | T   |  |  |  |  |  |  |  |  |  |
| F   | F   |  |  |  |  |  |  |  |  |  |

Construct a truth table for  $p \rightarrow [(\sim q \vee r)]$ .

| $p$ | $q$ | $r$ |  |  |  |  |
|-----|-----|-----|--|--|--|--|
| T   | T   | T   |  |  |  |  |
| T   | T   | F   |  |  |  |  |
| T   | F   | T   |  |  |  |  |
| T   | F   | F   |  |  |  |  |
| F   | T   | T   |  |  |  |  |
| F   | T   | F   |  |  |  |  |
| F   | F   | T   |  |  |  |  |
| F   | F   | F   |  |  |  |  |

IV. Use truth table to verify the logical equivalence  
 $(p \rightarrow r) \wedge (q \rightarrow r) \equiv (p \vee q) \rightarrow r$