



Name: Score:
Year & Section: Professor:

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

1. Look out!
2. $2 + 2x = 5$
3. This sentence is false.
4. $x + 2 = 2x$ when $x = -2$.
5. The Earth is further from the sun than Venus.

II. Convert the given statement into if-then form, converse, inverse and contrapositive.

1. Join this fitness program and you will lose weight.

If-Then:

Converse:

Inverse:

Contrapositive:

2. You are safe if you stay at home.

If-Then:

Converse:

Inverse:

Contrapositive:

III. A. Translate each English sentences into propositional logic.

q: You have age proof.

r: Your age is less than 18 years.

s: You are allowed to watch adult movies.

1. Your age is not less than 18 years.
2. Either you have age proof or your age is less than 18 years, but not both.
3. You are allowed to watch adult movies if your age is not less than 18 years.

B. Translate each propositional logic into English sentences.

1. $\sim s$:

2. $r \rightarrow \sim s$:

3. $s \leftrightarrow (\sim r \wedge q)$:

IV. Construct a truth table for $\sim r \rightarrow [(r \wedge s \rightarrow t)]$.

r	s	t				
T	T	T				
T	T	F				
T	F	T				
T	F	F				
F	T	T				
F	T	F				
F	F	T				
F	F	F				

V. Using a truth table, determine whether the following propositions are logically equivalent: $p \vee (p \wedge q) \equiv p$.

p	q			
T	T			
T	T			
T	F			
T	F			

VI. Prove the validity of the argument: "It is not sunny this afternoon and it is colder than yesterday. We will go swimming if it is sunny. If we do not go swimming, then we will take a canoe trip. If we take a canoe trip, then we will be home by sunset. Therefore, we will be home by sunset."
(p,q,r,s,t)

Premise 1: It is not sunny this afternoon and it is colder than yesterday

Premise 2: We will go swimming if it is sunny

Premise 3: If we do not go swimming, then we will take a canoe trip.

Premise 4: If we take a canoe trip, then we will be home by sunset

Conclusion: Therefore, we will be home by sunset

Step #	Proposition	Reason
1		Premise 1
2		Premise 2
3		Premise 3
4		Premise 4
5	$\sim p$	
6		Modus Tollens (2, 5)
7	s	
8		Modus Ponens (4, 7)