



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2013/2014

**SECOND YEAR SECOND SEMESTER EXAMINATIONS FOR THE
DEGREE BACHELOR OF EDUCATION (ARTS) WITH INFORMATION
TECHNOLOGY**

(MAIN CAMPUS)

APH 203: SYMBOLIC LOGIC

Date: 10th April, 2014

Time: 8.30 - 10.45am

INSTRUCTIONS:

- Answer QUESTION FIVE and any other TWO questions.



Instructions!

Answer question 5 and any TWO others!

Question 5 has 30 marks and the others 20 marks each!

1. (a) Assess the value of special symbols in logic vis-à-vis the use of ordinary language.
(b) Define the symbols used in terms of statement variables, statement constants, truth functional connectives, and punctuation.
2. (a) Explain the parts of and symbolize conjunctive, negative, disjunctive, and conditional statements.
(b) Illustrate the 2 types of disjunctive propositions, and 4 types of conditional statements and state the partial common meanings that both the "vel" , \vee , and the "horseshoe", \supset , symbols represent.
3. (a) Describe material implication and symbolize it in its 3 distinct but related formats.
(b) State the meanings and distinguish, illustrating with examples, between (i) arguments and argument forms; (ii) statements and statement forms.
(c) What is material equivalence? How is logical equivalence illustrated through material equivalence? Use the appropriate symbols in illustrating.
4. (a) Define and distinguish, using symbols, between argument form, substitution instance, and specific form.
(b) Explain and illustrate through an examples the methods used for proving validity. State the strengths and weaknesses of each method.

5. (a) For each of the following formal proofs state the justification for each line that is not a premise!

(i) 1. $W \supset X$

2. $(W \supset Y) \supset (Z \vee X)$

3. $(W \cdot X) \supset Y$

4. $\sim Z / \therefore X$

5. $W \supset (W \cdot X)$

6. $W \supset Y$

7. $Z \vee X$

8. X

(ii) 1. $A \cdot B$

2. $(A \vee C) \supset D / \therefore A \cdot D$

3. A

4. $A \vee C$

5. D

6. $A \cdot D$

(b) Add just two statements to the premises of the arguments below to produce a formal proof for each of them!

(i) 1. $(M \supset N) \cdot (M \supset O)$

2. $N \supset O / \therefore M \supset O$

(ii) 1. A

2. $B / \therefore (A \vee C) \cdot B$

(c) Add just three lines to the premises of the arguments below to produce a formal proof for each of them!

(i) 1. $\sim X \supset Y$

2. $Z \supset X$

3. $\sim X / \therefore \sim Z$

(ii) 1. $A \vee (B \supset A)$

2. $\sim A \cdot C / \therefore \sim B$

6 (a) state and symbolize the rules of replacement.

(b) Provide a proof of invalidity for the arguments below

(i) 1. $A \supset C$

2. $C \supset D$

3. $A \vee D / \therefore B \vee C$

(ii) 1. $\sim (E \cdot F)$

2. $(\sim E \cdot F) \supset (G \cdot H)$

3. $H \supset G / \therefore G$