MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2012/2013

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

ARE 203: SYMBOLIC LOGIC

Date: 25th July, 2013   Time: 8.30 – 10.30 a.m..

ARE 203: SYMBOLIC LOGIC

MASENO CAMPUS

Instructions: Answer question 1 and any two others.

1.   (a) Define each of the following arguments and then use both truth tables and the formal proof of validity to test their validity:

(i) $p \supset q$
$-q$
therefore $-p$

(ii) $p \supset q$
$-p$
therefore: $-q$

(ii) $(p \supset q) \vee (r \supset s)$
     $(p \vee r)$
     therefore: $(q \vee s)$

[b] Which of the three is a fallacy and why?
(30 marks).

2.   (a) What are the distinguishing characteristics between an argument and an argument form?

[b] What is meant by the statement that a bi-conditional combining any of the three statements below shall always be a tautology?

     (i) $-p \vee q$ (ii) $-(p . -q)$ (iii) $p \supset q$ (20 marks).

3. [a] What is the place of logical equivalence in rule of replacement?
    [b] Use examples to illustrate the 19 rules of inference used in constructing formal proofs of validity.   (20 marks).

4. [a] What is the proof of invalidity and what determines it?

    [b] Use the proof of invalidity to prove the following arguments invalid!

[i] $p \supset q$

      $\neg p$

therefore $\neg q$

[ii] $p \supset q$

      q

therefore, p   **(20 marks).**

[5] [a] What are the key methodologies used in determining validity or invalidity of arguments in propositional logic? Illustrate with examples. !

[b] What is the importance of punctuation and how is done?

[c] What is the value of special symbols?   **(20 marks).**

[6] [a] How many kind of conditional statements are there and what do they have to do with material implication?

   [b] What exactly does the "$\supset$" ['horse shoe'] represent?

   [c] What do the exclusive and inclusive disjunctive statements have in common that the "v" ['vel'] represents?

(20 marks).