MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF HUMANITIES AND SOCIAL SCIENCE

DEPARTMENT OF SOCIAL SCIENCES

SECOND YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR OF ARTS

APH 200: SYMBOLIC LOGIC

DATE: 5/12/2017 **TIME: 2:00 – 4:00 PM**

INSTRUCTIONS.

Answer Question One and Any Other Two Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

Explain the following:

a) Atomic statement (2 marks)
b) Compound statement (2 marks)
c) Symbolic logic (2 marks)
d) What is the main idea of truth tables? (4 marks)
e) List the five symbols, their names, translations and their type of compound. (20 marks)

QUESTION TWO (20 MARKS)

Construct truth tables to determine whether the following arguments are valid (10 marks)

a. $(A \cdot {\sim}B) \therefore {\sim}(A \supset B)$
b. ${\sim}(H \cdot K) \therefore ({\sim}H \cdot {\sim}K)$
c. $A \therefore [(A \vee B) \cdot (A \cdot B)]$
d. ${\sim}(H \equiv J) \therefore ({\sim}H \equiv {\sim}J)$

QUESTION THREE (20 MARKS)

Use abbreviated truth tables to determine validity and invalidity of the following arguments

(20 marks)

a. $\sim (A \cdot B).(\sim A \supset C). (\sim B \supset D) \therefore (C \cdot D)$
b. $[\sim (V \cdot X) \supset \sim Y] \therefore \sim [(V \cdot X) \supset Y]$
c. $\sim (A \vee B) \therefore (A \supset B)$
d. $[A \vee (B \cdot C) \therefore [(A \cdot B) \vee ((A \cdot B)]$

QUESTION FOUR (20 MARKS)

I. Explain the following

a) Tautology (2 marks)
b) Contradiction (2 marks)
c) Contingency (2 marks)
d) Logical equivalence (2 marks)

II. Use truth tables to determine the following statements are Tautology, Contradiction, Contingency andLogical equivalence.

a. $[\sim A \supset (A \supset B)]$
b. $[B \supset (A \supset B)]$
c. $[R \cdot \sim R) \supset S]$
d. $Q \equiv \sim\sim Q$

(16 marks)

QUESTION FIVE (20 MARKS)

I. What is the rationale of the truth tree method? (6 marks)

II. Determine using truth tree method whether the following symbolic arguments are valid? (14 marks)

a. $\sim R)$
$S \supset R$
$\therefore \sim S$

b) $\sim G \supset \sim (A \vee B)$
$\sim B$
$\sim G$
$\therefore D$