MACHAKOS UNIVERSITY

University Examinations for 2022/2023 Academic Year

SCHOOL OF HUMANTIES AND SOCIAL SCIENCES

DEPARTMENT OF SOCIAL SCIENCES

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF ARTS (PUBLIC ADMINIRATION)

BACHELOR OF EDUCATION (ARTS)

APH 200 SYMBOLIC LOGIC

DATE: 7/3/2023 **TIME: 2.00-4.00 PM**

INSTRUCTIONS:

Answer Question One and Any Other Two Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

Explain the following:

a) What is the rationale of symbolic logic? (10 marks)

b) List the five logical operators, their names, their logical function and translations. (20 marks)

QUESTION TWO (20 MARKS)

a) What is the main idea of truth tables? (4 marks)

b) Construct truth tables to determine whether the following arguments are valid or invalid

a. $(A \vee C).\ {\sim}A\ /\ \therefore C$

b. $Q.\ (P \bullet R).\ (P \bullet R) \supset Q\ /\ \therefore\ {\sim}P$ (16 marks)

QUESTION THREE (20 MARKS)

a) What is the rationale of the short truth table? (4 marks)

b) Use any version of the abbreviated truth tables to determine validity and invalidity of the following arguments (16 marks)

i. $(P \vee Q).\ {\sim}Q\ /\ \therefore {\sim}P$

ii. $P \supset (Q \supset R),\ P \supset Q\ /\ \therefore R$

QUESTION FOUR (20 MARKS)

a) What is the rationale of the truth tree method? (4 marks)

b) Determine using truth tree method whether the following symbolic arguments are valid? (16 marks)

a)

1. $C \supset A$
2. $A \supset B \bullet D$
3. $C \ / \ \therefore B$

b)

1. $(A \supset B)$
2. $(C \supset D)$
3. $(B \vee C) \ / \ \therefore A \vee D$

QUESTION FIVE (20 MARKS)

a) Illustrate the truth tree rules for the five logical operators. (5 marks)

b) Determine using truth tree method whether the following symbolic arguments are valid? (16 marks)

a)

1. $F \supset (G \supset H)$
2. $/ \therefore (\sim H \bullet K) \supset (G \supset \sim F)$

b)

$(H \bullet K) \supset L$

$H \ / \ \therefore K \supset L$