NATIONAL OPEN UNIVERSITY OF NIGERIA
91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI, ABUJA
FACULTY OF ARTS
DEPARTMENT OF PHILOSOPHY
2025_2 EXAMINATIONS

Course Code: PHL 301
Course Title: Symbolic Logic
Credit Units: 3
Time Allowed: 3 Hours
Instruction: Answer any four questions. Each question carries equal marks of 17.5%.

1a.   Well-formed formulas: Which of the following symbolic expressions are well-formed formulas (WFFs)?

   i. $(\sim A \supset (\sim B \supset C)$
   ii. $(A \lor \sim B \cdot \sim \sim C)$

1b.   Symbolize the following statements by using the schemes of abbreviation provided.

   i.   Given that Inoke is talented and hardworking, he will succeed; but Inoke is not hardworking. (T: Inoke is talented; H: Inoke is hardworking; S: Inoke will succeed)
   ii.   The statement "Ghosts exist" is not false. (G: Ghosts exist)

2a.   Truth values: Determine the truth value of the following statement.

   i.   If Tinubu is in Aso Rock, then either Tinubu is in Lagos or Tinubu is in Abuja.

2b.   Use short truth tables to determine which of the following argument is valid or invalid.

   i. $A \supset (B \supset C)$ $\therefore A \supset (B \cdot C)$

3a.   Construct truth tables to determine whether the following argument is valid.

   i. $B \supset \sim C$ $\therefore \sim (B \equiv C)$

3b.   Tautologies, contradictions and nature contingent statements: Use truth tables to determine the nature of the following statements.

   i. $(C \equiv B) \supset (B \lor A)$

ii.   (~ A • ~ B) v C

4a.   Construction of proofs: Construct proofs to show the following symbolic arguments are valid.

i.   (P v Q) ⊃ Y, Y ⊃ G, P   ∴ G v S
ii.   ~ ~ X, Q, Y v ~ X, (Y • Q) ⊃ (E v G), ~ E   ∴ G

4b.   English Arguments: Symbolize the following argument to shoe valid.

i.   Civil disobedience can be moral if either the government breaches the terms and agreements of the social contract or the government abuses its powers. Either the government breaches the terms and agreements of the social contract or the government abuses its powers. Consequently, civil disobedience can be moral or the people have a genuine grievance.

5a.   Proofs using Conditional Proof and Reductio ad Absurdum: Construct proofs to show that the following symbolic arguments are valid.

i.   (S • ~ B) ⊃ P, S, ~ P v O   ∴ B v O

ii.   X v (P • ~ O), (X v P) ⊃ M, M ⊃ O   ∴ X

5b. Construction of proofs: Using Conditional Proof or Reductio ad Absurdum, construct proofs to show that the following symbolic arguments are valid.

i.   (∃y) (Ty ⊃ My), Tg   ∴ Mg
ii.   (x) (Ax ≡ Cx), (x) ~ ~ (Ax v Cx)   ∴ (x) (Ax • Cx)

5c.   Proofs: Construct proofs to show that the following arguments are valid.

i.   ~ (x) (Qx • ~ Rx), ~ (∃x) (Rx • ~ Sx)   ∴ (∃x) (~ Qx v Sx)

ii.   ~ (x) (Rx v Mx), (∃x) (Hx ⊃ Rx)   ∴ ~ (∃x) Hx