



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

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**COURSE CODE:** PHL431:

**COURSE TITLE:** FURTHER LOGIC (2 CREDIT UNITS)

**TIME:** 2&1/2HRS

**INSTRUCTIONS:** Answer questions 1&2 and any other one of your choice.

1. a. What do you understand by Predicate Logic or Quantificational Logic? **11 marks**  
b. With at least two examples, each, demonstrate the difference between Quantificational Logic and Propositional Logic. **15 Marks**
  
2. a. With one example for each, what do you understand by these terms?
  - i. Propositional Function
  - ii. Substitution Instance
  - iii. Instantiation
  - iv. Individual Constant
  - v. Individual Variable.
  - vi. Quantification **12 Marks, 2 Marks for Each**b. Symbolize the following showing their Subject and Predicate terms. (Use individual Constant instead of Variables):
  - i. Nkem is hardworking.
  - ii. Policemen are Sadists
  - iii. The street are flooded
  - iv. Students are demonstrating.
  - v. University Education is over subscribed
  - vi. Ukaegbu is well-behaved. **12Marks, 2Marks for Each.**
  
3. Symbolize the following showing their Subject and Predicate terms. (Use propositional function instead of individual Constants):
  - a. Agu is hardworking
  - b. Nwagu is hardworking
  - c. Ijoma is hardworking
  - d. Ukaegbu is hardworking. **12 Marks, 3 Marks for Each**b. Explain the following terms:

- i. Relational Proposition
  - ii. Dyadic Proposition
  - iii. Universal Generalization
  - iv. Existential Generalization **8 Marks, 2 Marks for Each**
4. a. Symbolize the following showing their Subject and predicate terms and adding the logical operators or connectives already discussed in Propositional Logic:
- i. Agu is hardworking and Ezinne is beautiful.
  - ii. If it is raining outside, then the streets are flooded.
  - iii. Either Ijoma qualifies for the National Art Exhibition, or he will secure a scholarship for further studies.
  - iv. Moralists are humanists if and only if Sadists are moralists.
  - v. Students are not hardworking **10 Marks, 2 Marks for each.**
- b. Symbolize the following universal quantifier expressions using propositional functions instead of individual Constant.
- i. Given any individual, that individual is beautiful
  - ii. Given any individual that individual is hardworking
  - iii. Given any individual that individual is a Sadist
  - ii. Given any individual that individual is a Moralist
  - iii. Given any individual that individual is a democrat **10 Marks, 2 Marks for Each**