



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
University Village, Plot 91, Jabi Cadastral Zone, Nnamdi Azikiwe Expressway, Abuja

**FACULTY OF SCIENCES**  
**Computer Science Department**  
**2023\_1 POP EXAMINATION**

Course Code: CIT383

Course Title: Introduction to Object-Oriented Programming

Credit: 2 Units

Time Allowed: 2 hours

Instruction: Answer Questions One (1) and any other TWO (2) questions

**Question One (30 marks) COMPULSORY**

- 1 (a) Describe Polymorphism and discuss two major types. (5 marks)
- 1 (b) List three examples of message passing styles. (3 marks)
- 1 (c) Consider a Java package named – *Employee* – with the following classes – *Name*, *Address*, *Department* – write the syntax for:
- importing each class individually (for all classes).
  - importing all classes (at the same time).
  - Instantiating an object of the classes – *Name* and *Address*. (7 marks)
- 1 (d) Describe the term *Data Hiding*. (5 marks)
- 1 (e) Create a *Rectangle* class that has two private instance variables – *width* & *height*. The class should have three constructors that can be used to manipulate these instance variables (i.e. no variable, 1 variable, 2 variables.). (10 marks)

**Question Two**

- 2 (a) Write an executable Java class to print out the message “I am the best programmer in the world”. (9 marks)
- 2 (b) Outline two functions of a destructor. (3 marks)
- 2 (c) What two (2) attributes differentiates a constructor from a method. (2 marks)
- 2 (d) Describe three (3) advantages of bundling code into individual software objects. (6 marks)

### Questions Three

- 3 (a) Outline the visibility of the class when declared using the following keywords:  
(i) *public*  
(ii) *private*  
(iii) *protected*  
(iv) *final*  
**(4 marks)**
- 3 (b) Describe composition. **(3 marks)**
- 3 (c) Describe Abstraction and include one example of abstraction you know.  
**(4 marks)**
- 3 (d) For the *Rectangle* class that you created in questions one, write a public method named – *getArea* – that calculates and returns the area. **(4 marks)**
- 3 (e) Describe (i) abstract method (ii) final method **(4 marks)**

### Question Four

- 4 (a) Outline and describe the motivations for modularising a program into methods.  
**(6 marks)**
- 4 (b) Create an executable class that accepts two numbers from users, the class should have a method that finds the difference of the two numbers; the method should be called to display the difference of the two numbers. **(8 marks)**
- 4 (c) State two limitations of overloading True and False operators. **(2 marks)**
- 4 (d) Identify the components of a method signature **(3 marks)**

### Question Five

- 5 (a) Fully describe the term *Recursive Method*. **(3 marks)**
- 5 (b) Using recursion, write a method that finds the factorial of numbers. Your method should be used in an application that finds the factorial of the first 10 numbers.  
**(10 marks)**
- 5 (c) Differentiate between an implicit cast and an explicit cast. **(3 marks)**
- 5 (d) Outline the stand syntax used to declare an indexer. **(4 marks)**