00331

THE OPEN UNIVERSITY OF SRI LANKA
B.Sc (IT) DEGREE PROGRAMME
LEVEL 04
COU4300 – Object Oriented Programing
Final Examination Paper: 2026/2027
Duration: Two hours only (02 hours)

Date: 18.06.2026 Time: 9.30 am – 11.30 am

INSTRUCTIONS TO CANDIDATES

- This paper contains **Six (06)** questions and **Five (05)** pages.
- **Duration** of the examination is **two (02)** hours.
- **Question 01 is compulsory and must be answered by all candidates.**
- In addition to Question 01, answer **any three (03)** questions from **Questions 02 to 06.**
- Write your **index number** clearly on the **cover of the answer book** and on **all extra sheets used.**
- Clearly indicate the **question numbers** you are attempting in your answer script.
- **Begin** each answer on a **new page.**
- All answers **must be written in English.**
- State assumptions clearly, if any are made.
- **Do not use red pens.** Only **blue** or **black** pens are allowed for writing answers.
- **Attach all additional sheets** securely to your main answer script before handing it in.
- **This is a closed-book examination. No reference materials, textbooks, or electronic devices are allowed.**
- Candidates are reminded to maintain **academic integrity.** Any form of **cheating or misconduct will result in disciplinary action.**

Question 01 – Compulsory (40 marks)

01. Define the following terms and give one suitable example for each: **(04 Marks)**
    - Attribute
    - Method

02. Explain the purpose of constructors. Name **two** (02) types of constructors available in Java. **(04 Marks)**

03. **State four** (04) primitive data types available in Java **and** give one example value for each. **(04 Marks)**

04. Fill in the blanks to complete the following Java program. **(04 Marks)**

```
(a)  _______ java.util.Scanner;
class Test{
  public static void main(String[] args){
      Scanner input = new Scanner(System.in);
      System.out.print("Enter age: ");
      int age = input. (b) _______();
      System.out.println("Age = " + (c) _______);
      input.(d) _______();
  }
}
```

05. How is an object different from a class? State **two** (02) differences. **(04 Marks)**

06. List **four** (04) access modifiers available in Java. Briefly explain their accessibility. **(06 Marks)**

07. Write the output. **(04 Marks)**

```
int x = 5;
System.out.println(++x);
System.out.println(x++);
```

08. What will be the output? **(04 Marks)**

```
String name = "Object";
```

```
System.out.println(name.toUpperCase());
```

09. Write a Java statement to find the length of an array named **values**. **(04Marks)**

```
int[] values = {10, 20, 30, 40, 50};
```

10. What is the **default value** of an integer variable in Java? **(02 Marks)**

Question 02 – (20 marks)

a. Explain the concept of **inheritance** in Object-Oriented Programming. **(03 Marks)**

b. How is the super keyword used to invoke the constructor of a superclass? **(04 Marks)**

c. What is code reusability? How does inheritance support code reusability? **(05 Marks)**

d. A university maintains information about academic staff. Implement a class **Staff** with attributes **staffID** and **staffName** and a method **displayInfo()**. Implement a subclass **Lecturer** with an additional attribute **LecSpecialization** and override **displayInfo()** to display all details. **(08 Marks)**

Expected output:

```
Staff ID: 1001
Staff Name: Dr. Silva
Specialization: Computer Science
```

Question 03 – (20 marks)

a. What is meant by **data hiding**? **(03 Marks)**

b. List **four** (04) advantages of using encapsulation. **(04 Marks)**

c. How would changing public fields to private improve the class design? **(05 Marks)**

d. Implement a class **Customer** with private attributes **customerID** and **customerName**. Include:

- Constructor
- Getter methods
- Setter methods
- **displayCustomer()** method

Create an object and display customer information. **(8 Marks)**

Expected output:

```
Customer ID : C001
Customer Name : Nimal Perera
```

Question 04 – (20 marks)

a. Define **polymorphism.** **(03 Marks)**

b. What is method overriding? **(04 Marks)**

c. Explain the difference between **compile-time polymorphism** and **runtime polymorphism** **(05 Marks)**

d. Implement the following:

- Superclass: **Employee**
- Method: **calculateBonus()**
- Subclasses: **Manager** and **Clerk**
- Override **calculateBonus()** appropriately and demonstrate runtime polymorphism.

(08 Marks)

Expected Output:

```
Manager Bonus: Rs. 20,000
Clerk Bonus: Rs. 5,000
```

Question 05 – (20 marks)

a. What is an **abstract method**? **(03 Marks)**

b. Explain the difference between **abstract classes** and **interfaces.** **(04 Marks)**

c. What is the benefit of hiding implementation details in a program? **(05 Marks)**

d. Create an interface **Taxable** with a method **calculateTax()**. Implement a class **Product** with attributes **productName** and **price.** **(08 Marks)**

- Calculate the tax using the formula:

  Tax = price × 15 / 100

- Create an object and display the tax amount.

Expected Output:

```
Product Name: Laptop
Price: 100000.0
Tax Amount: 15000.0
```

Question 06 – (20 marks)

a. What is a **static** method and state one advantage of using static methods. **(03 Marks)**

b. Define the **this** keyword in Java. How is it used to distinguish instance variables from local variables? **(04 Marks)**

c. Explain the purpose of the **final** keyword in Java. Discuss its use with variables, methods, and classes. **(05 Marks)**

d. Implement a class **LibraryBook** with the following requirements:

- Private attributes: **bookID** and **title**
- Overloaded constructors
- Static variable **bookCount**
- Use of **this** keyword
- Method **displayBook()**

Create two objects and display the details and total number of books created. **(08 Marks)**

Expected Output:

```
Book ID: 0
Title: Unknown

Book ID: 101
Title: Java Programming

Total Books Created: 2
```

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