



UNIVERSITY COLLEGE TATI (UC TATI)

FINAL EXAMINATION QUESTION BOOKLET

COURSE CODE	: BCS 2233
COURSE	: OBJECT ORIENTED PROGRAMMING
SEMESTER/SESSION	: 1-2023/2024
DURATION	: 3 HOURS

Instructions:

1. This booklet contains 5 questions. Answer ALL questions.
3. All answers should be written in answer booklet.
4. Write legibly and draw sketches wherever required.
5. If in doubt, raise your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 7 PRINTED PAGES INCLUDING COVER PAGE

QUESTION 1

- a) State **FOUR (4)** common types of programming language. (4 marks)
- b) State **FOUR (4)** characteristics of Object Oriented Programming (OOP). (4 marks)
- c) Determine whether the following variable declaration or initialization are valid or invalid (4 marks)
- float +num;
 - char x, X;
 - static final double PI = 3.142;
 - boolean cond = "true";
- d) Write a Java program that prompts the user to enter their name, age and salary. The program should then display the entered information. Sample output as follows: (8 marks)

```
Nama: Nora
Umur: 24
Gaji: 3000.3

Nama saya: Nora
Umur saya: 24tahun
Gaji saya:RM 3000.3
```

QUESTION 2

- a) State the **THREE(3)** iteration statements structure in Java. (3 marks)
- b) Determine the result for each of the following expression. The values for variables a, b, c and d are provided as follows: (4 marks)
- ```
int a = 5, b = 2, c = 3, d = 4;
```
- $a + b * d - c$
  - $a + b * d - c \% 2$
  - $a > d \ \&\& \ c != b$

---

iv. `b + c == a || d == d`

- c) Trace the following program and produce expected output. (9 marks)  
(Assume input: a, b, x)

```
import java.util.Scanner;
public class Main
{
 public static void main(String[] args) {
 char op;
 int x = 0, y = 1;
 do {
 Scanner in = new Scanner(System.in);
 System.out.println("Enter letter a OR b except x to exit");
 op = in.next().charAt(0);
 switch(op){
 case 'a': System.out.println(x = y++);
 case 'b': System.out.println(x++);
 }
 }while(op != 'x');
 }
}
```

### QUESTION 3

**16M**

- a) Write a void method that named 'Identity' that receives a 'name' of type String (4 marks) and 'age' of type integer as its parameters. The method will then print the two received values.
- b) Describe the **THREE (3)** basic syntax elements of a method declaration in Java (6 marks) based on the following syntax.

```
returnType methodName(parameterList) {
 // Method body
}
```

- c) Determine the methods overloading in following program segment and provide your justification: (6 marks)

```
class Calculator {
 int add(int a, int b) {
 return a + b;
 }

 double add(double a, double b) {
 return a + b;
 }
}
```

---

**QUESTION 4**

- a) Describe the following terms in Object Oriented Programming: (10 marks)
- i. Class
  - ii. Instances variable/ data field
  - iii. Constructor
  - iv. Access modifiers
  - v. Object
- b) The following program in Figure 1 defines a class called Figures. Examine the program carefully and complete the following tasks:

```
public class Figures
{
 private double length;
 private double width;
 private double radius;

 public Figures(double l, double w){
 length = l;
 width = w;
 }
 public Figures(double r){
 radius = r;
 }

 public double areaR()
 {
 return length * width;
 }

 public double areaC()
 {
 return Math.PI * radius * radius;
 }
}
```

Figure 1

- i. Construct Unified Modelling Language (UML) class diagram. (8 marks)

- ii. Write a main class (skeleton and program guide provided in Figure 3) that invoke class Figures and produce the following output in Figure 2: (10 marks)

```
Enter length, width (rectangle): 4 5
Enter radius (circle): 2
Rectangle area: 20.0
Circle area: 12.566370614359172
```

Figure 2

```
import java.util.*;
public class FiguresTest
{
 public static void main(String[] args)
 {
 //create Scanner object instance for input
 // prompt and get input for length and width
 // prompt and get input for radius

 // create Figures object instance, invoke constructor with length and
 // width, invoke method areaR() and display rectangle area

 //create Figures object instance, invoke constructor
 // with radius, invoke method areaC() and display circle area
 }
}
```

Figure 3

**QUESTION 5**

- a) Define inheritance and state **TWO(2)** advantages. (4 marks)
- b) Compare method overloading and method overriding. (6 marks)
- c) Examine the following program in Figure 4, which is a class Child extends the class Parent.

```
class Parent {
 public Parent () {
 this.salam();}

 public void salam() {
 System.out.println("Salam sejahtera");}
}

class Child extends Parent {
 public Child () {
 this.salam();}

 public void salam() {
 System.out.println("Assalamualaikum");}
}
```

Figure 4

Consider the following program segment to invoke class Parent and Child:

```
Parent c = new Child();
c.salam();
```

- i. Construct Unified Modelling Language (UML) class diagram. (4 marks)
- ii. Determine the output. (3 marks)
- iii. Identify method overriding involved. (1 mark)
- iv. Identify subclass. (1 mark)
- v. Identify superclass. (1 mark)

-----End of question-----

