



PAN AFRICA CHRISTIAN UNIVERSITY

BBIT, BSIT

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: BIT204, BCIT204

CAMPUS: ROYSAMBU

COURSE TITLE: OBJECT ORIENTED PROGRAMMING 1

EXAM DATE: DAY OF WEEK, DATE (DDTH MONTH YEAR)

TIME: START HOUR – END 13:00-17:00 HRS

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other three questions in Section **B**.
- None programmable calculators permitted
- Calculators on phones, tablets, and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

QUESTION 1

a) It is argued that java is a preferred object-oriented programming language to any programmers. Explain any TWO reasons for this argument. **(2 Marks)**

b) Write a Java program that uses a loop to print all even numbers from 1 to 50. **(3 marks)**

c) Justify your choice of specific type of loop for the task in b) above. **(2 marks)**

d) Study the following code snippet and explain THREE reasons for use of access specifiers **(3 marks)**

```
class Hello{
    protected int data=40;
    private void msg(){System.out.println("Hello java");
}
}
public class Hard
{
    public static void main(String args[])
    {
        A obj=new Hello();
        System.out.println(obj.data);
        obj.msg();
    }
}
```

SECTION B

(Answer any FOUR (3) questions in this section)

QUESTION 2

a) Define a class **Book** with attributes **title**, **author**, and **price**. **(3 marks)**

b) Write a constructor to initialize the attributes defined in a) above. **(3 marks)**

c) Create an object of this class in the main method and display the book's details. **(4 marks)**

marks)

QUESTION 3

- a) Write a Java program that takes three integers as inputs from the user and calculates the average.
(5 marks)
- b) Briefly explain any data types or methods you use in the solution for a) above
(5 marks)

QUESTION 4

- a) Write a Java method **calculateFactorial** that takes an integer **n** as input and returns the **factorial of n**. **(5 marks)**
- b) Discuss how recursion could be applied to solve the factorial problem in a) above. **(5 marks)**

QUESTION 5

- a) Distinguish classes from constructors. **(2 marks)**
- b) Demonstrate how to define a constructor using a java code snippet **(3 marks)**
- c) Write a java program with a base class **Employee** and derived classes **Manager** and **Supervisor**. The base class should pass such features like rollNo, name, and gender to its derived classes and display the results accordingly. **(5 Marks)**

QUESTION 6

Study the program below and use it to answer the following questions

```
public class ArrayOperations {  
    public static void main(String[] args) {  
        // Initialize an array with 5 integers  
        int[] numbers = {12, 45, 23, 56, 39};  
  
        // Find the sum of the array elements  
        int sum = 0;  
        int max = numbers[0]; // Initialize max with the first element  
  
        for (int i = 0; i < numbers.length; i++) {  
            sum += numbers[i]; // Add each element to the sum  
        }  
    }  
}
```

```
// Check if the current element is greater than max
if (numbers[i] > max) {
    max = numbers[i]; // Update max if current element is larger
}

// Display the results
System.out.println("Sum of array elements: " + sum);
System.out.println("Maximum element in the array: " + max);
}
```

a) State the purpose of the sum variable in this program **(1 Mark)**

b) Explain how the program determines the maximum element in the array. **(2 Marks)**

c) Describe how would you modify the code to find the minimum element in the array. **(2 Marks)**

d) Justify the necessity to initialize max with the first element of the array. **(2 Marks)**

e) Modify this program to allow the user to input the 5 integers instead of hardcoding them. **(3 Marks)**

EOF