



PAN AFRICA CHRISTIAN UNIVERSITY

DICT

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: DICT0125

CAMPUS: ROYSAMBU

COURSE TITLE: OBJECT ORIENTED PROGRAMMING

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 many programmers. Explain any THREE reasons against the argument.

(3

Marks)

- b) Using a code snippet, distinguish between WHILE LOOP and DO WHILE LOOP.

(4

Marks)

- c) Identify and fix the errors in the following code:

(3 marks)

```
public class Test {  
    public void main(string[] args) {  
        int i;  
        int k = 100.0;  
        intj = i + 1;  
  
        System.out.println("j is " + j + " and  
            k is " + k);  
    }  
}
```

SECTION B

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

QUESTION 2

- a) You have been approached to write a simple program to determine whether the potential client is under age or an adult and give appropriate advice for a restaurant entry management system. Write down the probable code that you would provide using conditional control structures.

(5 Marks)

- b) Write a program that reads in the radius and length of a cylinder and computes its volume using the following formulas: **(5 marks)**

$$\text{area} = \text{radius} * \text{radius} * \pi$$
$$\text{volume} = \text{area} * \text{length}$$

QUESTION 3

- a) Explain the significance of methods in program development. **(4 Marks)**
- b) Write a method that computes Simple Interest given interest rate, principal for a specified number of years. The principal, rate, and time are passed as parameters. Call the method within main. The Simple Interest is determined using the formula
(Principal * rate * time) / 100. **(6 marks)**

QUESTION 4

- a) Explain the significance of accessors used in the following code snippet. **(6 marks)**

```
public class Circle {  
    public double x,y,r;  
    public double getX() { return x;}  
    public double getY() { return y;}  
    public double getR() { return r;}  
    public double setX(double x_in) { x = x_in;}  
    public double serY(double y_in) { y = y_in;}  
    public double setR(double r_in) { r = r_in;}  
}
```

- b) Using FOR LOOP, write a java program to display **"I am happy today"** five times. **(4 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)**

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- 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)**

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