



Scott Christian UNIVERSITY

SCHOOL OF PROFESSIONAL STUDIES

BACHELOR OF INFORMATION COMMUNICATION TECHNOLOGY

UNIT CODE/NAME: BCT 313: ADVANCED OBJECT ORIENTED PROGRAMMING

September- December 2019/2020 End Semester Exam - Time: 2 Hours

Instructions: Answer Question ONE (Compulsory) and any other TWO questions.

QUESTION ONE

- a) Define the following terms as used Java programming (6 Marks)
 - i) Instance variable
 - ii) Interface
 - iii) Exception
- b) Differentiate between checked and unchecked exceptions (4 Marks)
- c) With aid of java code fragments explain how a superclass constructor can be invoked in a subclass (4 Marks)
- d) Explain the scope of the following access modifiers (4 Marks)
 - i) Protected
 - ii) Private
- e) Using java code fragments show how a method can return an object (6 Marks)
- f) With aid of an example demonstrate how an inner class can be instantiated (5 Marks)
- g) State the reason why interfaces do not have constructors (1 Mark)

* QUESTION TWO

- a) Explain the importance of exception handling in java (1 Marks)
- b) With aid of Java code fragments differentiate between method overloading and method overloading (4 Marks)
- c) Explain the similarities and differences between abstract classes and interfaces (5 Marks)
- d) With aid of java code fragments show the uses of the keyword this (5 Marks)

* QUESTION THREE

- a) Explain the three basic flow control structures in Java (4 Marks)
- b) Differentiate between UDP and TCP (3 Marks)
- c) Describe the client server Model (3 Marks)
- d) Explain the functions of the following networking classes (3 Marks)
 - i. Socket
 - ii. ServerSocketClass
- e) Differentiate between a socket and a port (2 Marks)

QUESTION FOUR

- a) Explain java thread life cycle
- b) Consider the following class definition

(4 Marks) ✓

```
Class Example implements Runnable {  
    public static Object o = new Object();  
    int count = 0;  
    public void run() {  
        while (true) { synchronized (o) {  
            count++; }  
        }  
    }  
}
```

- i. Explain the function of the method synchronized in the code (1 Marks)
 - ii. Show how to start two threads, each executing this run method (4 Marks) ✓
- c) State two uses of nested classes in Java (2 Marks)
- d) Using java code fragments show how a method can take an object as a parameter (4 Marks)

QUESTION FIVE

- a) Change the **divide** method so that it throws **IllegalArgumentException** with an appropriate message if **b** is zero (4 Marks)

```
public static double Divide(double a, double b) {  
    return a / b;  
}
```

- b) Change the method given above so that it catches the **IllegalArgumentException** thrown by divide and prints the message "**the divisor is zero**" if it is thrown. (4 Marks)
 - c) Explain the importance of java generics (2 Marks)
 - d) Using Java code fragments show how to declare and instantiate the generic type (5 Marks)