

FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.
SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY
DEPARTMENT OF INFORMATION & MEDIA TECHNOLOGY
SECOND SEMESTER EXAMINATION, 2011/2012 ACADEMIC SESSION

Course Code: CIT 323
Credit Unit: 3

Course Title: C++ and Java Programming
Time: 2 hours.

Instruction: Answer question ONE and any other three.

1. (a) Study NP and NPApps classes given below and answer the following questions:
- (i) What is the expected output of NPApps program?
 - (ii) Describe what *public String numGenerator(int num)* in NP class is meant to achieve.
- (b) Rewrite NPApps class so that it can accept integer number from user. The number should be passed as argument to *numGenerator()* method call.
- (c) Name and describe the relationship existing between NP and NPApps classes.

```
package cit323labmanual.assignment;
```

```
public class NP {  
    String numP = new String();  
    public String numGenerator(int num) {  
        int a;  
        for (a = 2; a <= num; a++) {  
            int b;  
            for (b = 2; b <= a; b++) {  
                if (a % b == 0) {  
                    break;  
                }  
            }  
            if (b == a) {  
                numP = numP + " " + a;  
            }  
        }  
        return numP.trim();  
    }  
}
```

```
package cit323labmanual.assignment;  
public class NPApps {  
    public static void main(String[] hik) {  
        NP pn = new NP();  
        String pNum = pn.numGenerator(12);  
        System.out.println(pNum);  
    }  
}
```

2. (a) The class AccountManager below contains some syntax errors. Write error free version of the class.

```
public Class AccountManager {  
  
    public String withdrawMoney (float amount) throw AccountException{  
  
        If (amount > 200) throw new AccountException("Insufficient fund");  
        els    return amount + " has been deducted from your account balance";  
    }  
  
    public String depositMoney(float amount) throws AccountException{  
        if (amount <= 0) throw new AccountException("Account cannot be credited");  
        else    return amount + " has been added to your account balance"  
    }  
  
}
```

(b) Explain the following concepts and keywords in Java.

- (i) Garbage Collector
- (ii) try-catch
- (iii) implements
- (iv) package
- (v) final

3. (a) Mention five (5) characteristics of each of the following:

- (i) Class
- (ii) Interface

(b) Write a Java application that will accept two integer numbers from user, compute the Lowest Common Multiple (LCM) for the numbers and display the result.

4. (a) Write C++ program that will display the n^{th} numbers in Fibonacci series.

- (b) (i) Describe checked exception.
- (ii) Mention three (3) advantages of using checked exception.
- (iii) Explain how to handle checked exception to prevent calling program from crashing.

5. (a) Why do you need classes in java.io package as Java programmer?

(b) Arrange each of the following classes as byte based or character based streams.

- (i) OutputStreamWriter
- (ii) FileReader

- (iii) PipedInputStream
- (iv) BufferedOutputStream
- (v) CharacterArrayReader
- (vi) ObjectInputStream

(c) Write a concrete class that will subclass *EngineBlock* written below, the new class should be called *EngineBlockChild*. The *EngineBlockChild* should override *move()* declared in *EngineBlock* and display *Fasten your seat belt and enjoy a trip to Java world* when invoked.

```
public abstract class EngineBlock {  
  
    float capacity;  
    int numberOfCylinder;  
  
    EngineBlock() {  
    }  
  
    public void engage();  
    public void move() {  
    }  
}
```

6. (a) Write a thread class that subclass `java.lang.Thread`, the class should be called `CitThread`. The `CitThread` should display message "Welcome to IMT Dept" when it runs.
- (b) Write Java application called `CitThreadApps` that will create an instance of `CitThread` and run the thread.
- (c) Draw a well labeled diagram of Java Thread Life Cycle.
- (d) Explain the meaning of the following thread states:
- (i) Running (ii) Sleeping (iii) Born/New

Good luck!