Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

III SEMESTER B.TECH. (INFORMATION TECHNOLOGY/COMPUTER AND COMMUNICATION ENGINEERING) END SEMESTER EXAMINATIONS, NOV 2017

SUBJECT: OBJECT ORIENTED PROGRAMMING [ICT 2101]

REVISED CREDIT SYSTEM
(16/11/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data, if any, may be suitably assumed.

1A. Create a class Employee with data members: id, name, salary and department. From this class, derive class Manager which contains an ArrayList of 5 subordinate Employees.
In main method:
1. Create an object of Manager, populate all the details and display them.
2. Using an object of Manager, display all subordinate Employees of "HR" department.
3. Using an object of Manager, display salaries of all subordinate Employees in descending order. (Use appropriate constructors and methods wherever necessary) **5**

1B. Differentiate between final, finally and finalize using suitable examples. **3**

1C. Predict and justify the output for the following code snippets.

i)
```
class P1
 {
   public static void main(String args[])
   {
      byte a=30,b=20;
      b=assign(a);
      System.out.println(b);
   }
   static byte assign(byte a)
   {
        int  c =a+100;
        return (byte)c;
   }
}
```

ii)
```
class P2
   {
     public static void main(String args[])
     {
        int x=5,y;
        y= ++x  +  x++  +  --x;
        System.out.println( y);
     }
}
```

2

2A. What are light weight and heavy weight components? Create a swing application which accepts main string and a substring as input, and displays the number of occurrences of the substring in the main string. **5**

2B Create a class Rectangle with data members: length, breadth, area and an abstract method displayArea(). Create a subclass Square from Rectangle, which has data member: side and method displayArea(). Write a java program to display the area of both square and rectangle. **3**

2C. Predict and justify the output for the following code snippets.

```
i) class P3
   {   static String str="s";
    public static void main(String args[])
    {     new P3().method1();
          System.out.println(str);
    }
    void method1() {
    try {   method2();  }
    catch(Exception e) {   str += "e"; }
    finally { str +="c";  } }
    void method2() throws Exception{
     try {   method3();
            str += "c"; }
     catch(Exception e) {
           throw e;   }
     finally {  str +="j";  }
     method3();
     str += "d";  }
    void method3() throws Exception {
     throw new Exception();  } }
```

```
ii) class P4
   {
      public static void main(String args[])
      {
       System.out.println("A" + "B" + 'A');
      }
   }
```

2

3A. Write a java program to write the students detail into two files "test1.txt" and "test2.txt ". Write the registration number, name and marks obtained in first test into "test1.txt", and same details obtained in second test into "test2.txt". Read the contents of "test1.txt" and "test2.txt", and create a new file "result.txt" with fields namely registration number, name, first test mark, second test mark and the total mark. Read "result.txt" and display only the student's detail whose total mark is more than 80. 5

3B. Create a superclass Vehicle and subclasses Plane and Ship. Vehicle class contains a final method transportMode(), which displays appropriate message as follows:

i) When called with respect to the Vehicle object, displays the message "travels on land only ",

ii) When called with respect to the Plane object, displays the message "travels in air only",

iii) When called with respect to the Ship object, displays the message "travels in water only"

The transportMode() method has the following signature : final void transportMode();
Write a java program to implement the above scenario, with a constraint that the derived classes should be completely empty. 3

3C. What is nested class? Mention the types of nested class with suitable examples. 2

4A. Create an interface "SharedConstants" with members PI=3.142 and R = 5 defined in package "pkg1.test1". In another package "pkg2.test2", create two classes namely Circle and Cylinder to compute area. These classes use constants from package "pkg1.test1". Write a java program to compute and display areas. Use appropriate constructors, methods and user inputs as required to achieve the above functionalities. 5

4B. Create a class Palindrome with a String as its data member and it should override the equals (Object obj) method. This method checks if the entered word is "Palindrome or not". The signature of equals method is : public boolean equals(Object obj);
Example: If the entered word is: racecar, then output will be "Entered word is Palindrome". 3

4C. Write a program to print Floyd's triangle as below:

1
2 3
4 5 6
7 8 9 10
.....
79 91

2

5A. Write a complete java program to do the following:

Take the following input as command line arguments and store it into an array.

0	1	2	3	4	5	6	7
59890	99453	47673	48798	66578	99100	34768	871

Create a new user defined exception class named "MyException". If number of elements in the array is less than 10, **throw MyException** which prints the message in main as "Input less than 10". Define a class ChildThread which creates two child threads :

Thread-1 performs the following function: The index position which are multiples of 2, their content has to be divided by 2 and old value has to be concatenated with the result obtained from division of 2.

Example:

0	1	2	3	4	5	6	7
5989029945	99453	4767323836	48798	6657833289	99100	3476817384	871

Thread 2 performs the function of displaying the resultant sorted array.

871 99100 99453 3476817384 4767323836 5989029945 6657833289

5

5B. What is synchronization? Explain with suitable example, how synchronization is implemented in java. 3

5C. Write a Java program to convert the given Indian currency into Dollars or Euros using command line arguments. First parameter indicates the choice: 1 (to convert into Dollars), 2 (to convert into Euros) and second parameter in the command line indicates the amount to be converted. [Assume 1 Dollar =65 INR, 1 Euro =75 INR] 2