Question Paper

Exam Date & Time: 16-Dec-2022 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

THIRD SEMESTER B.TECH. (INFORMATION TECHNOLOGY) EXAMINATIONS - DECEMBER 2022
SUBJECT : ICT 2155 - OBJECT ORIENTED PROGRAMMING

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

1A)	Write a Java program to do the following. i) Define a class Person with a protected data member name. and getName() and putName() as member functions to read and display the value of the data member. It also has getData() and isOutstanding() functions. ii) Class Student and Professor. Student class has CGPA as private datamember. Class Professor has no ofpublications as private data member. iii) A student class overrides getData() and isOutstanding() mehods. A student is considered as outstanding if he/she has scored CGPA>9. iv) A professor is declared as outstanding if he/she has published more than 100 papers. v) In the main function, create an array of objects of the class Person. Initialize these objects of Student or Professor class based on user choice for N persons. Finally, the program should display the names of the outstanding persons.	(5)
1B)	Which variable is used to locate .class files in java? Demonstrate the uses of final keyword in java with example code snippets.	(3)

1C)	What is the output of the following code snippets? Justify.
	i) `int i=256;`
	`System.out.println((byte) i);`
	
	ii) `byte b=10;`
	`b = b * 2;`
	`System.out.println(b);`
		(2)

2A)	Create a class named BankAccount which contains balance and account number as integer. Create two methods Deposit() and withdraw(). The following Java application must perform the transactions in a bank concurrently for a particular account. Using thread create appropriate classes to implement and display the Balance after every Deposit and withdraw. Demonstrate the program by providing proper inputs and comments.	(5)
2B)	Write a Java program with method EliminateDuplicate() that returns a new array by removing duplicate values in the array. Show the method usage in test class that reads in ten integers and displays the result. Expected output: Enter ten numbers: 1 2 3 2 1 6 3 4 5 2 The distinct numbers are: 1 2 3 6 4 5	(3)
2C)	How overloading is different from overriding? Also find the output for the following code snippet. class Vehicle { void run()	(2)

```
{
System.out.println("Vehicle is running");
} }
class Bike2 extends Vehicle
{
class void run()
{
System.out. println ("Bike is running safely");
}
public static void main(String args[])
{
Bike2 obj = new Bike2();
obj.run();
}
}
```

3A) Create a thread that reads a set of Student's Registration number, name, and OOPS subject marks into the file OOPFile.txt. Another thread reads the same student's Registration number and DS subject mark into the file, namely DSFile.txt. In main, read the content of both files and identify the students who have scored more than 80 in both subjects and display such names along with their details. (5)

3B) Write a multi-threaded program to do the following: (3)
a) Write thread writes 5 strings to a file - "Stringfile1.txt"
b) Read thread reads "Stringfile1.txt" and displays number of vowels and characters in each string.
c) The main thread should illustrate the working of above threads.

3C) Write the output and justify your answer. (2)

```
class A {
int[] a = new int[5];
A( ) {a[0] = 10;}
   }
  public class MainClass extends A
{ MainClass( )
     {a = new int[5];
System.out.println(a[0]);}

    public static void main(String[] args)
{ MainClass main = new MainClass();}
}
```

4A) Write a program which reads the integer value (in the range of 1-100). During the process of reading, if a user enters a value other than the range, then it will throw **IllegalArgumentException** exception. On the occurrence of such an exception, your program should print "You entered invalid range." If there is no such exception it will print the square root of the value. (5)

4B) Write a Java program with a class Cyclist having the information about cyclistID, name, and activityDuration in minutes. Create an array of Cyclist class objects, pass it to a method called void displayActivists(Cyclist[]) which prints the details of the longest activity in hours and minutes for each cyclist. (3)
Note: Consider a minimum of three cyclists for this program.

4C) What will be the output of the following program. Give reasons. (2)

```
class MyThread extends Thread
{
   MyThread()
   {
      System.out.print(" MyThread");
   }
   public void run()
   {
      System.out.print(" Running");
   }
   public void run(String s)
   {
      System.out.println(" Running "+s);
   }
}
public class Test
{
   public static void main (String [] args)
   {
      Thread t = new MyThread()
      {
         public void run()
         {
            System.out.println(" Walking");
         }
      };
      t.start();
   }
}
```

5A) Create a swing GUI based application to check the input string is palindrome or not. The GUI should have 3 textboxes and 2 buttons namely "Reverse String" and "Check for Palindrome. User is entering string input through textbox1. On clicking the "Reverse String" button, reverse of the inputted string should be displayed in textbox2. On clicking "Check for Palindrome", display the message "Palindrome" or "Not Palindrome" in textbox3, based on inputted string is palindrome or not. (5)

5B) Fill the missing only one line in method sum, which will return sum of individual digits in a number n. (3)

```
int sum(int n)

{

        int s=0;

        if(n>0)

        s =_____;

        return s;

}
```

5C) Write the output for a following code snippet. (2)

i) class prg1

```
 {  public static void main(String args[])
   {

          String s="abcabcabcabc";
          int pos = s.lastIndexOf('b',6);
          System.out.println(pos);

   }
 }
```

ii) class prg2

```
  {  public static void main(String args[])
     {   int a[] ={1,2,3,4,5,6,7,8,9,10};
         int y = a[a[7]/2];
         System.out.println(a[y]/2);
      }
   }
```

-----End-----