ICT 2155 OOP MAKE UP QP

1A. Discuss method overloading and overriding with suitable example for each. 5

1B. Give the uses of super and final keyword in Java with examples. 3

1C. Discuss various ways of creating and initializing 1D and 2D arrays, in Java with examples.2

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

2B. Create an interface "Employee_func" with data member DA and method computeSalary() to compute the salary of an employee. Create two classes namely Manager and Developer which use the computeSalary() method and display the salary. Criteria for computing the salary is given below:
For Manager: Gross Salary=Basic+40%DA.
Similarly for Developer: Gross Salary=Basic+10% DA.
Write a program to compute salary. Use appropriate constructors, variables and methods wherever necessary.3

2C. 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 =75 INR, 1 Euro =82 INR] 2

3A. Write a complete program to do the following:
i). Accept two strings S1 and S2. Find the common substrings from the two input strings.

Example:
S1: Java is new and vibrant
S2: World is full of new experiences.
Then two common substrings found are "is" and "new".

ii).If only one common substring is found then throw user defined exception, "OnlyOneSubstringFound". Print the exception with a message as "Exception Caught Only one substring Found" and it should print the S1 and S2 as it is.
Expected Output:
Exception Caught –Only one substring Found
S1 : Java was new and vibrant
S2: World is full of new experiences.

iii). If two common substrings are found, then replace the first substring in S2 by the user

entered string S3. Replace the second substring by its reversed form in S2.
Expected Output:-
If S3 is inputted with value “was” then,
S1 : Java is new and vibrant
S2: World was full of wen experiences 5

3B. Create a swing application which accepts two numbers and display the GCD and LCM of two numbers. 3

3C. Write a program to print Floyd’s triangle as below:

1

2 3

4 5 6

7 8 9 10

…….

79 .. .. ….. 91 2

4A. Write a java program to search an element in 3X3 matrix. The main thread should declare and initialize a 3X3 number matrix. Main thread should also take user input as the element to be searched in 3X3 matrix. Create three child threads “child1”, “child2” and “child3”. Each thread is responsible for searching elements in one of the rows of 3X3 matrix. The main thread should display the element position (row and column) by using the result from three child threads. Also print the priority of the main thread. (Use Runnable interface) 5

4B. Write a code snippet to check whether all vowels are present in a given string. If all vowels are present display the minimum number of characters compared in order to find all vowels.

Example: if input string is “"aeioxxxxaaaauxxxxx" then display message “characters compared 12” 3

4C. Write a program in java to demonstrate the savings bank account class. First determine class instance variables then methods. Define constructors to initialize instance data. The Account number should be generated by bank. Then write a main program to create an array of five account objects and illustrate normal account services such as withdraw and deposit.2

5A. Define a file called “f1.txt” containing ten records of class Covid, having fields related to vaccination details i.e state-name, district name, total population and total people vaccinated. Write a program to read these records and find total people vaccinated per state and percentage of vaccination. Write state-name and percentage of vaccination to another file called “f2.txt”.5

5B. Create a class Circle with radius as its private field. Create a subclass called cylinder with depth as its additional private field. Similarly create a class called rectangle and a subclass called cuboid with suitable private instance variables. Create an interface containing area and volume methods. Implement these in respective classes defined earlier. In main print area and volume of circle, cylinder, rectangle and cuboid.3

5C. Create a user defined exception InvalidRegistrationNumber.
Write a java program to check whether the entered registration number is valid or not.
If not throw an exception of type InvalidRegistrationNumber.
i.e 190911001 to 190911400
Ex: i/p regno =“190911050”
O/p valid registration number.
Ex: i/p regno =“170911050”
O/p invalid registration number : 170911050 2