Reg. No. : | | | | | | | | | | | | |

Question Paper Code: R4804

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Fourth Semester

Computer Science and Engineering

R21UIT404- JAVA PROGRAMMING

(Common to IT,CSD,CSE (AIML), CSE (SC) & CSE (CI)

(Regulations R2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1.	Develop a Java Program to find the factorial of a given number	CO2-App
2.	Implement a program to display the sum of two given numbers if the numbers are same. If the numbers are not same, display the double of the sum.	CO2-App
3.	Outline the purpose of 'this' keyword with example code	CO1-U
4.	Explain on Method with syntax and example	CO1 U
5.	Explain, why do we need super constructors?	CO1-U
6.	Outline on Blank Final Variable with a simple example code	CO1-U
7.	Compare Checked Exceptions and Unchecked Exception.	CO2-App
8.	Consider the following code snippet given below. What will be the output? Explain it.	CO2-App

```
import java.util.List;
import java.util.ArrayList;
public class ListTester {
        public static void main(String[] args) {
                List<String>nameList = new ArrayList<>();
                nameList.add(1,"One");
                nameList.add(2,"Two");
                for(String no:nameList){
                        System.out.println(no);
                }
        }
```

}

9. Develop a java Program using string constructor with input as ascii values and to display the output as shown below: CO2-App
ABCDEF
CDE

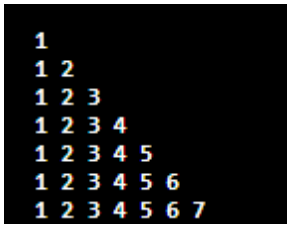
10. What is the output of the following code snippet? Explain it. CO2-App

```
public class Tester {
        public static void main(String args[]) {
                String input = "welcome to string functions";
                input.toUpperCase();
                System.out.println(input);
        }
}
```

PART – B (5 x 16= 80 Marks)

11. (a) (i)Implement a program to display the geometric sequence as given below for a given value n, where n is the number of elements in the sequence.1, 2, 4, 8, 16, 32, 64, ..., 1024 CO2-App (8)

(ii) Develop a JAVA program to print the following Number pattern CO2-App (8)



Or

(b) Implement a program to find the number of rabbits and chickens in a farm. Given the number of heads and legs of the chickens and rabbits in a farm, identify and display the number of chickens and rabbits in the farm. CO2-App (16)

If the given input cannot make a valid number of rabbits and chickens, then display an appropriate message.

Sample Input and Output

Sample Input	Expected Output
heads=150, legs=500	Chickens=50 Rabbits=100
heads=3, legs=11	The number of chickens and rabbits cannot be found

12. (a) Problem Description: ABC Confectionary is a chocolate manufacturer. Every chocolate which is manufactured will be with a default weight and cost. The cost and weight might be modified later based on business needs. CO2-App (16)

Create a class Chocolate, with a parameterized constructor and a default constructor. Also, use the "this" keyword while initializing member variables within the parameterized constructor.

Constructor Description:

- Chocolate(intbarCode, String name, double weight, double cost):

In the constructor initialize the member variables : barCode, name, weight, and cost, according to the table given below:

Attributes	Values
barCode	101
name	Cadbury
weight	12
cost	10

Or

(b) The Metro Bank provides various types of loans such as car loans, business loans and house loans to its account holders, i.e., customers. Implement a program to determine the eligible loan amount and the EMI that the bank can provide to its customers based on their salary and the loan type they expect to avail. CO2-App (16)

The values required for determining the eligible loan amount and the EMI

are:

- account number of the customer
- account balance of the customer
- salary of the customer
- loan type
- expected loan amount
- expected no. of EMIs

The following validations should be performed:

- The account number should be of 4 digits and its first digit should be 1
- The customer should have a minimum balance of $1000 in the account

- Display appropriate error messages if the validations fail.
- If the validations pass, determine whether the bank would provide the loan or not.

The following are the criteria for a bank to provide loan:

The bank would provide the loan, only if the loan amount and the number of EMIs expected by the customer is less than or equal to the loan amount and the number of EMIs decided by the bank respectively. The bank decides the eligible loan amount and the number of EMIs based on the below table:

Salary	Loan Type	Eligible Loan Amount	No. of EMIs
>25000	Car	500000	36
>50000	House	6000000	60
>75000	Business	7500000	84

- Display the account number, eligible and requested loan amount and the number of EMIs, if the bank provides the loan.
- Display an appropriate message if the bank does not provide the loan.

13. (a) Write a Java program that has a class Train with data members no of seats first tier, no of seats second tier, no of seats third tier and methods to set and display data. Derive a class Reservation that has data members seats booked first, seats booked second and seats booked third and methods to book and cancel tickets, and display the status. CO2-App (16)

Or

(b) Create a class Bike that has data members gear, speed and methods applyBrake() to decrease the speed to the given value and speedup() to increase the speed to the given value. Derive a class Mountain Bike from class Bike that has a data member seat Height and a method setHeight() to set the seatHeight to new value. Provide constructors to initialize the respective data members. Provide toString() to print the respective data members. From main() method, display the members of all the classes. CO2-App (16)

14. (a) Write a Java Code with its output as follows: CO2-App (16)

Create an array list and add the strings such as "C++,Java, C, python" and implement the following operations:

- Retrieve the string at index 2
- Change the string at index position 2 as "programming"
- Remove the string at index position 0

Or

(b) Develop a java program with package and interface to calculate the area and perimeter of Circle, Rectangle and Ellipse with the following input : CO2-App (16)

- Create a package with name MyInterface
- Interface with name GeoAnalyzer with variables pi,area and perimeter
- Create classes Circle, Ellipse and Rectangle
- Create a Main class as shape

15. (a) Complete the reverseEachWord() method given in the Tester class. CO2-App (16)

Method Description

reverseEachWord(String str)

Reverse each word in the string passed to the method without changing the order of the words and return the modified string.

Test the functionalities using the main() method of the Tester class.

Sample Input	Expected Output
all cows eat grass	lla swoc tae ssarg
I love programming	I evol gnimmargorp

```
class Tester
{
   public static String reverseEachWord(String str)
      {
 //Implement your code here and change the return value accordingly
       return null;
      }
      public static void main(String args[])
{
         String str = "all cows eat grass";
      System.out.println(reverseEachWord(str));
      }
}
```

Or

(b) Develop the java code for the following method description: CO2-App (16)

Method description

checkpalindrome(String str)

- Check whether the string passed to the method is palindrome or not
- Return true if the string is palindrome or not

Test the functionalities using main() method of the tester class

Sample Input and Output

Sample Input	Expected Output
radar	true
apple	false