END SEMESTER EXAMINATION, MARCH-2023

INTRODUCTION TO COMPUTER PROGRAMMING
(CSE 1001)

Programme: B.Tech **Semester: Ist**
Full Marks: 60 **Time: 3 Hours**

Subject/Course Learning Outcome	*Taxonomy Level	Ques. Nos.	Marks
Ability to state and explain the basic Java programming syntax, semantics, and building blocks.	L1	2(b,c), 3(a,b,c), 5(b,c)	14
Ability to design, write, debug, and test the correctness of programs.	L3	1(a,b,c), 2(a)	8
Ability to develop Java programs using programming constructs like conditional statements, looping, arrays, methods, and class.	L2, L3	8(a,b,c), 9(a,b,c) 10(b)	14
Ability to solve computational problem(s) using programming constructs.	L4	4(a,b,c), 5(a), 10(c)	10
Ability to identify the problem, and identify a solution plan for the problem.	L3, L4	6(a,b,c)	6
Ability to analyze the problem, and improve the efficiency of the solution.	L4	7(a,b,c), 10(a)	8

Bloom's taxonomy levels: Remembering (L1), Understanding (L2), Applying (L3), Analysing (L4), Evaluating (L5), Creating (L6)

Answer all questions. Each question carries equal mark.

1. (a) Find the output of the given code snippet. 2

```
byte y=15,z=(byte) ~y;
System.out.println(~y);
System.out.println(~z);
y&= ~y;
System.out.println(y>>2);
byte x = -11;
System.out.println(x>>>28);
```

(b) Find the output of the given code snippet. 2

```
int i = 140;
short s = 23;
byte b = (byte) i;
int x = b + s;
System.out.println("Value of x is " + x);
x=x%2-20;
System.out.println("New value of x is "+x);
```

(c) Find the output of the given code snippet. 2

```
int x=4,y=-8;
if(++x<(y=y-=7)||(x=x+=14)>y){
      System.out.println(x+","+y);
}else{
      System.out.println((x-y)+","+(y-x));
}
```

2. (a) Find the output of the given code snippet. 2

```
int a[]=new int[5];
int sum=0;
for(int i=0;i<a.length;i++){
      a[i]=a[i]+i*2;
      sum=sum+a[i];
      System.out.println(a[i]);
}System.out.println(sum);
```

(b) Amit and ruby are playing with dice. In one turn both of them rolling the dice once. They consider a turn to be good if sum of their number on the dice is greater than 6. Given that a particular turn got X and Y on their respective dice. Find whether the turn was good. Write a java program for the given problem. 2

(c) Write the java statements that take three integer value from command line and print them in ascending order. Use Math.min() and Math.max(). 2

3. (a) Write the Java statements that takes the x-y co-ordinates of a point in the Cartesian plane and print a message telling either on axis the point lies or the quadrant on which it is found. 2

(b) Tom is running after jerry. Jerry is running at a speed of X meter per second while Tom is chasing him at a speed of Y meter per second. Determine whether Tom will able to catch Jerry. Note that initially Jerry is not at the same position as TOM. Write a Java program for the given problem. 2

Constraint 1<=(X,Y)<=100

E.g: Jerry speed=4, Tom speed=1, so can't catch

Jerry speed=3, Tom speed=5, so can catch

(c) Write a java program that prompts the user to enter an integer for today's day of the week (Sunday is 0, Monday is 1... and Saturday is 6). Also prompt the user to enter the number of days after today for a future day and display the future day of the week. 2

4. (a) If "HOUSE" is coded as 35842, and "LEMON" is coded as 12659, then what would be the code for "HELEN"? Write the java statements for the above problem. 2

(b) An integer n is divisible by 9 if the sum pf its digits is divisible by 9. Use this concept in your program to determine whether or not the number n is divisible by 9. 2

(c) Write a program that will read the value of n from the user and calculate sum of the following series: 2
$(1/1^2)+(1/2^2)+(1/3^2)+....+(1/n^2)$

5. (a) Write the java statements to find the difference between the sum of the squares of the first 10 natural numbers and the square of the sum. 2
Difference = $(1^2 + 2^2 + ...+10^2) - (1 + 2 + ...+10)^2$

(b) Draw a flow diagram for the given Question no. 5(a) 2

(c) Write the execution pattern for the given Question no. 5(a). 2

6. (a) Write a Java method to count the number of occurrences of a specified character in a string. The method signature is as follows: 2
public static int count(String str ,char c)

(b) Write a java method to check whether a password contains at least two digit and must have at least 8 characters. If it satisfies the conditions then return "Valid Password" otherwise return "Invalid Password". The method signature is as follows: 2
public static String validatePassword(String str)

(c) You are given N fruits. The weight of the fruits is represented by an array A. All those fruits which have the same weight can be sliced in one step. Your task is to determine the number of steps to slice all the fruits. Write the java statements for the given problem. 2
e.g: N=6, A={20,40,30,50,40,20}
1st slice=20, 2nd slice=40, 3rd slice=30, 4th slice= 50
So number of slice=4.

7. (a) Write the Java statements to find the GCD of two number. 2

(b) WAP to enter the first number and second number. Display the prime numbers between the first and second number. 2

(c) Write the java statements to print the given pattern. 2

```
5
4 4
3 3 3
2 2 2 2
1 1 1 1 1
0 0 0 0 0 0
```

8. (a) Write a Java method to calculate the sum of digits of a given number until the number is a single digit. 2
e.g: Let n=9294, sum=9+2+9+4=24, sum=2+4=6 so, result is 6.
The method signature is as follows:
public static int sum_Of_Digit(int n)

(b) Write the Java method to check whether a number n is a Neon number or not. e.g: Let n=9, $(9)^2$ =81 , 8+1=9, which is equals to n, so 9 is a Neon Number. The method signature is as follows: 2
public static boolean checkNeon(int n)

(c) Write a Java method to check whether a number n is a spy number or not. e.g Let n=132, sum=1+3+2=6, product=1*3*2=6, sum==product, so 132 is a spy number. Use single loops. The method signature is a s follows: 2
public static Boolean checkSpy(int n)

9. (a) Write the java statements to insert an element at specified position of an array. 2

(b) Write a java method to search an element present in the array using linear search. The method signature is as follows. 2
public static Boolean linearSearch(int array[],int element)

(c) Write a java method to find the smallest element present in the array. The method signature is as follows: 2
public static double min(double array[])

10 (a) Write a Java program to read a string and print true if the string is a palindrome otherwise print false. 2
e.g: if string s is "MADAM" print true
e.g: if string s is "MAD" print false

(b) Write a java program to overload the method area() to find area of a circle, rectangle and square. 2

(c) Write a Java method that returns the number of days in a year. The method signature is as follows: 2
public static int numberOfDaysInAYear(int year)

End of Questions