



COMSATS UNIVERSITY ISLAMABAD, ISLAMABAD CAMPUS

DEPARTMENT OF COMPUTER SCIENCE

Mid-Term Examination, SPRING 2022

Class:	BSCS2(A&B), BSSE2(A&B), BDS-2A, BAI-2A, BCT-2A	Marks:	50
Subject:	CSC103 Programming Fundamentals	Time:	90min

Student Name	Momina Amjad	Class	BCS-2A
Reg#	FA21-BCS-041	Section	A

Instructions:

1. Attempt all questions.
2. Solve all questions on question paper.
3. Don't try to write unnecessary details, it will be considered as negative point.
4. Mobile phones or digital devices are not allowed.

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Question-1: Write output of the following pieces of code

(6 x 2 Marks) – CLO 1

<pre> public class Test { public static void main(String[] args) { int count; for (count = 1; count <= 10; count++) { if (count == 5) System.out.printf("%d ", count); } System.out.printf("\nBroke out of loop at count = %d\n", count); } } </pre>	<pre> public class Test { public static void main(String[] args) { int num1= 1; int num2= 2; int num3= ++num1 + num1 + num2; System.out.println(num3); System.out.println(++num2); System.out.println(++num2); System.out.println(num3++); } } </pre>	<pre> public class Test { public static void main(String[] args) { for(int i=0; i<5;i--) System.out.println(""); } } </pre>
<p>Output:</p> <p>5 Broke out of loop at count = 10</p>	<p>Output:</p> <p>5 3 4 2</p>	<p>Output:</p> <p>* * * : infinite loop</p>
<pre> public class Test { public static void main(String[] args) { int i, j, row = 5; for (i=0; i<row; i++) { for (j=row-i; j>1; j--) System.out.print(" "); for (j=0; j<=i; j++) System.out.print("****"); System.out.println(); } } } </pre>	<pre> public class Test { public static void main(String[] args) { String s1 = "TAT"; String s2 = "BAT"; String s3 = new String("RAT"); String s4 = new String("CAT"); s2=s4; s4=s3; s1=s3=s4; System.out.println(s1); System.out.println(s2); System.out.println(s3); System.out.println(s4); } } </pre>	<pre> public class Test { static int testMethod(int a) { int x=10; if(x % 2 == 0) System.out.println(x + " is even"); else System.out.println(x + " is odd"); return x; } public static void main(String[] args) { int s= testMethod(12); System.out.println("s =" + s); } } </pre>
<p>Output:</p> <pre> -- -- -- * * - - - * * * * - - * * * * * - * * * * * * * * * * * * * </pre>	<p>Output:</p> <p>RAT CAT RAT RAT</p>	<p>Output:</p> <p>10 is even s= 10</p>

Question-2: Write code snippets for the following statements

(1+1 Marks) – CLO 2

- a) Find largest number among three numbers using conditional operator

```
max = a;  
if (max < b) { max = b; }  
if (max < c) { max = c; }
```

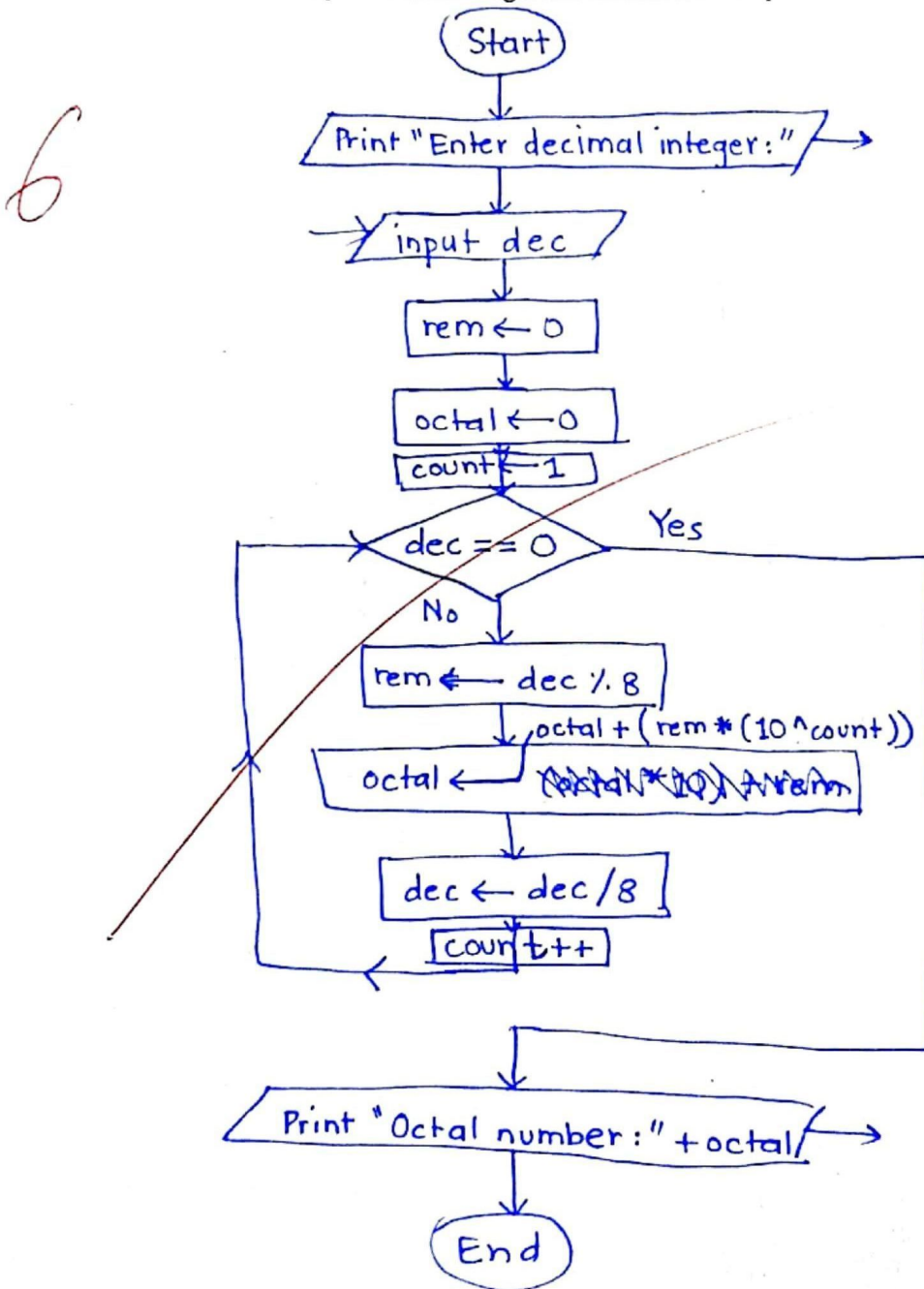
- b) Write the method header for a Method named as Method intToFloat, which takes integer argument number and returns a float.

```
public static float intToFloat (int number)
```

Question – 3 (CLO-1)

6 Marks

Draw a flowchart to accept a decimal integer and convert it into equivalent octal number.



Question - 4 (CLO-2)

10 Marks

Prime number is a whole number having only two factors. You are required to write a method to accept an integer and return true if the given number is prime else return false.

Use the above defined method in the following program.

Write a Java program to keep accepting integer values from user until a prime number is entered.

```
(10) import java.util.Scanner;
public class PrimeNumber{
    public static boolean prime (int n){
        for (int i=2; i<=n/2; i++){
            if (n%i==0)
                return false;
        }
        return true;
    }
    public static void main (String[] args){
        Scanner input = new Scanner(System.in);
        int num;
        boolean check = false;
        while (!check){
            num = input.nextInt();
            check = prime(num);
        }
    }
}
```

Question - 5 (CLO-2)

10 Marks

A perfect number is a number for which the sum of its divisors is exactly equal to the number. For example, the sum of the divisors of 28 would be $1 + 2 + 4 + 7 + 14 = 28$, which means that 28 is a perfect number.

Write a Java program that asks user to input a number and then prints whether user has entered a perfect number or not.

```
import java.util.Scanner;
public class Perfect{
    public static void main (String [] args){
        Scanner input = new Scanner (System.in);
        System.out.print ("Enter a number:");
        int n = input.nextInt();
        int sum = 0;
        for (int i = 0; i < n; i++){
            if (n % i == 0)
                sum = sum + i;
        }
        if (sum == n)
            System.out.println ("Number " + n + " is perfect number");
        else
            System.out.println ("Number " + n + " is not a perfect number");
    }
}
```

Write a Java program to accept a line of string from user. You are required to:

- Find number of vowels in the given string
- Check whether the string contains your first name or not.
- Find number of characters in the given string
- Divide the string in two equal parts. For example if the given string is "COMSATS University Islamabad - Pakistan"
Then string1 becomes "COMSATS University"
and string2 becomes "Islamabad - Pakistan"
- Display "Invalid Input" if no string is entered.

```

import java.util.Scanner;
public class Test {
    public static void main (String[] args) {
        Scanner input = new Scanner (System.in);
        String str = input.nextLine();
        if (str.length() != 0) { // Part E
            int vowels = 0; // Part A
            char ch;
            for (int i=0; i<str.length(); i++) {
                ch = str.charAt(i);
                if ((ch=='a') || (ch=='e') || (ch=='i') || (ch=='o') || (ch=='u') || (ch=='A')
                    || (ch=='E') || (ch=='I') || (ch=='O') || (ch=='U')) {
                    vowels++;
                }
            }
            System.out.println ("Number of vowels: " + vowels);
            // Part C
            String characters = str.trim();
            System.out.println ("Number of characters: " + (characters.length()+1));
            // Part D
            int len = str.length() / 2;
            String sub1 = str str.substring (0, len);
            String sub2 = str.substring (len);
            System.out.println ("First half: " + sub1);
            System.out.println ("Second half: " + sub2);
            // Part B
            String name = "Momina";
            int check = str.indexOf (name);
            if (check == -1)
                System.out.println ("String does not have name");
            else
                System.out.println ("String has name");
        }
    }
}

```

cont. 