



COMSATS UNIVERSITY ISLAMABAD, ISLAMABAD CAMPUS
DEPARTMENT OF COMPUTER SCIENCE
Mid-Term Examination, FALL 2022

Class:	BSCS, BSSE, BDS, BAI, BCT	Marks:	25
Subject:	CSC103-Programming Fundamentals	Time:	90min
Instructors:	Dr. Manzoor Iqbal Tamimy, Dr. Hafsa Mohsin, Mr. Umar Iqbal, Mr. Rizwan Rashid	Dated:	Nov 17, 2022

Instructions:

1. Attempt all questions.
2. Mobile phones or digital devices are not allowed.
3. **Return question paper along with answer sheet.**

Question-1: Write code snippets for the following statements. [CLO-2] (1 x 5 Marks)

- a) Write a Java **while** header that allows processing the loop body instructions as long as the value in the **quantity** variable is greater than the number 0.
- b) Write a Java **while** header that stops the loop when the value in the **quantity** variable is less than the number 0.
- c) Write a Java **while** header that allows processing the loop body instructions as long as the value in **char** variable named **letter** is either Y or y.
- d) Write a Java **while** header, with an appropriate sentinel value, for a program that inputs the number of **hours** each employee worked during the week.
- e) Write a Java **for** header that allows processing the loop instructions as long as the **x** variable's value is less than or equal to the number 100. It initializes **x** with 10 and steps it up by 10.

Question-2: For a given code snippet, draw a diagram of method call stack for execution. [CLO-2] (2 Marks)

```
public class CallStack{
    public static void main(String[] args){
        int x = 2, y = 3;
        methodA(x,y);
    }
    public static void methodA(int a, int b){
        int ans = methodB(a,b);
    }
    public static int methodB(int a, int b){
        return a+b;
    }
}
```

Question - 3 [CLO-2] 3 Marks

A sequence consists of integer numbers and ends with the number 0. Determine three highest numbers in the sequence. Do Not Use Arrays.

Sample Run

Input: 3 5 1 8 9 5 6 50 43 0

Output: Three highest Numbers: 50 > 43 > 9

Student name & reg. no. : _____

Question -4 [CLO-2]

5 Marks

Write a program with a method that accepts a string as an argument and returns the number of vowels that the string contains. The application should have another method that accepts a string as an argument and returns the number of consonants that the string contains. The application should let the user enter a string and should display the number of vowels and the number of consonants it contains.

Question -5 [CLO-2]

5 Marks

Given an odd positive integer n draw the following pattern.

```
*       *       *
 *     *     *
  *   *   *
 * * * * *
 * * *
  * * *
 *   *   *
*       *       *
```

Question - 6 [CLO-1]

5 Marks

Many private water wells produce only 1 or 2 gallons of water per minute. One way to avoid running out of water with these low-yield wells is to use a holding tank. A family of 4 will use about 250 gallons of water per day. However, there is a "natural" water holding tank in the casing (i.e., the hole) of the well itself. The deeper the well, the more water that will be stored that can be pumped out for household use. But how much water will be available?

Write a program that allows the user to input the radius of the well casing in inches (a typical well will have a 3-inch radius) and the depth of the well in feet (assume water will fill this entire depth, although in practice that will not be true since the static water level will generally be 50 feet or more below the ground surface). The program should output the number of gallons stored in the well casing.

The volume of a cylinder is $\pi r^2 h$ and 1 cubic foot = 7.48 gallons of water.