Vavuniya Campus of the University of Jaffna

First Examination in Information and

Communication Technology - 2017

First Semester - September/October 2018

ICT1172 Practical for Object Oriented Program Design

Answer All Questions

Time Allowed : **Three** hours

Instructions:

Create a folder on the desktop with your **INDEX NUMBER** as the **FOLDER NAME**.
Save all your files in this folder.

1. (a) Write a program in Java to perform each of the following tasks:

    i. Read ten integers and store them in an array.

    ii. Find the maximum and minimum values of the array elements.

    iii. Find the sum and average of the array elements.   [20%]

    (b) Write a Java program to create and display all the possible four-digit integers
    that can be made from the digits 1 to 7 *(one digit can occur only once in
    an integer created)*. Count the number of created such integers.   [10%]

2. (a) Implement a Java class **Author** with the following properties: [20%]

    i. Instance Variables (**Private**):

        • name: String

        • email: String

        • gender: char

    ii. A constructor to initialize the Instance Variables *name, email* and *gender* with given values.

    iii. Methods (**Public**):

        • Getters for the Instance Variables *name, email* and *gender*.

        • Setter for the Instance Variable *email.*

        • A **toString()** method that returns the details of an author.

(b) Implement a Java class **Book** with the following properties: [20%]

    i. Instance Variables (**Private**):

        • name: String

        • author: Author

        • price: double

        • quantity: int

    ii. Constructors:

        • A constructor to initialize the instance variables *name, author* and *price* with given values and the instance variables quantity with the default value 0.

        • Another constructor to initialize all the instance variables with given values.

    iii. Methods (**Public**):

        • Getters for all the instance variables.

        • Setters for the instance variables *price* and *quantity*.

        • A **toString()** method that returns the details of a book.

(c) Consider the following details of books:

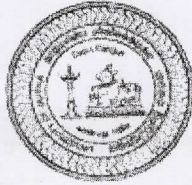| Name of the Book	Author Name	Author email	Author Gender	Price	Qty
Head First Java	Kathy Sierra	kathysierra @gmail.com	M	5360.00	5
Java: An Introduction to Problem Solving	Walter Savitch	waltersavitch @gmail.com	M	4300.00	0
Java: A Beginner's Guide	Herbert Schildt	herbertschildt @yahoo.com	M	3874.00	8
Core Java	Cay S. Horstmann	cayhorstmann @live.com	F	3874.00	5
Core Java SE 9	Cay S. Horstmann	cayhorstmann @live.com	F	5170.00	10
OCA/OCP Java SE 7	Kathy Sierra	kathysierra @gmail.com	M	4330.00	0
Spring in Action	Craig Walls	craigwalls @yahoo.com	M	5440.00	6
Java: Basic for Beginners	MG Martin	martin @gmail.com	M	980.00	4
Intro to Java Programming	Y. Daniel Liang	danielliang @live.com	M	2500.00	3
Java: Programming Basics	Nathan Clark	nathanclark @gmil.com	F	500.00	7

[This question is continued on the next page]

Implement a Java class **BookArray** with the following functionalities: [30%]

i. Create the objects of Books and Authors with the above details.

ii. Create an array of books to store the objects of books.

iii. Write a code block to check the availability and to display the details of books based on the book name and quantity as below. (**Read inputs from the user**).

Input 1: Name of the book	Input2: Quantity	Expected Output
OCA/OCP Java SE 7	5	Out of Stock!
Java: Basic for Beginners	4	Available! Book Details Book Name: Java: Basic for Beginners Author Name: MG Martin E-mail: martin@gmail.com Gender: M Price: 980.00
Core Java	7	Requested number of books are not available. Only 5 books available at the moment! Book Details Book Name: Core Java Author Name: Cay S.Horstmann E-mail: cayhorstmann@live.com Gender: F Price: 3874.00

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Second Examination in Information and Communication Technology - 2017

First Semester - September/October 2018

ICT2172 Practical for Visual Computing (Rapid Application Development)

Answer All Questions

Time Allowed : Three hours

Instructions

- *The Image related to the questions are saved in the Desktop folder named ICT2172_Final and Save all your files in a Desktop folder named with your index number (E.g.: IT11005).*

1. Suppose that, you are selected as a System Developer to the Vavuniya Campus of the University of Jaffna, you are required to develop a Staff Management System for the Campus. Staff are categorized into Academics and Non-Academics in Sri Lankan University System. The allowances for the both categories are paid as a percentage of the basic salary. The details are given below:

   - Academic Staff:
     - Academic Allowance - 70%
     - Research Allowance - 15%
   - Non-Academic Staff:
     - Monthly Compensatory Allowance (MCA) - 25%

   In addition, the Cost of Living allowance(fixed- Rs 7800/=) and special allowance (15% of the basic salary) are paid to all of them. Write a class(es) to calculate the allowances given above along with appropriate methods and generate a .dll file named as "SalaryLibrary.dll". [30%]

1

2. There are three interfaces to handle the employee details of the Campus. Develop Graphical User Interfaces (GUIs) using Visual Studio IDE to manipulate the employee details of the Campus as described below:

(a) **Employee Details**: It contains personal details and salary details of the Staff (Figure 1).

- After giving the basic salary as an input, calculate the allowances using the .dll file generated in question 1 when the user click "Calculate" button.

- Validate the basic salary in such a way that consists of only numbers by giving an error message using the error provider as shown in Figure 2.

- The "Calculate" button will be invisible as shown in Figure 2 if the input is not a number.

- The **Educational Details** interface will be appeared by making the **Employee Details** interface invisible when the user clicked "Educational Details" button.

Figure 1: Employee Details

Figure 2: Error Message

(b) **Educational Details**: It contains educational details of the staff (Figure 3).

- The previous Employee Details interface will be appeared back by making the **Educational Details** interface invisible when the user click the "Employee Details" button.

- The **Final Report** will be displayed when the user click the "Final Report" button.

[25%]

3

Figure 3: Educational Details

(c) **Final Report**: The details given in both Employee Details and Educational Details are displayed in a summarized manner as shown in Figure 04.

Figure 4: Final Report

[5%