|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **National University of Computer and Emerging Sciences, Lahore Campus** | | | | |
| C:\Users\saif\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\final design.jpg | **Course Name:** | **Introduction to Computing** | **Course Code:** | **EE116** |
| **Program:** | **BS(Electrical Engineering)** | **Semester:** | **Spring 2020** |
| **Duration:** | **3hrs** | **Total Marks:** | **100** |
| **Paper Date:** | **26-JUNE-20** | **Weight** | **50%** |
| **Section:** | **All** | **Page(s):** | **2** |
| **Exam Type:** | **FINAL EXAM** |  |  |
| **Student : Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Roll No.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Section:\_\_\_\_\_\_\_** | | | | |
| **Instruction/Notes:** | **Exam is open book and open notes.**  **Cheating/plagiarism is strictly prohibited.** | | | |

**Q.1** **[CLO 02] [10][15] marks**

a) Joy bought land to make a farm house and sell diary items and meat. Suppose that Joy wants to keep a maximum of two types of animals. Write a program that prompts Joy or the user to do the following:

1. Enter the total farm house area

2. The number of animals (one or two) that the user wants to keep.

3. If the user wants to keep two types of animals, then specify the portion, as a percentage of the farm land used for each types of animals.

4. Enter the labor-cost and feeding cost for each acre

5. Enter animals selling price per acre

6. Output the profit

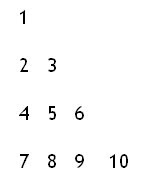
7. Output the loss

b) The cost of renting a car at a “RENT A CAR” company is, say $200.00 per night. For special occasions, such as a wedding, the company offers a special discount as follows: If the number of cars booked is at least 10, the discount is 10%; at least 20, the discount is 20%; and at least 30, the discount is 30%. Also, if cars are booked for at least 3 days, then there is an additional 5% discount. Write a program that prompts the user to enter the cost of renting one car, the number of cars booked, the number of days the cars are booked. The program outputs the cost of renting one car, the discount on each car as a percent, the number of cars booked, the number of days the cars are booked and the total cost of the cars. Your program must use appropriate named constants to store special values such as various discounts.

**Q.2 [CLO 03] [10] [15] marks**

a) Write a program that prompts the user to input an integer and then outputs both the individual digits of the number and the sum of digits, for example the input is :3456, the outputs are 3 4 5 6 and sum=18

b) Write a program to print 1-10 Numbers in Pyramid fashion as shown in fig. below:

****

**Q.3** [**CLO 04] ` [25 marks]**

Write a program that uses a two-dimensional array to store the highest and lowest temperatures for each month of the year. The program should output the average high, average low, and the highest and lowest temperatures for the year.

Your program must consist of the following functions:

a. Function getData: This function reads and stores data in the two-dimensional array.

b. Function averageHigh: This function calculates and returns the average high temperature for the year.

c. Function averageLow: This function calculates and returns the average low temperature for the year.

d. Function indexHighTemp: This function returns the index of the highest high temperature in the array.

e. Function indexLowTemp: This function returns the index of the lowest low temperature in the array. (These functions must all have the appropriate parameters.)

**Q.4** [**CLO 05] ` [25 marks]**

Write a program that can be used to calculate the federal tax. The tax is calculated as follows: For single people, the standard exemption is $4,000; for married people, the standard exemption is $7,000. A person can also put up to 6% of his or her gross income in a pension plan. The tax rates are as follows: If the taxable income is:

1. Between $0 and $15,000, the ta\.x rate is 15%.

2. Between $15,001 and $40,000, the tax is $2,250 plus 25% of the taxable income over $15,000.

3. Over $40,000, the tax is $8,460 plus 35% of the taxable income over $40,000.

Prompt the user to enter the following information:

1. Marital status

2. If the marital status is "married," ask for the number of children under the age of 14

3. Gross salary (If the marital status is "married" and both spouses have income, enter the combined salary.)

4. Percentage of gross income contributed to a pension fund.

Your program must consist of at least the following functions:

a. Function getData: This function asks the user to enter the relevant data.

b. Function taxAmount: This function computes and returns the tax owed.

To calculate the taxable income, subtract the sum of the standard exemption, the amount contributed to a pension plan, and the personal exemption, which is $1,500 per person. (Note that if a married couple has two children under the age of 14, then the personal exemption is $1,500 \* 4 = $6,000.)