STUDENT ID: 00152

IP ADDRESS :.....

MACHINE NUMBER :.....

Sri Lanka Institute of Information Technology

B. Sc. Honours Degree/ Diploma
in
Information Technology

Final Examination
Year 1, Semester 1 - 2018

IT1010 - Introduction to Programming
Paper 1A

Duration: 3 Hours

Instructions to Candidates

- This paper has **four** questions. Attempt all four questions.
- Total marks is 100.
- You need to save your programs with the given file name. First check the file name and use the vi editor to create the file.
- Do not create any folders in your login.
- Include your IT number in all your programs.
- DO NOT TAKE THE PAPER FROM THE EXAMINATION HALL.

Question 1 **20 Marks**

ABC higher education institute offers three courses in this academic year. The courses and their registration fees are given in the following table.

Course Type	Course Name	Registration Fee (Rs.)
H	Diploma in Hospitality Management	1500.00
M	Diploma in Marketing	2000.00
F	Diploma in Finance	2500.00

Only hundred students will be registered for all three courses within one academic year. The registration for all three courses will be held on the same day first come first serve basis.

Write a C program to register students for the above courses by entering their course type from the keyboard. The program should accept both uppercase and lowercase letters as correct inputs for course type. Your program should display the number of students registered for each course and the total registration fee earned from each course. When the course type is invalid, program should display an error message.

The program should terminate the registration process when the total number of registrations becomes 100 or there are no more registration to be done.

Save your program as 1AJune1.c

Question 2 **30 Marks**

PART A

An array stores the details of customer transactions (account number, name, transaction type (w-withdrawals, d – deposits) and amount) in a bank. Write a C program to create such an array and store the details of five customer transactions. Using the stored details, calculate the following.

a) Total deposit amount.
b) Total withdrawal amount.
c) Name of the customer who has deposited the maximum amount.
d) Name of the customer who has withdrawn the minimum amount.

Use a structure to create your array. Use suitable data types for members of the structure.

Sample input

8254	1267	7823	9023	4587
Viraj	Sudesh	Ama	Danuli	Hiran
D	D	W	w	D
500.00	1000.00	350.00	250.00	750.00

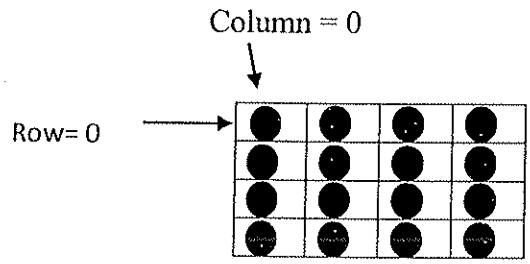
Sample output

Total deposit amount : 2250.00
Total withdrawal amount : 600.00
Name of the customer with the maximum deposit amount: Sudesh
Name of the customer with the minimum withdraw amount : Danuli

Save your program as 1AJune2a.c

PART B

A 4 x 4 square display panel consists of LED bulbs of red, green and blue colours. Write a C program to create a character array to represent the LED panel as shown below.



Enter the color of the LED bulbs ('R', 'G' or 'B') of the panel from the keyboard. Display the colours of the LED display.
Go through the array and display the position (row and column) of the "Red" bulbs.

Sample output is given below
R R G B
G G G B
R G B B
B B B G

Red LED bulb positions
[0,0] [0,1] [2,0]

Save your program as Save your program as 1AJune2b.c

Question 3 **30 Marks**

The "On the Go" family super market is giving discounts for their customers who shop between 16:00 to 22:00 hrs. The discounts are given according to the time and the amount they spend at the shop. The discount percentages are shown in the following table.

Time (24 Hrs)	Total amount > =5000	5000 >Total amount >= 2500
16:00 to 19:00	10%	7%
20:00 to 22:00	12%	9%

a) Write a function called `calDiscount( )` to calculate the discount given for a transaction by sending the time as and integer (eg : between 16:00 to 16:59 enter only 16) and the total amount as parameters.

```
float calDiscount (int time, float totAmount)
```

b) Write a function called `testCalDiscount( )` which contains two assert statements to debug the above implemented function.

The supermarket has also decided to give a free gift for the customers according to the amount after deducting the discount. The table below shows the criteria for the gifts.

Final Amount(after discount)	Gift
>=7,000	Packet of Milk
5000 – 6999	1 kg of Sugar
3000 - 4999	Pack of 6 Eggs

c) Write a function called `displayGift( )` to display the gifts obtained by each customer.

```
void displayGift(float finalTot)
```

d) In your main program do the following :
   i. Call the `testCalDiscount( )` function.
   ii. Input the time and the total amount from keyboard. If the user enters an invalid time then display an error message. Display the final amount(after discount) and the gift obtained using the two functions implemented in part a) and part c).

Save your program as 1AJune3.c

Question 4 **20 Marks**

A company uses a text file to maintain their employee attendance. For each employee the following details will be added to the file.

Employee Number (string)
Name (string)
Attendance status (boolean) – 0 for absent and 1 for present

a) Write a C program to input the attendance of **two employees for 7 days** from keyboard and save them in a file called "attendance.dat"

```
111    Perera  1011011
112    Silva   1011000
```

Save your program as 1AJune4a.c

b) Write a C program to input an employee number from the keyboard and display the total number of days that employee reported to work according to "attendance.dat" file.

Save your program as 1AJune4b.c

Grading Sheet

Question 1

Compile correctly	1.0
Execute correctly	
- Inputs	0.5
- Outputs	2.0
Correct use of repetition	4.0
Correct processing	
- Use of selection	3.0
- Correct calculation	4.0
Display error message	1.0
Display the outputs	2.0
Formatting the output	0.5
Coding conventions	2.0

Question 2

Compile correctly	1.0
Execute correctly	
- 1D array inputs	0.5
- 1D array outputs	2.0
- 2D array display array	2.0
- 2D array display positions	2.0
1D array	
- Define a structure	2.0
- Create array	1.0
- Input data	2.0
- Perform calculations	4.0
- Display output	2.0
2D array	
- Define array	0.5
- Input values	1.0
- Display array	2.0
- Find positions	3.0
- Display positions	3.0
Coding conventions	2.0

Question 3

Compile correctly	1.0
Execute correctly	
- Inputs	0.5
- Outputs	2.0
Implement function 1	5.5

Implement function 2	5.0
Implement test function	6.0
In main program	
- Take inputs	1.0
- Call functions in correct order	6.0
- Display output	1.0
Coding conventions	2.0

Question 4

Compile correctly	1.0
Executes correctly	
-write data	2.0
-correct outputs	2.0
File writing	
- Open file for writing	0.5
- Read values from the key board	2.0
- Write data to the file	2.0
- Handle multiple records	1.0
File reading	
- Open the file for reading	0.5
- Read the data from the file	4.0
- Calculation	1.0
- Handle multiple records	1.0
- Display output	1.0
Coding conventions	2.0