STUDENT ID:.....

IP ADDRESS :.....

MACHINE NUMBER :.....

Sri Lanka Institute of Information Technology

B. Sc. Special Honours Degree/ Diploma
in
Information Technology

Repeat Examination – June Intake
Year 1, Semester 1 (2016)

IT101 - Introduction to Programming Environments (UNIX / C++)

Duration: 3 Hours

Instructions to Candidates

- This paper has **Four** questions.
- Total Marks is 100.
- You need to save your programs with the given file name. So 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 01 **(25 Marks)**

Write C++ program to calculate the marks scored by a students for a particular module. The module has 3 types of exams: 4 assignments, 2 practical exams and a final theory exam.

a) Implement a function to calculate the total marks of the assignments. The function should accept all 4 assignment marks as parameters and provides the total assignment mark as the output.

```
int calculateAssignmentMarks(int marks1, int marks2, int
marks3, int marks4);
```

b) Implement a function to calculate the total marks of the practical exams. The function accepts both exam marks as parameters and provides the total practical exam marks as the output.

```
int calculatePracticalMarks(int prac1, int prac2);
```

c) Implement a function to calculate the final marks scored for the module. The function accepts marks of assignments, practical exams and the theory exam as parameters and provides the final mark of the module as the output.

```
float calculateFinalMarks(int assignment,  int practical,
int theory);
```

Total marks = 20% of assignment marks + 30% of practical test marks + 50% of the theory exam marks

d) Implement a function to find out the grades obtained by the student based on the final mark they have scored.

```
char getGrade(float finalmarks);
```

The final grade is computed as follows:

Final Marks	Grade
85 or Above 85	A
75 or Above 75	B
65 or Above 65	C
Below 65	X

e) Implement a function to print the details of the student.

```
void printStudent(char name[], int id, float finalMarks,
char grade);
```

f) In the main program,

i) Allow the user to enter the name, student id, marks of all components described above.

Note:

- If the student is absent for a particular exam, it should be taken as the marks is zero
- Marks are entered out of 100.

ii) Call the appropriate functions in the correct order to calculate the final marks.

iii) Display the Student name, id and final marks along with the grade obtained using the printStudent() function.

Sample Output:

```
Enter Name: Anne
Enter ID: 1234
Enter all 4 assignment marks: 70   80   90   20
Enter both practical exam marks: 70   85
Enter theory exam marks: 90

Name: Anne
ID: 1234
Final Marks: 81.25
Grade: B
```

Save your program as ***blue4.cpp***

Question 02 **(25 Marks)**

Write a C++ program to store the names of students and marks obtained for 5 subjects in a text file.

a) Create a text file called "marks.txt" and store the following data.

Amali	56	89	45	78	32
Kumari	89	53	48	92	73
Saman	71	56	42	23	41
Kamal	78	57	93	34	67

b) Open the "marks.txt" to read the data and print the name and the number of subjects a student has passed. (if the mark is greater than or equal to 45 then the student has passed the subject)

Student's name	No of subjects passed
Amali	4
Kumari	5
Saman	2
Kamal	4

c) Also find and print the name of the student who has passed highest number of subjects. (consider that there will be one student with the highest number of passes in the file)

Save your program as ***red2.cpp***

Question 03 **(25 Marks)**

Write a C++ program to find the prices of packages provided by a Beauty Spa.

Package	**Head Massage (H) Rs:**	**Foot Massage (F) Rs:**	**Facial Clean up (C) Rs:**
Platinum	2000	2500	2200
Gold	1900	2100	1800
Silver	1750	1900	1700
Bronze	1600	1700	1500

Input the selected package (Platinum / Gold / Silver / Bronze) and the Service needed (H/F/C), and calculate the Total Price. You should allow the user to enter many services if they wish to have. If the customer selects more service, then they should be given a discount for the total price as shown in the table below.

Selection	**Discount**
Only 1 service	No discount
2 services	10%
3 services	20%

Print appropriate error messages when wrong values are entered.

Sample output 1:

```
Platinum
Gold
Silver
Bronze
Input Package : Platinum


Head Massage (H)
Foot Massage (F)
Facial Cleanup (C)
Input service : H
Do you need another service :y


Head Massage (H)
Foot Massage (F)
Facial Cleanup (C)
Input service : F
Do you need another service :n
Total Price to be paid Rs: 4050.00
```

Sample output 2:

```
Platinum
Gold
Silver
Bronze
Input Package : Gold


Head Massage (H)
Foot Massage (F)
Facial Cleanup (C)
Input service : a
Invalid input
Do you need another service :y


Head Massage (H)
Foot Massage (F)
Facial Cleanup (C)
Input service : H
Do you need another service :n
Total Price to be paid Rs: 1900.00
```

Save your program as ***red3.cpp***

Question 04 **(25 Marks)**

Write a C++ program to do the following;

a) Create a char array called **NameArr** of size 15 to store a word. Create another char array called **reverseName** of size 15.

b) Implement a function called **getLength()** to return the size of the given array. Function prototype is given below.

```
int getLength(char arr[]);
```

c) Implement a function called **reverseArr()** to reverse the characters in a given array and store the result in another array. Function prototype is given below

```
void reverseArr(char array1[], char array2[]);
```

Hint: Call **getLength()** function implemented in section b) if needed.

d) In your main function allow the user to enter the name from the keyboard and store it in array **NameArr**. Call **reverseArr()** to reverse the content and store the result in array **reverseName**. Display the two arrays.
User should be able to enter names several times. Prompt the user "Do you need to enter another Name?" If user enters "Y" ask the user to enter a name again and display the reverse name. If the user enters "N" then exit from the program.

Save your program as ***red4.cpp***

End of Paper

Student ID :

IP Address :

Grading Sheet

Question 01

Compiles correctly 2.0
Executes correctly 3.0
Function prototype (0.5 x 5) 2.5
Function implementation (1x3, 1.5x2) 6.0
Declaring variables 2.0
Main function
keyboard input (0.5 x 5) 2.0
avg of assignment marks.....1.5
avg of practical marks 1.5
final marks 1.5
find grade 1.5
print details 1.5

(25 Marks)

Question 02 **(25 Marks)**

- Program compiles correctly.....-2.0
- Program executes correctly .....-3.0
- Declaring file variables correctly .....-2.0
- File created correctly (data written to file correctly) .....-3.0
- Input data from the keyboard .....-2.0
- Read data from the file correctly .....-2.0
- Use of repetition .....-4.0
- Calculating the no of passes correctly .....-2.0
- Finding the highest correctly .....-3.0
- Printing the output correctly .....-2.0

Question 03 **(25 Marks)**

- Program compiles correctly 2.0
- Program executes correctly 3.0
- Correct declaration of variables.....2.0
- Input data to the variables.....4.0
- Implementing multiple selection.....6.0
- Calculating the Total Price correctly 3.0
- Implementing repetition correctly 3.0
- Printing the error message..... .2.0

Question 04 **(25 Marks)**

- Compiles Correctly.....2.0
- Executes Correctly 3.0
- Arrays Created correctly.....2.0
- Read name from keyboard.....1.0
- Correct control structure is used.....4.0
- getLength() implementation 2.0
- reverseArr() implementation 6.0
- calling functions 3.0
- Displaying arrays 2.0