CS-1002 Programming Fundamentals Spring - 2023

[Assignment – 02] **[Total Marks 70]**

Question 1:

FASTtalk, a program initiated by FAST for the employees, it provides the following **Four different data and call packs** for its employees.

[1] Pack A:

a. **Data:** Rs. 100 per month, 1 GB data is provided. Additional data charges are: Rs. 20 per 100 MB.
b. **Call:** RS. 500 per month, 100 OFF net minutes, 200 ON net minutes, Additional call charges per minutes are: (OFF net: 3.75/min and ON net: 2.25/min)

[2] Pack B:

a. **Data:** Rs. 350 per month, 5 GB data is provided. Additional data charges are: Rs. 15 per 100 MB.
b. **Call:** RS. 800 per month, 250 OFF net minutes, 350 ON net minutes, Additional call charges per minutes are: (OFF net: 3.25/min and ON net: 2/min)

[3] Pack C:

a. **Data:** Rs. 500 per month, 7 GB data is provided. Additional data charges are: Rs. 13 per 100 MB.
b. **Call:** RS. 1000 per month, 350 OFF net minutes, 300 ON net minutes, Additional call charges per minutes are: (OFF net: 2.75/min and ON net: 1.75/min)

[4] Pack D:

a. **Data:** Rs. 1000 per month, Unlimited Data is provided. Additional data charges are: Rs. 10 per 100 MB. Fair Usage policy of (Max: 50 GB per user per month)
b. **Call:** RS. 1500 per month, 750 OFF net minutes, 1000 ON net minutes, Additional call charges per minutes are: (OFF net: 1.50/min and ON net: 1/min)

Part A: Write a C++ program that calculates an employee's monthly bill. It should ask how many Data (GBs) , Call (minutes OFF net) and Call (minutes ON net) the employee has used in the month, and which pack the employee has subscribed for. It should then display the total amount due.

Part-B: Modify the program in Part A so that it also displays how much money Pack A employees would save if they purchased pack B or C or D, and how much money Pack B employees would save if they purchased Pack C or D. If there would be no savings for particular pack, it should print the appropriate message.

Question 2:

FAST is planning to benefit its employees by paying the **TAX** itself on purchase/upgrade of new cellphone in a promotion offer of their program **FASTtalk.**

Write a C++ program for **FASTtalk** to calculate the total tax payable on a cellphone. The payment plan according to the price range of a mobile phone is listed below:

Imported Mobiles Fixed Taxation Plan (FAST Employees)			
Mobile Price Range (PKR)	Custom Duty	Sales Tax	Income Tax
0-50000	2%	4%	Nil
50001-70000	5%	5%	Nil
70001-100000	9%	6%	5%
100001 & 150000	17%	13%	6%
150001 & above	20%	15%	8%

Expected Input:

Enter the price of the imported mobile? 65000

Expected Output:

Custom Duty: 3250

Sales Tax: 3250

Income Tax: Nil

Total Tax payable by FAST on behalf of Employee: 6500

Question 3:

FAST is planning to automate order and bill process of the cafeteria.

Write a C++ program **FASTcafe** that have the following functionalities:

[1] Takes the order from the user

[2] Calculate the bill accordingly.

[3] Add some discount on the bill that exceeds the limit of the payment. The discount should be added according to the following table:

Bill range	Discount Percentage
Within 1000	**5%**
1000 - 1500	**10%**
1500 - 2000	**15%**
2000 - 2500	**20%**
2500 - 3000	**30%**
Above 3000	**50%**

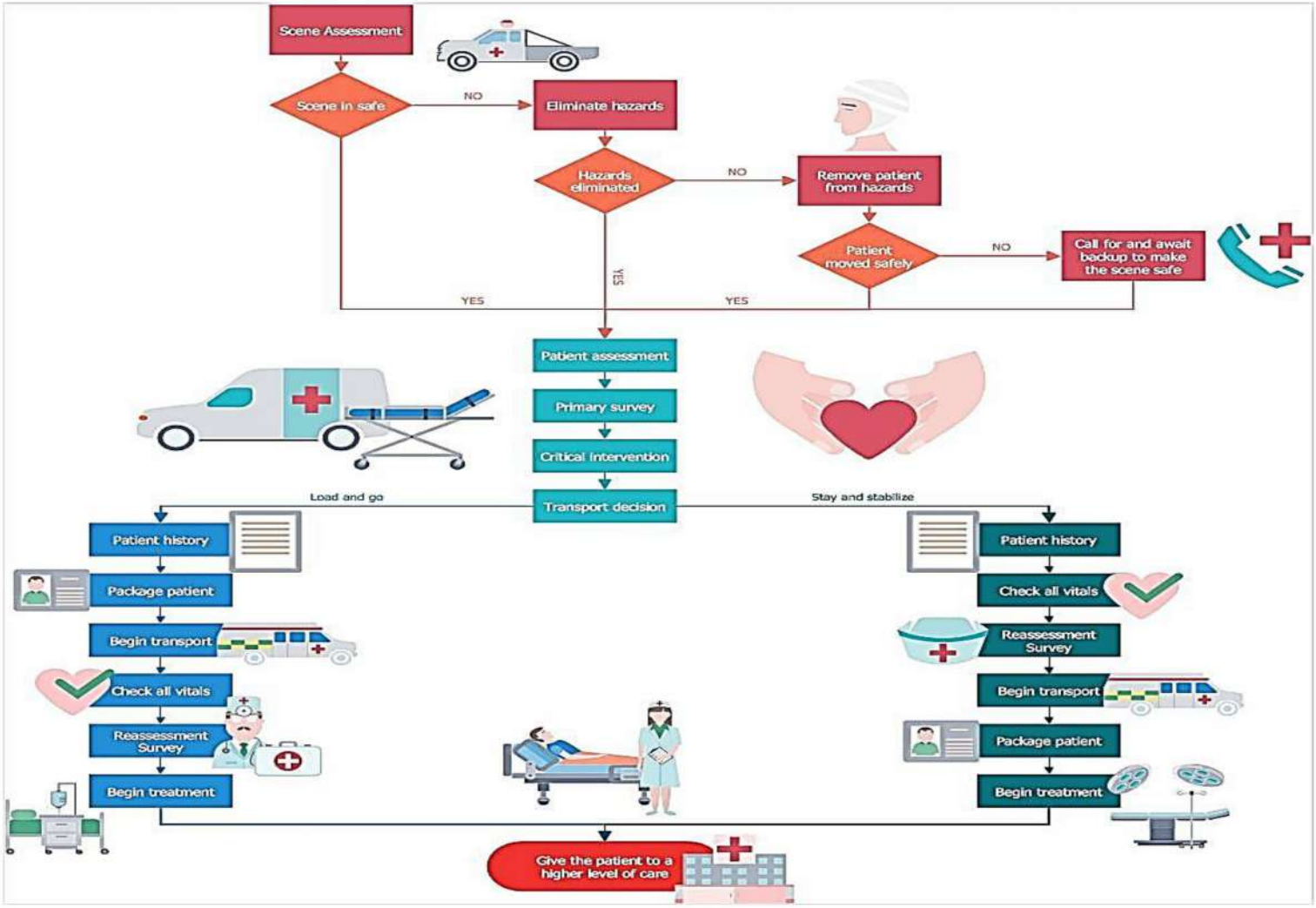
You are required to display the Menu of the restaurant as follows.

########### -> welcome to FASTcafe <- ###########
Please select the option:
[0] Takeaway
[1] Dine in
[2] Delivery
Selected Category: 0
########### -> welcome to Takeaway menu <- ###########
[0] Burger
[1] Paratha roll
[2] Pakistani food
Selected Category: 0
Select burger type:
[1] PF_Ragra11 (Rs: 299)
[2] OOP_Chatkhara (Rs: 499)
[3] Hot_DS (Rs: 599)
[4] RedHot_Algo (Rs: 699)
Selected Category: 1
Select paratha roll type:
[1] FAST_MalaiParatha (Rs: 299)
[2] CS_CheeseParatha (Rs: 399)
[3] DS_DhamakaParatha (Rs: 599)
[4] AI_DoubleTroubleParatha (Rs: 699)
[5] CY_SecurityTightParatha (Rs:499)
[6] SE_MeethaParatha (Rs:199)
[7] EE_ParhakuParatha (Rs:799)
Selected Category: 2
Select Pakistani food type:
1) pointerHaleem (Rs: 199)
2) loopNihaari (Rs: 199)
3) arrayDaal (Rs: 149)
4) recursiveGhosht (Rs: 399)

Note: The menu is same for Dine in and delivery. Display the total bill and adjust the discounted value.

Question 4:

FAST is planning to make a healthcare management system. Write a C++ program that implements the following healthcare management workflow. Your program should lead a person through the steps to help patients. Here is an example of the program's output (following one of the flows):



Is the scene safe? (Y or N): N
*****Eliminating hazard*****

Is hazard eliminated? (Y or N): Y
*****assessing the patient*****
*****conducting primary survey*****
*****providing critical intervention*****

Is the patient stable now? (Y or N): N
*****take patient history*****
*****Pulling insurance details*****
*****transport*****
*****checking vitals*****
*****reassessing patient's condition*****
*****treating*****
*****handing patient over to higher level of care*****

Question 5:

Login management system for **FASTcafe**.

Given below is a table where each ID has a role assigned to it and a password, corresponding to that ID:

ID	Role	Password
100	student	**10220**
101	student	**16010**
102	student	**11002**
103	student	**22342**
104	student	**44323**
105	student	**33354**
106	student	**87685**
107	student	**99089**
108	student	**34562**
109	student	**44255**
110	teacher	**32415**
111	teacher	**90784**
112	teacher	**78685**
113	IT staff	**15254**
114	**IT staff**	**81973**

Write a C++ program that takes ID from the user.

[1] Based on the ID

- **[a]** determine the role
- **[b]** display appropriate messages
  - **[i]** to ask the user to enter his/her password
    1. if the role is a student then display "Dearstudent please enter your password.
    2. If the password provided by the user is correct the program will print the greeting message,
    3. otherwise, the program will display an error message "You have entered an incorrect value" and
    4. the program ends.
    5. If the ID does not exist, the program will print Incorrect ID.

[2] Note: This should be done using switch and nested switch only.

Question 6:

Burger Shop.

Welcome to your burger shop!

Write a C++ program for your burger shop that takes orders for a tasty burger from the user, in just 5 steps.
Attached below is the menu that you are going to display to the user in a nice attractive format.

[1] User can only add one type of bun to the burger.
[2] Maximum two types of cheese,
[3] 1 itemfrom the category "turn up the taste",
[4] maximum 3 from fresh'N it up
[5] 3 from the sauces.
[6] If the user presses 0 then you are going to skip that category (user cannot skip "choose your bun" and "turn up the taste").

Cost:

[a] Each element from the "choose your bun" costs .72$.
[b] Each element from the "make it cheesy" costs .5$.
[c] Each element from the "turn up the taste" costs 1.2$.
[d] Each element from the "fresh'N it up" costs .2$.
[e] Each element from the "get saucy" costs .3$.
[f] After taking the input from the user. Total cost will be displayed for the burger in $.

NOTE: This question should be attempted using switch and nested ifs.

Question 7:

FAST Admission process.

Welcome to FAST!

Admissions office of your university is really overburdened by the questions regarding admission.

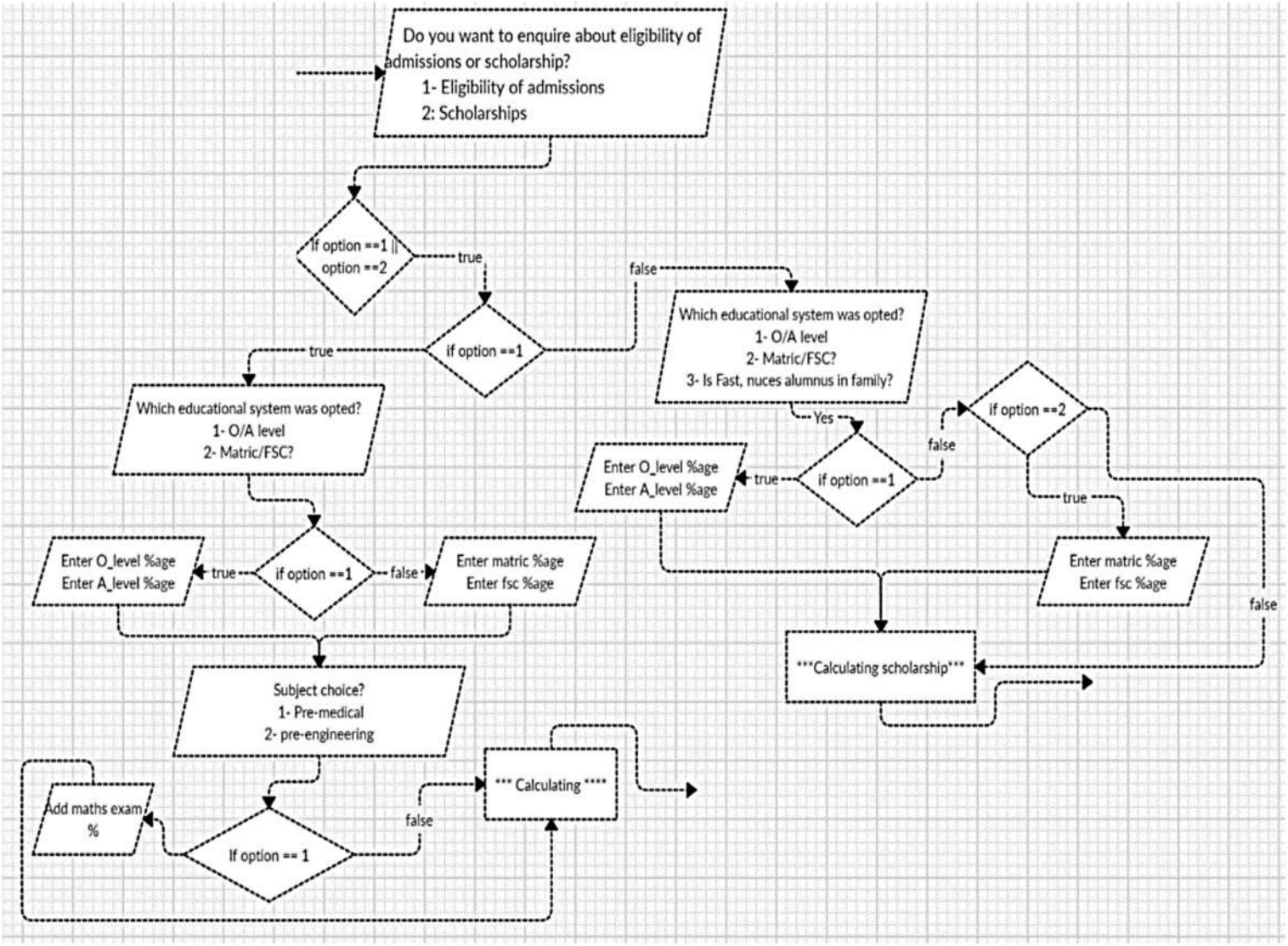
There are two types of questions that are most frequently being asked by the interested candidates or their guardians.

[1] Is a person eligible to apply for FAST-NUCES?

[2] Is there any scholarship offered by the University?

You have been assigned to make software for your university's admissions office, which has to be deployed on some PCs. Interested people (candidate or guardian) can use this software to determine the eligibility criteria or the scholarship offered by the university.

The flowchart below that takes input from the user. If the user wanted to know the eligibility criteria,then appropriate inputs should be taken and output should be a table. (Format of the table can be seen below).



	O-level/ matric	A-level/ FSC	Add_maths	Admissiontest
Distribution	**15%**	**35%**	**pass**	**50%**
Obtained	**x (entered by user)**	**y (entered by user)**	**Pass (if scored 50% in add_maths) else fail** **For pre-engineering students add_maths exam is already set as pass** **If this is fail->student is not eligible**	**Determine what percentage from the 50% weightage of the admission test should be achieved to meet the minimum (overall) eligibility criteria of 75% (As evident from the table below).** **Also, inform how many marks a student needs in the admission test if the total marks are 250.**

If the user is eligible for FAST-NUCES display the following table and ask the user to enter a preferred degree and calculate the marks needed in the admissions test to secure a position for the degree.

ID	Degree	Merit
1	BS Software Eng.	**79%**
2	BS Computer Sciences	**80%**
3	BS Artificial intelligence	**75%**
4	BS Data Sciences	**76%**
5	BS Cyber Security	**77%**
6	**BS Electrical Engineering**	**76%**

Scholarship is provided based on the following table. Display the following table and output the appropriate message if the individual is eligible for scholarship or not. If he is eligible, then howmuch scholarship could be offered to him/her?

O/A level	90% above - O Level	10%
	90% above - A Level	30%
Matric/FSC	90% above - Matric	10%
	90% above - FSC	30%
Alumnus	Blood relation (sibling, parents)	20%
	Maternal or paternal cousin	10%

If an individual is eligible for more than one scholarship, then display the appropriate message and only the highest %age scholarship will be awarded. For example, if a student scored 95% in matric and 92% in FSC, he/she will be awarded with 30% (i.e. of FSC only).

Question 8:

Instructions.

[1] Submission Format:

[a] You have to solve it on Microsoft Visual Studio. Write your name, roll number, and question number on top of every question program using proper comments. Submit only .cpp file of your program. Question1_Rollnumber.cpp file.

[b] For example (Question1_22I-1234.cpp)

[2] Combine all your work in one folder. The folder must contain **only the .cpp files** as instructed in [1][a].

[3] Rename the folder as Roll-Num_Section_Name (e.g. 22i-1234_A_Ali) and compress the folder as a zip file. (e.g. 22i-1234_A_Ali.zip).

[4] Do not submit .rar file.

[5] Submit the .zip file on Google Classroom within the deadline.

[6] Submission other than Google classroom (e.g. Email etc.) Will not be accepted.

[7] The student is solely responsible to check the final zip files for issues like corrupt file, virus in the file, mistakenly exe sent.

[8] If instructor cannot download the file from Google classroom due to any reason it will lead to zero marks in the assignment.

[9] Deadline to submit assignment is **19th March 2023 11:59 PM.**

[10] Assignment submitted after the deadline will be marked DIRECT ZERO.

[11] You are supposed to submit your assignment on **Google Classroom (Classroom Tab Only, Not Lab).**

[12] Correct and timely submission of the assignment is the responsibility of every student; hence no relaxation will be given to anyone.

[13] For timely completion of the assignment, start as early as possible.

[14] Plagiarism is not allowed. If found plagiarized, you will be awarded zero marks in all the assignments.

NOTE:

[a] Consider the corner cases while programming. What if the user enters any number other than the menu ids, the program should end?

[b] Display appropriate messages where needed. Keep in mind you have to make **software to assist the user**.

[c] Display appropriate table with correct format and styling.