EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Final Examination, Summer 2024 Semester

Course:	CSE412 Software Engineering, Section-2
Instructor:	Nishat Tasnim Niloy, Lecturer, CSE Department
Full Marks:	40 (30 will be counted for final grading)
Time:	1 hour 30 Minutes

Note: There are FIVE questions, answer ALL of them. Each question's course Outcome (CO), Cognitive Level, and Mark are mentioned at the right margin.

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1. In analyzing an e-commerce system, the analyst identified five function types with the following activities: [CO2, C3, Mark: 07]
   a. 150 simple and 50 average activities fall under external input types
   b. 250 average and 100 complex activities fall under external output types
   c. 150 average and 100 complex activities are categorized as external inquiries
   d. 150 simple activities related to internal logical files
   e. 70 simple and 20 complex activities associated with external interface files.

   Fourteen complexity weighting factors are considered to adjust the function points. Among those, five are very essential, two essential, and the rest slightly essential. The language factor for developing this project in PHP and HTML5 is 52. Use functional point analysis to estimate the lines of code for this project. You may need the above tables for your calculation.

   You can get help from the following table for reference:

Function type	Simple	Average	Complex
External Input	3	4	6
External Inquiry	3	4	6
External Output	4	5	7
External Interface File	5	7	10
Internal Logical File	7	10	15

complexity weighting factor
Very essential: 5
Essential: 4
Moderately essential: 3
Slightly essential: 2
Not essential: 1

2. In a cricket premier league, a feature calculates the base price of the cricketers in the auction. The distribution of the base price is based on two conditions- the age of the players and their current performance level in cricket: [CO2, C3, Marks: 10]
   a. If a player's age is between 27 and 31 and the performance level is equal to or above 7, the base price will be 250L. With the same age, if the performance level is between 6 and 4, the base price will be 150L.
   b. If the age is above 32 and the performance level is equal to or above 6, the base price will be 100L.
   c. If the age is below 27 and the performance level is equal to or above 6, the base price will be 75L.

   For the rest of the players, the base price will be 40L. Design a list of test cases for each scene using the decision table approach of the black box testing.

3. In a stock market system, it is essential to keep various clients, such as traders, investors, and financial analysts, updated on real-time stock price changes. The system consists of an entity named "Stock" that maintains the current price and a list of interested clients. Each client registers for updates and implements an "update" method to handle price changes. When the stock price changes, the Stock notifies all registered clients, enabling immediate actions by traders, future planning by investors, and report updates by analysts. Clients can also deregister when they no longer need updates, ensuring efficient and relevant [CO2, C3, Mark: 07]

communication. **Apply** an appropriate design pattern on the above scenery with proper justification. Explain the solution using a UML diagram to show your idea.
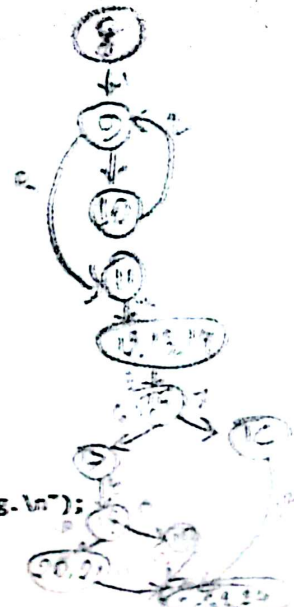
4. [CO2, C3.
Mark: 10]

```
3    int main() {
4        char studentID[13];
5        float cgpa;
6        int i;
7
8        printf("Enter your ID:\n");
9        for (i = 0; i < 13; i++){
10           scanf("%c",&studentID[i]);
11       }
12       printf("Enter your cgpa:\n");
13       scanf("%f",&cgpa);
14
15       if (studentID[3]>52)
16           printf("visit your advisor\n");
17       else{
18           if (cgpa<=2.25)
19               printf("Visit your advisor\n");
20           else
21               printf("You can do your own advising.\n");
22       }
23       return 0;
24   }
```

Consider the above program. Now, develop the Decision-to-Decision graph for the program to **prepare** a list of test cases from the independent paths.

5. Check the project for question number 1. Your project manager needs to choose between two teams to assign the project. One team has high programmer capability, average application experience, and low programming language experience. The other team has average programmer capability, very high application experience, and very low programming language experience. **Find** a team that would be better suited to complete this project based on these factors. You can get help from the following table for reference:

[CO2, C3.
Mark: 06]

Software Project	a	b	c	d
Organic	3.2	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Embedded	2.8	1.20	2.5	0.32

Personal attributes

Cost driver	Very low	Low	Average	High	Very high
Analyst capability	1.46	1.19	1.00	0.86	0.71
Application experience	1.29	1.13	1.00	0.91	0.82
Programmer capability	1.42	1.17	1.00	0.86	0.70
Virtual machine experience	1.21	1.10	1.00	0.90	--
Programming language experience	1.14	1.07	1.00	0.95	--

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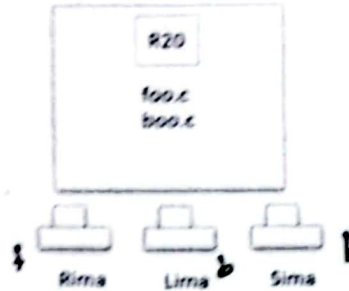**Class Test I Examination, Summer 2024 Semester**

Course: **CSE412 Software Engineering, Section-2**
Instructor: **Nishat Tasnim Niloy, Lecturer, CSE Department**
Full Marks: **15 (Will be converted into 10)**
Time: **30 Minutes**

Note: There are TWO questions, answer ALL of them. Course Outcome (CO), Cognitive Level, and Mark of each question are mentioned at the right margin.

1. [CO1, C3, Marks:8]

Rima needs to work on foo.c and Lima is on boo.c. They both checked out from the 20th revision of the repository. After editing, Rima committed first. At that time, Sima joined the team to work on boo.c and checked out the file as well. After that Lima committed her work and then Sima checked in her work. Lima found that she had made a mistake and needed to redo her work. She edited her mistake and checked it out again. **Apply** the source code management (SCM) algorithm to show all the changes so that no one's contribution gets removed. Mention the final versions in the local storage of Rima, Lima, and Sima.

2.
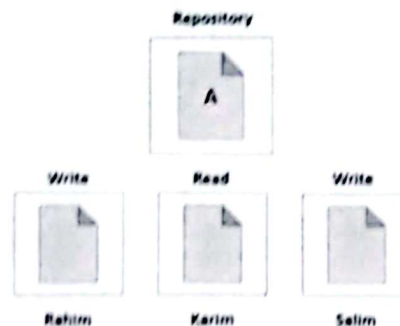
Suppose, Rahim and Salim want to access separate files from repository A. [CO1, C3, They need to update those different files. However, all of their work requires a Marks: 7] long period to complete. In this regard, Rahim and Salim read their files at a time, then Rahim updated his file first, and then Salim updated his file. Between those updates, Karim reads files from the repository. **Choose** the best version controlling algorithm, i.e., Lock-modify-unlock or Copy-Modify-Merge in this scenario and **explain** that algorithm for the above problem.