National University of Computer and Emerging Sciences
Chiniot-Faisalabad Campus

Software Design and Analysis (CS3004)

Sessional-I Exam

Date: September 23-2024
Course Instructor(s)
Saba Ghani, Tehreem Aslam, Faraz Gorsi

Total Time (Hrs):	1
Total Marks:	45
Total Questions:	3

Student Signature

Roll No   Section

Attempt all the questions.

CLO # 2: Explain software development lifecycle.

Q1. Attempt this question on the question paper.
(a) Match each description below to the **SINGLE MOST APPROPRIATE OPTION** among the following.
(Note: terms or types may apply to one or more than one description)   [10]

A. Agile
B. Iterative process model
C. V-model
D. Spiral model

E. Extreme programming
F. Waterfall model
G. Scrum
H. Incremental process model

1. __V-model__ approach focuses on continuously testing and integrating small software releases to ensure high quality.

2. __Scrum__ process emphasizes short development cycles called sprints with frequent feedback.

3. __waterfall model__ is suitable when requirements are well-defined upfront and unlikely to change.

4. __Spiral model__ involves exploring and mitigating risks through a series of iterations.

5. __Extreme Programming__ Utilizes "test-first development" – writing tests before coding helps to clarify requirements.

6. __Increment Process model.__ manifesto emphasizes individuals and interactions, working software, customer collaboration, and responding to change.

7. In the __V-model__ testing is planned in parallel with each development stage, ensuring early detection of defects.

8. __Iterative Process model__ approach emphasizes improving and refining the product incrementally over time rather than delivering it all at once.

9. In the __Agile__ model, testing and feedback occur after each phase, allowing teams to make necessary adjustments for the next iteration.

10. One of the key benefits of the __Spiral model__ is its focus on identifying and mitigating risks early in the development process

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CLO # 3: Use different UML notations for software design

Q2. Case Study: Web-Based File Storage and Sharing System

A startup company is developing a **web-based file storage and sharing system** to allow individuals and organizations to securely store and share their files over the cloud. The system must support uploading, downloading, organizing, and sharing files and folders among users. The platform should be intuitive, secure, and scalable, meeting the needs of individual users as well as large organizations.

System Overview

The file storage and sharing system will allow users to:

1. Upload files to their account.

2. Organize files into folders.

3. Share files or folders with others by setting specific permissions.

4. Access files from any device with internet access.

5. Collaborate on files with other users, allowing for group work.

6. Track version history and revert changes to previously saved versions of files.

7. Users can search for files based on file name, type, or tags.

8. The system provides all the necessary functionality such as sign-up, or deleting or renaming a folder etc.

System Users

1. **Regular Users (Individuals)**: Upload, organize, and share files for personal use.

2. **Business Users (Organizations)**: Teams working together on projects, managing file permissions across different departments.

3. **Administrators**: Manage user accounts and monitor storage usage.

(a) Identify 10 functional requirements [10]

(b) Create a use case diagram for the system [10]

(c) Write use case description for "Upload File". Only consider given fields e.g., "Description, pre-condition, post-condition, main scenario, alternative scenario". [05]

CLO # 3: Implement object-oriented principles for software analysis and design

Q3. (a) Give one example of each type of software design methodology. [04]
1. Formal method
2. Data oriented

(b) Identify the problem and correct the following poorly written software requirement. Rewrite the requirement to make it clear, measurable, and unambiguous. [06]
1. The system shall be fast.
2. The application must work on all devices.
3. The system shall provide excellent performance

Question# 02:

(a) Functional Requirements:

→ There should be an login module for all users to sign in.

→ The system should have a functionality to upload a file.

→ The system should have a functionality to create, delete or rename a folder

→ The system should have an search module which can search on the basis of filename, type or tags.

→ The system should have a functionality where user can see how much storage he has already used like we said storage manager.

→ The system should have a functionality where user can allow auto uploads of files or folders.

→ The system should have functionality where user can share files to others.

→ The system should have functionality where users can download his already uploaded files to his device

c)

Description:

User can upload it's any type of file to save it's device storage and to keep safe his file for future use.

Pre condition:

The pre condition to upload a file is to login in storage system and system has free storage

Post condition:

After uploading the file shouldn't have any file with same name otherwise it will get merged.

Main scenerio:

User will login and uplode file.

Alternative:

User will login and see storage is full so he will delete first then upload.

Questions 3

a) Formal Method:

The example for formal method is any 2 critical security system because. Formal methods are totally dependents on the rules of math so it is best to encrypt a system

3

b) Data Oriented:

Any system that is highly intensive with data. Just like we can say a NADRA office it should have data oriented methoddogy system.

c) 1. The system should provide an upload speed of 100mbps and. download speed of 200 mbps.

2. The application must work on all type of device irrespective of android, ios, or windows.

3. The system should work when traffic is high it should allow maximum of 50,000 users at time.