BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Final   Semester: Fall 2023
Duration: 1 hour 45 mins + 10 mins   Full Marks: 30

CSE 471: System Analysis and Design

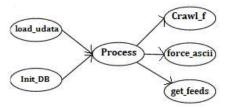|		
1 CO1	Answer the following question in short. No need to add details. A. Suppose, you are creating a web page where users can write and post blogs. There is no complex data, only the text data will be stored for a short period of time. **Explain** which Storage format is suitable for this webpage. B. Consider developing an online reservation system for a hotel. It contains several functions which rely on the successful execution of the previous one, forming a cohesive sequence for handling reservations. For instance: the "Confirm Reservation" function requires guest information to validate and complete the booking. **Describe** what kind of cohesion is maintained in the above scenario C. Structural Complexity of a method is S(i) = fan-out(i) * fan-in(i). **Calculate** the structural complexity of method Process. 	2*3
2 CO1	Consider a RDBMS team working to store the records of a newly established school in your area. They have identified the id (10), name (30), mobile (11), guardian's email (25) and address (50) as the fields of records. Considering an overhead of 25% on data volume with initial table size 1500 records and a growth rate of 1000 records per 6 months, calculate the expected volume of the database table in 3 years.	4
3 CO2	The Bangladesh government is planning for an E-voting system to cast the votes of every citizen of the country at the exact time with appropriate results. Following is the initial proposal of it. Every voter first inputs their NID number and Fingerprint into the system. Verify identity process receives this data and compares the NID with existing data from the NID data store. It also extracts the existing fingerprint from the data store and forwards it to compare the fingerprint along with the new fingerprint (i.e. given by the citizen). The process uses the Neural Network technique and sends back the match result. Based on the result, the verify identity process sends Invalid fingerprint messages to the voter. The show candidate process collects the list of all candidates from the candidate data store and sends it to the voter. The voter then chooses his/her favorite candidate and the casting vote process receives it and stores it in the votes. It also sends an acknowledgment to the voter. Administrators can request total voting information to generate reports. It collects all voting information from the Votes data store, prepares a report, and sends it to the administrator. In the end, the admin can declare the election result. There is also the presiding officer who can send start/stop signals to the	3+5 =8

	voting status process. He can also pause the voting system in case of any emergency. Another responsibility of the presiding office is to add new candidates to the system. 1. **Design** a context diagram based on the above scenario. 2. **Design** a level 1 diagram using the above scenario. Also, identify if there is any error in the diagram.	
4 CO2	In an Educational Testing Service (ETS) management system, various modules and interactions would be essential to handle the testing processes. Here's a scenario depicting a similar flow for an ETS management system: The Test Process Handler Module orchestrates the flow of operations for managing and administering tests within the ETS system. The Get Test Details Module accepts a test ID and retrieves details such as test name, duration, subjects covered, and instructions. The Authentication System Module validates the test-taker's credentials before starting the test whereas the Check Test Eligibility Module validates the test-taker's eligibility to take the test based on criteria such as prerequisites or qualifications. The Test Block Status Module verifies the test-taker's account status and returns a void flag if there are no blocks or issues. The Calculate Available Time Module determines the available time for the test based on the test duration and any time restrictions. The Test Administration Module handles the test-taking interface, displaying questions, accepting answers, and managing the testing environment. The Test Submission Module receives the completed test from the test-taker and initiates the submission process. The Test Evaluation Module evaluates the submitted test, calculates scores, and generates result reports.The Result Processing Module processes test results, generates reports, and updates the candidate's profile with scores and performance metrics. Lastly, Print Test Report Module generates a detailed test report for the test-taker or institutions upon completion. Now **design** a structure chart based on the above scenario.	6
5 CO2	Shworolipi is a music-streaming web application and it contains several components. The Homepage subsystem contains five components which are: Database, Music Search, Music Player, Member Accounts and Music Inventory. The Database component provides an interface, validateAccount, that is required by the Member Accounts component. Both Music Search and Database component require an interface, musicInfo, which is provided by Music Inventory Component. Member Accounts component allows to edit profile information by exposing provided interface profileEdit and uses required interface getMemberInfo provided by Database component. The Music Inventory component provides an interface called syncDB which is dependent on database updates from the Database component. There are two components outside the Homepage subsystem: Playlist and Payment Gateway. Music Player component provides an interface, playMusic which is required by Playlist component. The Member Accounts component allows users to subscribe music using getSubscription interface which is provided by the payment gateway component. Delegation connectors link these external contracts of the Homepage subsystem. The playlist component allows the payment gateway component and other components to have playlist data by provided interface readPlaylist. Now **design** a component diagram based on the above scenario.	6