


National University of Computer and Emerging Sciences, Lahore Campus

	Course Name:	Software Engineering	Course Code:	CS 3009
	Degree Program:	BS (CS)	Semester:	Spring 2023
	Exam Duration:	60 Minutes	Total Marks:	45
	Paper Date:	08-Apr-2023	Weight	15%
	Section:	ALL	Page(s):	5
	Exam Type:	Midterm-II		

Student : Name: _____ Roll No. _____ Section: _____

Instruction/Notes:

1. Attempt all questions on the question paper. Do not submit any extra sheet, it will not be graded.
2. You are allowed to use a single-sided, hand-written, A-4 size help sheet. Photocopies are not allowed.
3. State your assumptions clearly

Question 1 (Marks = 7)

In each of the following MCQs, **circle** the most appropriate **single** option. Unclear answers will not be given any credit.

- 1) In Software Design phase, which of the following remains an area of concern?
 - a. Architecture
 - b. Data
 - c. Interface
 - d. All of the above
- 2) Which of these is true about software design?
 - a. Software design is an activity subjected to constraints
 - b. Software design specifies nature and composition of software product
 - c. Software design satisfies client needs and desires
 - d. All of the above
- 3) Software design is a:
 - a. Creative Process
 - b. Linear Process
 - c. Iterative Process
 - d. a and c only
 - e. All of the above
- 4) When an already existing design and code is used with minor adjustments according to the problem, it is referred to as
 - a. Design Pattern
 - b. Reference Model
 - c. Cloning
 - d. Design Convention
- 5) Ability to prevent an attempted attack is called:
 - a. Resilience
 - b. Encryption
 - c. Immunity

d. Fault Tolerance

6) Which of the following is/are useful (and can be used) at the time of requirements analysis for better elaboration of functional requirements?

- a. Client-Server architecture style
- b. Layering architecture style
- c. Peer-to-Peer architecture style
- d. None of the above

7) Consider the following terms:

- i. Pipe-Filter
- ii. Publish-Subscribe
- iii. Call-Return
- iv. Repositories

These terms are referred as _____ in software engineering.

- a. Requirements Analysis Models
- b. Architecture Styles/Strategies
- c. Testing Strategies
- d. Design Evaluation Strategies
- e. Design Principles
- f. None of the above

Question 2 (Marks = 8)

Chose which of the 3 golden rules of UI design is related to each of the following statements/screenshot. The options mention the golden rule along with the information if the rule is followed or violated. **Circle** the most appropriate **single** option. Unclear answers will not be given any credit.

1) All the applications in MS Office use the cross button to close the windows.

- a. Place the user in control - Followed
- b. Reduce User's Memory Load - Violated
- c. Make the interface consistent - Followed
- d. Place the user in control - Violated

2) When you are about to close an application with some unsaved data, the system responds, "Do you want to save your work?"

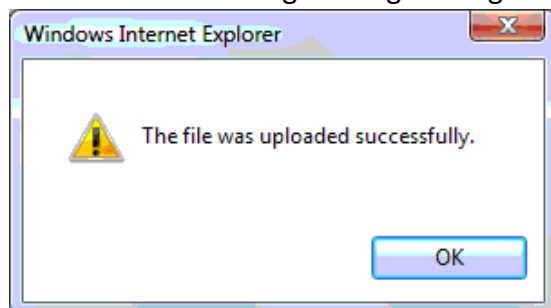
- a. Place the user in control - Followed
- b. Reduce User's Memory Load - Violated
- c. Place the user in control - Violated
- d. Make the interface consistent - Followed

3) You have developed a game in which the right cursor key makes the player jump, while the up and left cursor keys make the player go right and left respectively.

- a. Place the user in control - Followed
- b. Reduce User's Memory Load - Followed
- c. Place the user in control - Violated

d. Make the interface consistent - Violated

- 4) For a banking application, you have provided 10 menus with each menu containing ten to twelve options.
- a. Reduce User's Memory Load - Followed
 - b. Place the user in control - Followed
 - c. Reduce User's Memory Load - Violated
 - d. Make the interface consistent - Violated
- 5) Assume a user is trying to move a file to a particular location. Also assume, a file with the same name already exists at that location. A pop-up is displayed with multiple options (e.g., replace, skip, cancel, compare, etc.), out of which any one can be selected.
- a. Place the user in control - Followed
 - b. Reduce User's Memory Load - Violated
 - c. Make the interface consistent - Followed
 - d. Place the user in control - Violated
- 6) When a critical problem occurs on Windows, such as an unexpected crash, it automatically displays the blue screen of death and restarts the computer.
- a. Make the interface consistent - Followed
 - b. Reduce User's Memory Load - Followed
 - c. Place the user in control - Violated
 - d. Make the interface consistent - Violated
- 7) In a newly developed application, the keyboard shortcut for saving work is Ctrl + P.
- a. Place the user in control - Violated
 - b. Make the interface consistent - Violated
 - c. Make the interface consistent - Followed
 - d. Reduce User's Memory Load - Followed
- 8) Consider the following message dialogue box shown after successful upload of a user file:



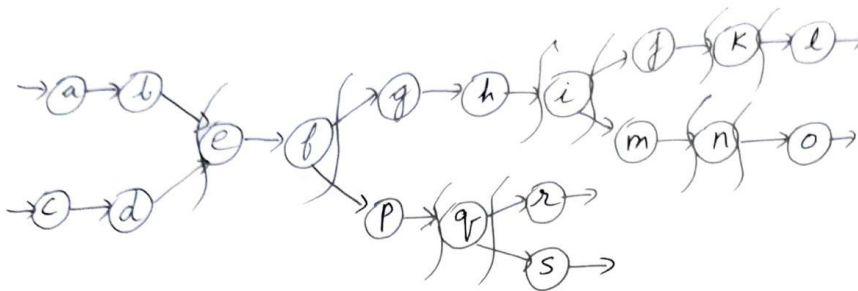
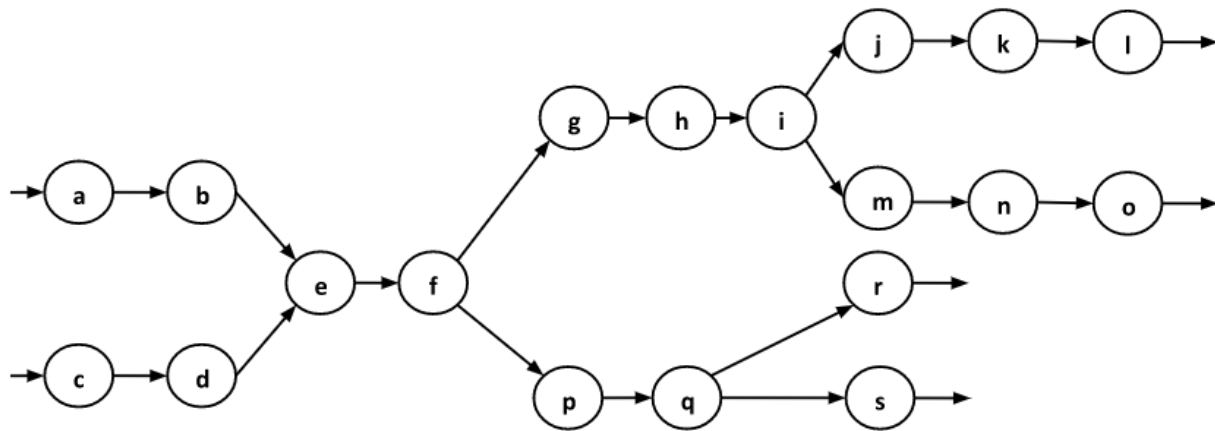
- a. Reduce User's Memory Load - Violated
- b. Place the user in control - Violated
- c. Reduce User's Memory Load - Followed
- d. Make the interface consistent - Violated

Question 3 (Marks = 15)

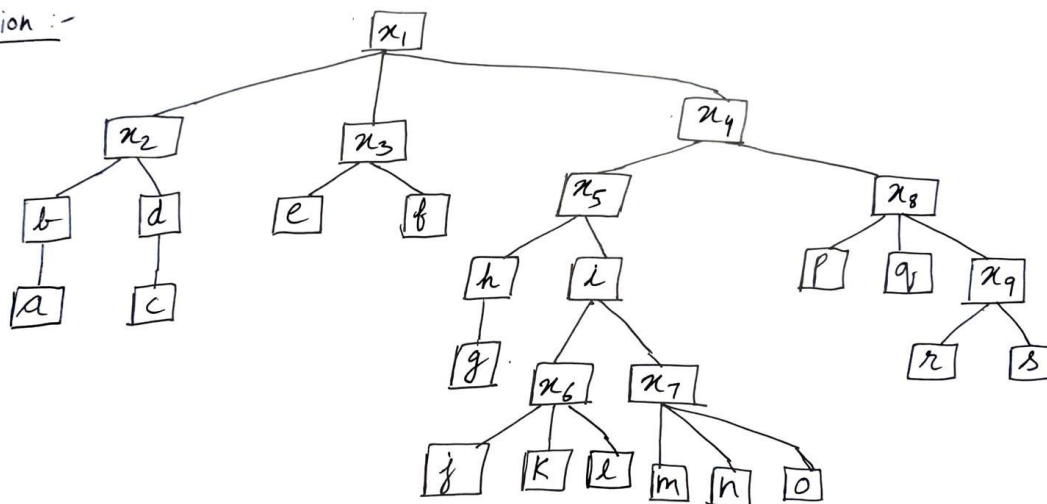
Consider the following DFD for a point-of-sales system. Arrow labels have been removed for simplicity. Perform structured design and provide the call-and-return architecture for this DFD. Design heuristics should be used to produce the final (i.e., most refined) architecture. Also mark the flow boundaries in the DFD provided below:

The following information should be used for mapping:

- 4 Transform centers: 'e' and 'f' (together); 'k'; 'n'; 'q'.
- 1 Transaction center: 'i'.



Solution :-



Question 4 (Marks = 15)

New Bank of Pakistan (NBP) needs a banking application that allows its customers to maintain their bank accounts using the internet. This application shall allow the customers with an existing bank account to perform general banking activities (such as request creation of an internet banking account, view bank account balance, Request Chequebook, Generate Mini Statement, Generate Account Statement for particular period - period not exceeding 1 year, and Request Bank draft/Pay Order) as well as certain transaction (such as pay utility bills, transfer funds, and shop online using the bank account number, change currency of their bank account, Generate Transaction PIN, Add/Remove beneficiary for fund transfers). NBP expects that, once the application is developed, its customers can login using their valid unique account number and a valid password generated by the NBP banking application considering strict security constraints and procedures. When an NBP customer requests to create his/her account through the User Interface (UI) module of this application to the account creation module to record the request in the database and inform Branch Manager through the UI management module. The Branch Manager verifies the customer details available in the database and forwards each verified request to Admin through the same UI management module. The Admin creates an account on recommendation of the Branch Manager and provides the customer with a unique login id through the verified email. The password is generated by the same module once account creation is successful. In addition, the Branch Manager is notified about the success of the account creation process. In case the account creation process is not successful, the Admin rejects the request and the Branch Manager is notified about the rejection. NBP is concerned about secure database management during all interactions of the modules with the database.

To do: Identify components of the NBP system and draw component diagram for the NBP application discussed above. Use ball and socket notation. Appropriately label the 'Requires' and 'Provides' interfaces of the interacting components.

