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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Spring 2025
Course Code: CSE413, Course Title: Mobile Application Design
Level:4 Term:1 Batch: 61

Time: 02:00 Hrs **Marks: 40**

Answer ALL Questions [Optional]

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.		MediTrack is a mobile health monitoring app that tracks users' vital signs, provides personalized health tips, and sends alerts when abnormal readings are detected. The app retrieves real-time data—such as nutritional information and public health statistics—from external health data providers via RESTful APIs. Given the sensitive nature of the data and the need for rapid, accurate updates, consider the following questions:		**CO 2**
	a)	In the context of MediTrack, explain the working process of an API. **Identify** and **discuss** two specific security measures that should be implemented in MediTrack to protect sensitive user data during API communication.	**[3]**	
	b)	**Describe** the key steps involved in fetching the latest nutritional data from an external server using a RESTful API in MediTrack. **Justify** your explanation with Flutter code fragments and comments that illustrate how the request is made and how the response is handled.	**[4]**	
	c)	**Explain** the role of JSON in MediTrack's data exchange process with external health data providers. Why is JSON particularly suited for this application?	**[3]**	
2.		*Imagine a task manager app where users can add, update, or delete tasks using voice commands. This app uses Voice User Interfaces (VUI) to allow hands-free interaction, making it convenient for users who are busy or have limited mobility.*		**CO 3**
	a)	**Compare** two different AR approaches for enhancing the learning experience in the app. **Evaluate** their pros and cons, and **justify** which approach would be more effective for Flutter integration, considering performance and user engagement.	**[3]**	
	b)	Voice User Interfaces (VUIs) are transforming mobile app interactions. Critically evaluate the advantages and limitations of using VUIs compared to traditional touch inputs in mobile apps. Now **implement** a Flutter speech-to-text feature using the speech_to_text package, and **analyze**.	**[7]**	

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3.		You are developing a mobile app called Kayu for a travelling agency, that would show picturesque caves in Thailand for attracting visitors. By clicking on any primary image, the screen transitions to the next page with detailed pictures of the caves with descriptions. Also, there's a blue button saying "Raan A Han" on the second screen that leads the user to finding nearby restaurants for enjoying the view and eating Thai cuisine. 1. If the client wants seamless transition between the screens which animation tool, would you propose? **Justify** your answer. 2. **Implement** the animation feature in flutter. 3. Now, the client wants to make the button more interactive. So, you proposed to make the button color become from blue to red upon click. **Create** the code snippet for implementing this feature.	**[10]**	**CO 4**
4.	***a)***	A healthcare app is using the Fibonacci sequence to model patient recruitment growth in medical trials. **Create** a function fibonacci(n) that returns the nth Fibonacci number, and write comprehensive unit tests to **verify** its correctness for medical decision-making.	**[5]**	**CO 4**
	b)	You are developing a cross-platform app using Flutter and React Native. You need to decide which framework to use based on the project requirements. **Implement** a simple UI example in Flutter that displays a centered text widget with the message "Hello Flutter" (make the text italic) and an AppBar with the title "Flutter App".	**[5]**	