VIT
Vellore Institute of Technology
CHENNAI

Continuous Assessment Test (CAT) – I Aug 2024

Programme	:	B. Tech(CSE)	Semester	:	Fall Semester 2024-2025
Course Code & Course Title	:	BCSE315L & Wearable Computing	Class Number	:	CH2024250101344 CH2024250101349
Faculty	:	Dr. Anita Christaline J. Dr.V. Noel Jeygar Robert	Slot	:	B1+TB1
Duration	:	90 Minutes	Max. Mark	:	50 Marks

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.

Answer all questions

Q. No	Description	Marks
1.	You are responsible for deploying wearable fitness trackers for employees in a corporate wellness program. These devices will monitor physical activity, sleep patterns, and heart rate, transmitting the data to a central server for analysis. Recently, some employees have raised concerns about data privacy, and there have been issues with intermittent data loss. a. How would you address employees' concerns about the privacy of their health data collected by these wearable devices. **(5 Marks)** b. Identify the steps that you would take to prevent data loss and ensure the reliable transmission of data from the wearables to the central server? **(5 Marks)**	10
2.	Highlight the influence of emerging Human-Computer Interaction (HCI) technologies on user experience design for wearable devices. Examine how these advancements are shaping the design principles and methodologies employed to create intuitive and immersive interfaces. Illustrate examples of innovative HCI applications within wearable systems	10
3.	Imagine you are a product manager for a tech company developing a new line of wearable devices designed to monitor various health metrics, such as heart rate, sleep patterns, and physical activity. These devices will use advanced sensors and AI algorithms to provide personalized health insights and recommendations to users. a. How would you assess the potential impact of the wearable device on both individual users and healthcare systems? Illustrate the data points which would be most critical in evaluating its effectiveness and usability? **(5 Marks)** b. Propose a strategy for integrating the data collected by the wearable devices into existing healthcare infrastructure that would ensure the security and privacy of users' health data. **(5Marks)**	10

4.	As part of the design process in designing wearable devices, you need to consider the fundamental building blocks of wearable computing, including sensors, processors, power management, connectivity, and user interfaces. The success of your device hinges on how well these components work together to deliver a seamless user experience.
	
	   a. How would you evaluate the trade-offs between processing power and battery life in your wearable device? Identify strategies that you could employ to balance these two critical aspects without compromising the device's performance or user experience **(5 Marks)**
	
	   b. Design a modular architecture for your wearable device that allows for easy upgrades or customization by users. How would you ensure that each component, such as sensors, processors, and connectivity modules, integrates smoothly without causing compatibility issues **(5 Marks)**
		10

5.	You are the lead architect for a project tasked with developing a comprehensive mHealth platform to support patients with chronic conditions. The platform will include a mobile app for patients, a web portal for healthcare providers, and integration with wearable devices to monitor vital signs. The system needs to handle real-time data collection, ensure secure communication between patients and healthcare providers, and deliver personalized health recommendations based on the collected data.
	
	   a. How would you design the mHealth platform's architecture to ensure it can scale and remain reliable as the number of users and data volume increases? **(5 marks)**
	
	   b. List out the key components that would include to enable real-time data collection from wearable devices and provide immediate feedback to patients? **(5 marks)**
		10

**********All the best *************