PAPER ID-310243

Roll No: | | | | | | | | | | | |

BTECH
(SEM VII) THEORY EXAMINATION 2024-25
MOBILE APPLICATION DEVELOPMENT FOR IOT

TIME: 3 HRS   **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1.   Attempt *all* questions in brief.   **2 x 10 = 20**

Q no.	Question	CO	Level
a.	How iterative prototyping and feedback loops can mitigate design risks?	1	K_1, K_2
b.	Which protocol would you choose for a low-power IoT device?	1	K_1, K_2
c.	Compare the advantages of displaying sensor data on a serial terminal versus an LCD display.	2	K_2
d.	Discuss the practical challenges of interfacing multiple sensors with a single IoT device.	2	K_2
e.	Discuss the trade-offs involved in customizing and optimizing IoT product boards.	3	K_2
f.	Evaluate the challenges of enabling wireless communication between multiple IoT kits in a large-scale deployment.	3	K_2
g.	Propose a method for storing sensor data into a Google Sheet and automating email notifications.	4	K_2
h.	Discuss the role of webhook services in IoT systems.	4	K_2
i.	Develop a comprehensive framework for the deployment of an IoT warehouse monitoring system.	5	K_2
j.	How can innovative packaging solutions improve product usability and durability?	5	K_2

SECTION B

2.   Attempt any *three* of the following: **10 x 3 = 20**

Q no.	Question	CO	Level
a.	Design and implement a program that reads data from multiple sensors and publishes aggregated data to a cloud service. Discuss how data preprocessing at the edge can reduce latency and bandwidth usage.	1	K_1, K_2
b.	Develop a comprehensive application that integrates temperature and gas sensors with the Blynk mobile app. Explain the process of ensuring real-time data synchronization and handling data conflicts.	2	K_2
c.	Design a connection diagram for an IoT-based warehouse monitoring system. Include considerations for sensor placement, wireless communication, and redundancy to ensure uninterrupted operation.	3	K_2
d.	Compare Bluetooth and Wi-Fi communication protocols for IoT applications. Discuss their respective advantages and limitations in scenarios involving high data rates and mobility.	4	K_2
e.	Discuss the impact of modularity in IoT product design. How can modular systems ensure adaptability to future technological advancements?	5	K_2

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SECTION C

3.   Attempt any *one* part of the following: **10 x 1 = 10**

Q no.	Question	CO	Level
a.	Design a fault-tolerant system for displaying sensor data on a terminal. How would you handle sensor failures or communication disruptions?	1	K_1, K_2
b.	Create a detailed program to control the intensity of multiple LEDs using an Android APK. Discuss the challenges of synchronization and latency in such a setup, especially in a high-density IoT environment.	1	K_1, K_2

4.   Attempt any *one* part of the following: **10 x 1 = 10**

Q no.	Question	CO	Level
a.	Propose a solution for displaying temperature values on a 16x2 LCD. Include considerations for power efficiency, data refresh rates, and handling faulty readings.	2	K_2
b.	Design a GPS-based IoT tracking system capable of real-time location updates and geofencing alerts. Discuss the trade-offs between power consumption and update frequency.	2	K_2

5.   Attempt any *one* part of the following: **10 x 1 = 10**

Q no.	Question	CO	Level
a.	Design a power-efficient IoT system for monitoring environmental conditions in a warehouse. Include considerations for hardware selection, energy harvesting, and data transmission.	3	K_2
b.	Critically evaluate the impact of wireless communication protocols on the performance of IoT hardware. How would you select the most appropriate protocol for a warehouse monitoring system?	3	K_2

6.   Attempt any *one* part of the following: **10 x 1 = 10**

Q no.	Question	CO	Level
a.	Evaluate the vulnerabilities of wireless communication interfaces in IoT systems. Propose a robust security framework to mitigate these risks.	4	K_2
b.	Design a system for visualizing sensor data on ThingSpeak using webhook services. How would you enhance the system to provide actionable insights for industrial use?	4	K_2

7.   Attempt any *one* part of the following: **10 x 1 = 10**

Q no.	Question	CO	Level
a.	Analyze the environmental implications of IoT product manufacturing. Propose strategies for sustainable production and end-of-life management.	5	K_2
b.	Discuss the transition process from an IoT prototype to a mass-produced product. What are the technical, financial, and logistical hurdles, and how can they be overcome?	5	K_2