Homework-01 – After mid

Embedded IOT Systems Fall2025

CS(A-B) AI 5th

Question-1 ESP32 Webserver (webserver.cpp)

Part A: Short Questions

1. What is the purpose of WebServer server(80); and what does port 80 represent?
2. Explain the role of server.on("/", handleRoot); in this program.
3. Why is server.handleClient(); placed inside the loop() function? What will happen if it is removed?
4. In handleRoot(), explain the statement:
server.send(200, "text/html", html);
5. What is the difference between displaying last measured sensor values and taking a fresh DHT reading inside handleRoot()?

Part B: Long Question

Describe the complete working of the ESP32 webserver-based temperature and humidity monitoring system.

Your answer should include:
- ESP32 Wi-Fi connection process and IP address assignment
- Web server initialization and request handling
- Button-based sensor reading and OLED update mechanism
- Dynamic HTML webpage generation
- Purpose of meta refresh in the webpage
- Common issues in ESP32 webserver projects and their solutions

Question-2 Blynk Cloud Interfacing (blynk.cpp)

Part-A: Short Questions

1. What is the role of Blynk Template ID in an ESP32 IoT project? Why must it match the cloud template?
2. Differentiate between Blynk Template ID and Blynk Auth Token.
3. Why does using DHT22 code with a DHT11 sensor produce incorrect readings? Mention one key difference between the two sensors.
4. What are Virtual Pins in Blynk? Why are they preferred over physical GPIO pins for cloud communication?
5. What is the purpose of using BlynkTimer instead of delay() in ESP32 IoT applications?

Part-B: Long Question

Explain the complete workflow of interfacing ESP32 with Blynk Cloud to display temperature and humidity values.

Your answer should include:
- Creation of Blynk Template and Datastreams
- Role of Template ID, Template Name, and Auth Token
- Sensor configuration issues (DHT11 vs DHT22)
- Sending data using Blynk.virtualWrite()
- Common problems faced during configuration and their solutions

Submission Guidelines

- Submit your assignment in PDF format here, and also in the GitHub repository.
- The submission must include a clear description written in your own words.
- Attach screenshots (in pdf file) of the Blynk Cloud (web) and Blynk mobile app dashboards, which you have already created during class.
- Copied content from any source is strictly prohibited. Any student found submitting plagiarized material will be dealt with strictly according to university policy.
- Viva is mandatory and will be conducted for awarding marks.
- The last date of submission is Wednesday, 17th December.