18 NOV 2025 BE ELECTRICAL SEM-VII C SCHEME IOT QP CODE: 10097146

(Time: 3 Hours) **[Total Marks: 80]**

N.B.: (1) Question No. 1 is **Compulsory**.
(2) Attempt any **three** questions out of the remaining **five**.
(3) Each question carries 20 marks and sub-question carry equal marks.
(4) Assume suitable data if required.

1. Attempt any **FOUR** of the following (Each question carry 5 Marks)
   (a) Write a short note on the real-world design constraints while designing IoT system. (5)
   (b) List various cloud based IOT platforms and explain any one in detail. (5)
   (c) What is the purpose of position and localization in IoT? Discuss in brief. (5)
   (d) Compare IoT and Industrial IoT (IIoT). (5)
   (e) Develop an LED blinking program using Arduino with an external LED connected to one of the digital pins. Write the code and provide the circuit connections clearly. (5)

2. (a) List and explain the characteristics of IoT. (10)
   (b) Explain in detail the functional block diagram of IoT. (10)

3. (a) What are the different communication models used in IoT? Explain any one in detail. (10)
   (b) What is the role of IoT operating systems in IoT? Briefly describe some of the popular IoT operating systems. (10)

4. (a) Explain working of MQTT with neat diagram and suitable examples. Highlight the role of publishers and subscribers. (10)
   (b) Explain Zigbee and Z-wave protocols. List supported topologies and examples of real-world applications where these protocols are used. (10)

5. (a) Explain Bluetooth BLE. How is BLE different than classical Bluetooth? (10)
   (b) Explain protocol stack of mobile app for IoT. (10)

6. (a) Draw and explain system design diagram of a home automation system using IoT to control devices like light, TV, house climate and home appliances. Explain with respect to the software, hardware, sensors, protocols, and platforms used to design this system. (10)
   (b) Design a smart irrigation system using IoT. Draw its block diagram, list down the sensors, actuators, micro-controllers to be used. (10)

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