Eighth Semester B.E. Degree Examination, Jan./Feb. 2023
Internet of Things Applications

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a.   Define IoT. With a neat diagram discuss the genesis of IoT in detail.   (05 Marks)
    b.   Discuss the different challenges of IoT.   (05 Marks)
    c.   Explain the One M2M IoT architecture with a neat diagram.   (10 Marks)

OR

2   a.   Describe the IoTWF standardized architecture in detail with a diagram.   (10 Marks)
    b.   Explain the concept of IoT Data management and Compute Stack with Fog Computing using relevant diagrams.   (05 Marks)
    c.   List out the defining characteristics of Fog Computing.   (05 Marks)

Module-2

3   a.   With a neat diagram explain how the actuators and sensors interact with the physical world. Classify the actuators based on energy types.   (08 Marks)
    b.   Explain the physical layer frame format, MAC layer frame format and security implementation in IEEE 802.15.4 technology.   (12 Marks)

OR

4   a.   Briefly discuss the various communication criteria.   (06 Marks)
    b.   Explain LoRaWAN architecture and MAC layer frame format with neat diagrams. (10 Marks)
    c.   Explain briefly the 4 defining characteristics of smart objects.   (04 Marks)

Module-3

5   a.   Explain in detail the key advantages of IP.   (08 Marks)
    b.   Explain the following with respect to 6LoWPAN technology:
         i)   Header Stacks
         ii) Header Compression
         iii) Fragmentation
         iv) Mesh Addressing   (12 Marks)

OR

6   a.   Explain MQTT framework and message format with neat diagrams.   (08 Marks)
    b.   Explain in detail CoAP communication in IoT infrastructure, CoAP message frame format and a suitable example to demonstrate reliable transmission with relevant diagrams.   (12 Marks)

Module-4

7   a.   Explain in detail the core functions of Edge streaming analytics with neat diagrams.   (08 Marks)
    b.   Describe the different types of data analysis results with a neat diagram.   (06 Marks)
    c.   Explain Lambda architecture with a neat diagram.   (06 Marks)

OR

8 a. Explain in detail the Purdue Model for Control Hierarchy and OT Network characteristics with a neat diagram. **(10 Marks)**
   b. Discuss OCTAVE and FAIR formal risk Analysis structures with neat diagrams. **(10 Marks)**

Module-5

9 a. Explain the different of pin parts of Arduino UNO board with a diagram. **(06 Marks)**
   b. Explain Smart City Parking Architecture with a neat diagram. **(08 Marks)**
   c. Explain the structure of an Arduino program. **(06 Marks)**

OR

10 a. Write a program to blink an LED using Raspberry Pi. **(08 Marks)**
    b. Explain Smart City IoT Architecture with a neat diagram. **(12 Marks)**

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