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## Eighth Semester B.E. Degree Examination, July/August 2022 Internet of Things

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. What is Internet of Things (IoT)? Explain Genesis of IoT, with a neat diagram. (08 Marks)
- b. Compare IT and OT Networks with different criterion. (08 Marks)
- c. Explain different challenges faced by IoT. (04 Marks)

**OR**

- 2 a. Explain One M2M IoT Standardized Architecture, with a neat diagram. (10 Marks)
- b. What is a Fog Node? Explain characteristics of Fog Computing Model. (05 Marks)
- c. Illustrate various access technologies with respect to distances in core IoT functional stack. (05 Marks)

### Module-2

- 3 a. Explain any 5 ways to group sensors into different categories. (05 Marks)
- b. List any two advantages of Wireless based solution. Illustrate with a neat diagram, the interaction of Sensors and Actuators, with the Physical World. (07 Marks)
- c. What is a Smart Object? Explain its characteristics. (08 Marks)

**OR**

- 4 a. Explain the following key factors involved in connecting smart objects to the network : (10 Marks)
- i) Range      ii) Frequency bands.
- b. Explain IEEE 802.15.4 IoT Access technology. (10 Marks)

### Module-3

- 5 a. Explain the key advantages of IP suite for IoT. (05 Marks)
- b. Explain 6 LOWPAN Protocol Header Compression and Fragmentation, with a neat diagram. (08 Marks)
- c. Illustrate Routing Protocol for Low Power and Lossy Networks (RPL), with a neat diagram. (07 Marks)

**OR**

- 6 a. Explain the message format of the following protocols with a neat diagram : (10 Marks)
- i) Constrained Application Protocol (CoAP).
- ii) Message Queuing Telemetry Transport (MQTT).
- b. Describe the Scheduling Management Mechanisms and forwarding Models and Supported by 6 TiSCH. (10 Marks)

### Module-4

- 7 a. Explain different types of Data Analysis results with example. (08 Marks)
- b. Distinguish between Supervised and Unsupervised Machine Learning. (05 Marks)
- c. Explain Elements of Hadoop, with a neat diagram. (07 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. What is Apache Spark? Explain layers in Lambda Architecture, with a neat diagram. (10 Marks)
- b. Explain OCTAVE Allegro steps and phases, with a neat diagram. (10 Marks)

**Module-5**

- 9 a. Explain the following with respect to Arduino Programming :
- i) Structures    ii) Functions    iii) Variables    iv) Flow control statements (10 Marks)
- v) Data type with example.
- b. Explain the steps to install operating system in the SD card of Raspberry Pi. Write a Python program to blink on LED. (10 Marks)

OR

- 10 a. Explain Key Verticals targeted in Smart Cities, with a neat diagram. (10 Marks)
- b. Explain Smart City IoT Architecture, with a neat diagram. (10 Marks)

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