

18CS81

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 :
i) Range ii) Frequency bands. (10 Marks)
- 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 :
i) Constrained Application Protocol (CoAP).
ii) Message Queuing Telemetry Transport (MQTT). (10 Marks)
- 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)

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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)

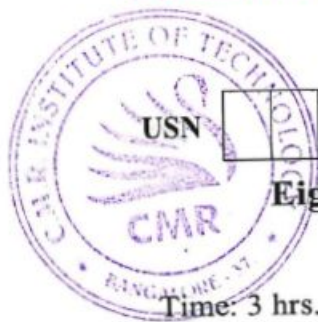
Module-5

- 9 a. Explain the following with respect to Arduino Programming :
i) Structures ii) Functions iii) Variables iv) Flow control statements
v) Data type with example. (10 Marks)
- 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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CBCS SCHEME

17CS81

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

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 IOT? Explain evolutionary phases of the Internet. (08 Marks)
- b. What are the different challenges of IOT? (07 Marks)
- c. Explain the drivers behind new network architecture. (05 Marks)

OR

- 2 a. With a neat diagram, explain one M2M architecture of IOT. (08 Marks)
- b. Explain Core IOT functional stack. (07 Marks)
- c. Compare and contrast IT and OT. (05 Marks)

Module-2

- 3 a. With a neat diagram, explain how actuators and sensors interact with Physical World. Classify actuators based on energy type. (10 Marks)
- b. Explain briefly the Wireless Sensor Network (WSN) and its Communication Protocols. (10 Marks)

OR

- 4 a. Briefly explain protocol stack utilization of IEEE 802.15.4. (10 Marks)
- b. Explain LoRaWAN standard and alliance MAC layer and security. (10 Marks)

Module-3

- 5 a. Explain 6LoWPAN protocol header compression and fragmentation in detail. (10 Marks)
- b. Explain 6TiSCH architecture in detail. (10 Marks)

OR

- 6 a. Explain Tunneling legacy SCADA over IP networks and SCADA protocol translation with a neat diagram. (10 Marks)
- b. Explain MQTT framework and message format in detail. (10 Marks)

Module-4

- 7 a. Explain the elements of Hadoop with a neat diagram. (10 Marks)
- b. Explain the core functions of edge analytics, with necessary diagram. (10 Marks)

OR

- 8 a. Explain the different components of FNF. (08 Marks)
- b. Describe Distributed Analytics Systems. (07 Marks)
- c. Describe Network Analytics. (05 Marks)

Module-5

- 9 a. Explain the different pins/parts of Arduino UNO Board. (10 Marks)
- b. With a neat diagram, explain the Wireless Temperature Monitoring System with Raspberry Pi. (10 Marks)

OR

- 10 a. Write a Python program on Raspberry Pi to blink an LED. (10 Marks)
- b. Explain Smart City Security Architecture in detail. (10 Marks)

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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.