



USN

--	--	--	--	--	--	--	--	--	--

15CS81

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

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Explain in detail the Genesis of IoT. (08 Marks)
- b. Explain the different challenges of IoT. (06 Marks)
- c. Define IT and OT. (02 Marks)

OR

- 2 a. Explain the expanded view of the simplified IoT architecture with a neat diagram. (08 Marks)
- b. Explain IoT architectural drivers. (08 Marks)

### Module-2

- 3 a. Define Sensors and Actuators. (02 Marks)
- b. Explain various types of sensors with description and examples. (06 Marks)
- c. Define WSNs. List the limitations of smart objects in WSNs and mention the need of communication protocols for WSNs. (08 Marks)

OR

- 4 a. Explain IEEE 802.15.4 (i) Physical layer and (ii) MAC layer, with diagrams. (08 Marks)
- b. Explain LoRaWAN architecture and its MAC frame format. (08 Marks)

### Module-3

- 5 a. Explain the key advantages of Internet Protocol. (06 Marks)
- b. Explain 6LOWPAN header stacks, protocol header compression and fragmentation. (10 Marks)

OR

- 6 a. Design an IoT application involving IoT Data Broker for providing interoperability. (08 Marks)
- b. Develop an IoT application framework which uses the temperature and pressure sensors in publish/subscribe module using MQTT. (08 Marks)

### Module-4

- 7 a. Define:
  - (i) Structured versus unstructured data (02 Marks)
  - (ii) Data in motion versus data at rest (02 Marks)
  - (iii) IoT data analytics overview. (04 Marks)
- b. Explain the Hadoop distributed file system with a neat diagram. (08 Marks)

OR

- 8 a. Explain the Purdue Model for control hierarchy. (08 Marks)
- b. Explain the risk assessment framework for OCTAVE. (08 Marks)



15CS81

**Module-5**

- 9 a. Explain the details of Arduino programming. List the advantages and its applications. (10 Marks)  
b. Write a python program on Raspberry Pi to blink an LED. (06 Marks)

OR

- 10 a. Explain the smart city layered architecture with a neat diagram. (08 Marks)  
b. Explain connected street lightning solution with architecture. (08 Marks)

\* \* \* \* \*