U.S.N

# P.E.S. College of Engineering, Mandya - 571 401
*(An Autonomous Institution affiliated to VTU, Belagavi)*
**Third Semester, M. Tech - VLSI Design and Embedded System (MECE)**
**Semester End Examination; Jan. / Feb. - 2021**
**Internet of Things**

Time: 3 hrs | Max. Marks: 100

*Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

## UNIT - I

| | | | |
|---|---|---|---|
| 1 | a. | Mention the major components of IoT system and explain various functional units in an MCU that is embedded in an IoT device. | 6 |
| | b. | Describe the architectural four layer framework of a smart city application. | 7 |
| | c. | Outline the functions of M2M architectural domains and relationship of an M2M system with an IoT system. | 7 |
| 2 | a. | Define IoT and explain the analysis of IoT in terms of a suggested IoT conceptual framework. | 6 |
| | b. | Discuss the wireless communication technologies. | 7 |
| | c. | Discuss case of designing and affordability of IoT devices. | 7 |

## UNIT - II

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|---|---|---|---|
| 3 | a. | Explain with the help of neat figure the protocol layers and respective protocol at each layer. | 8 |
| | b. | Discuss the steps in Query Processing. | 5 |
| | c. | Explain different data generation. | 7 |
| 4 | a. | Discuss the following terms and their meaning used in IoT application layers: <br> i) Service Oriented Architecture (SOA) <br> ii) Business Transaction (BT) <br> iii) Key Value Pair (KVP) <br> iv) Query and Query processing | 8 |
| | b. | Explain in detail the SQL feature. | 5 |
| | c. | Discuss the architecture reference model for the business intelligence and business processes of ACPAMS. | 7 |

## UNIT - III

| | | | |
|---|---|---|---|
| 5 | a. | With the help of neat figure, explain different methods of data collection, storage and computing. | 8 |
| | b. | List and explain cloud deployment models. | 5 |
| | c. | Mention the essential features of cloud storage and computing. | 7 |

6 a. Explain the Radio Frequency Identification (RFID) technolgy. 8

b. Describe the uses of data communication using serial bus protocol. 5

c. Explain the Internet of connected car components for predictive and preventive maintenances of automobile by service center. 7

## UNIT - IV

7 a. With the help of neat figure, explain five levels for software development for applications and services for IoT or M2M. 8

b. Define the following terms:

 i) Software framework

 ii) Multitasking or Multithreading

 iii) Application framework 6

c. Explain the basic concepts of embedded systems. 6

8 a. Discuss with neat figure the microcontroller on-chip functional units and application specific units. 8

b. Mention the features of Intel Galileo. 6

c. List the differences on Arduino boards for IoT and wearable devices. 6

## UNIT - V

9 a. With the help of neat figure, explain the architectural layers in open HAB development environment. 8

b. Discuss the overview of an Internet connected car. 6

c. List the features of smart parking service. 6

10 a. With the help of neat figure, explain the case of a threat-analysis during a stride. 8

b. Mention the features of a smart irrigation monitoring service. 6

c. Explain the simple use case digram for generating and communicating a key. 6

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