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# B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## September / October 2023 Supplementary Examinations

**Programme: B.E.**

**Branch: Electronics and Communication Engineering**

**Course Code: 19EC6PE3IT**

**Course: Internet of Things**

**Semester: VI**

**Duration: 3 hrs.**

**Max Marks: 100**

**Date: 21.09.2023**

**Instructions:** 1. Answer any FIVE full questions, choosing one full question from each unit.  
2. Missing data, if any, may be suitably assumed.

### UNIT - I

1	a) Compare the Operational Technology and Information Technology networks and their various challenges.	07
	b) With a neat diagram explain the IoT standardized architecture.	08
	c) Differentiate IoT and Digitization	05

### UNIT - II

2	a) Compare LoRaWAN, Sigfox, Ingenu Onramp which are the competitors under unlicensed LPWA Technology	10
	b) Define Sensors. Classify and describe the sensors based on its applications giving some examples	10

### UNIT - III

3	a) What is SCADA? How do you adapt SCADA for IP? Sketch its protocol stack for transporting protocols over IP.	10
	b) Compare the IoT Protocol Stack Utilizing 6LoWPAN and IP Protocol Stack. Illustrate the Optimizing IP for IoT using an adaptation layer.	10

### OR

4	a) Assume different kinds of temperature data in varying formats are considered, Illustrate the role of IoT Data Broker in detail	10
	b) Sketch the MQTT Message format and describe each field in detail	10

### UNIT - IV

5	a) What is IoT data analytics? Describe its challenges.	06
	b) With the help of a Massively Parallel Processing Database architecture, explain its operation and characteristics in detail	06

**Important Note:** Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

c) Explain the Lambda Architecture with the help of a block diagram. Mention its merits and demerits. **08**

**OR**

6 a) Compare Big Data and Edge Analytics **06**

b) Define OCTAVE and FAIR also mention their origin **06**

c) What is Apache Kafka? Illustrate the data flow from the smart objects (producers), through a topic in Kafka, to the real time processing engine. **08**

**UNIT - V**

7 a) Assume you are developing a smart city IoT infrastructure project. Since it's a layered architecture, propose, define and discuss the layers involved. **10**

b) Mention the features of Arduino UNO and Raspberi Pi **10**

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