Total No. of Questions : 8]

SEAT No. : [ ]

P-7541

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[6180]-49

T.E. (Computer Engineering)

INTERNET OF THINGS AND EMBEDDED SYSTEMS

(2019 Pattern) (Semester - I) (Elective - I) (310245(A))

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Assume suitable data if necessary.***

Q1) a) Explain the steps involved in the IoT design methodology. **[6]**

b) Explain the concept of Machine-to-Machine (M2M) communication in the context of IoT. **[6]**

c) Illustrate the different pillars of IoT. **[6]**

OR

Q2) a) Identify and explain the key components of an IoT network architecture. **[6]**

b) Demonstrate the Web socket API with suitable IoT system. **[6]**

c) Discuss the advantages and limitations of using IoT communication APIs in home automation systems. **[6]**

Q3) a) Analyze the characteristics and functionalities of M2M protocols used in IoT applications. **[6]**

b) Analyse the Modbus protocol and its usage in industrial IoT applications. Discuss the features and functionalities of Modbus, its communication modes, and the benefits it offers in connecting devices in industrial automation. **[6]**

c) Analyse the working principles and applications of the RFID protocol in IoT system. **[5]**

P.T.O.

OR

Q4) a) Classify between M2M and SCADA Protocol with proper example. **[6]**

b) Demonstrate the use of IP based protocols in the IoT Applications. **[6]**

c) Show the use of LoRa protocol in the smart irrigation system development. **[5]**

Q5) a) Examine how Cloud Computing is an IoT enabling technology with the suitable applications. **[8]**

b) Design a cloud storage model for an IoT-based healthcare application. Consider the storage requirements, data security, and privacy concerns associated with sensitive patient health records. Discuss the pros and cons of using public, private, and hybrid cloud storage options. **[10]**

OR

Q6) a) Show that Cloud computing is the fusion of Grid Computing and SOA. **[8]**

b) Design a home automation system using the AutoBahn for IoT and Xively Cloud for IoT communication APIs. Discuss how these APIs can be used to enable device control, data collection, and remote monitoring of various home appliances and sensors. **[10]**

Q7) a) Design an introduction to IoT security, highlighting the unique challenges and vulnerabilities associated with IoT deployment. **[8]**

b) Illustrate the challenges in securing IoT applications. **[9]**

OR

Q8) a) Predict the possible vulnerabilities in designing smart home intrusion detection system. **[8]**

b) Design a case study on designing a secure IoT home intrusion detection system. Identify the challenges and considerations involved in ensuring the confidentiality, integrity, and availability of data, as well as the timely detection and response to potential security breaches. **[9]**