Code No: 156FE **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, August/September - 2024
IOT COMMUNICATION PROTOCOLS
(Computer Science and Engineering - IOT)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) How does the Internet of Things differ from Internet-controlled devices? Give examples for your answer. [2]
b) Why does a WSN node need self-discovering, self-configuring and self-healing characteristics for networking? [3]
c) What are the three most important kinds of Device types for the IoT Domain Model. [2]
d) Plot the architecture of IoT Reference Model. [3]
e) Differentiate the Bluetooth Low Energy, and Zigbee Smart Energy. [2]
f) What are the WPAN and network protocol functions which can be used for Internet of RFIDs? [3]
g) Compare the direct device connectivity and indirect device connectivity topologies of LPWAN. [2]
h) Write the communication protocols used in IoT environment. [3]
i) What are the Constrained Applications protocol (CoAP). [2]
j) Compare the TLS, and DTLS. [3]

PART – B

(50 Marks)

2.a) Explain the fundamental Characteristics of IoT.
b) How does the IoT model relate to the OSI seven-layer model for computer networks? Provide the role of each layer in IoT Model. [5+5]

OR

3.a) What is an interface? List out the interfaces of an IoT. Why the interfaces play a major role in IoT device communication?
b) What are transducers? Explain how they are related to sensors and actuators. [5+5]

4.a) Explain the relationship between core concepts of IoT Domain Model and IoT Information Model.
b) Discuss the Operational View of IoT Reference Architecture. [5+5]

OR

5.a) Describe the Technical Design constraints of IoT Reference Architecture.
b) Illustrate the information View of IoT Reference Architecture. [5+5]

6.a) Explain an application scenario where Zigbee is suitable over Bluetooth, LoRa and NFC.

b) Draw and show how a cellular network will connect to a ZigBee mesh network. [5+5]

OR

7.a) Why are the data aggregation, compaction and fusion needed before transmitting data from a WSN gateway and cluster head? Explain.

b) How do ZigBee end point devices form a WPAN of embedded sensors, actuators, appliances, controllers or medical data systems, and how do they connect to application layer services, business processes and service? Explain. [5+5]

8.a) How is 6LowPAN different from IPV6? Explain Bluetooth protocol architecture.

b) Compare the IoT Network Layer Protocols 6LoWPAN, and 6TiSCH. [5+5]

OR

9.a) Illustrate the model of CARP and explain its working principles.

b) Compare the IoT Network Layer Protocols CORPL, and RPL. [5+5]

10.a) Illustrate the object exchanges between devices, CoAP-MQ Broker and web applications.

b) Explain how XMPP is used for IoT applications. [5+5]

OR

11.a) Compare the Architecture and the working principles of the IoT Transport Layer Protocols DCCP, and SCTP.

b) Compare the Architecture and the working principles of the IoT Session Layer Protocols AMQP, and MQTT. [5+5]

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