PAPER ID-310920

Roll No:

BTECH
(SEM V) THEORY EXAMINATION 2024-25
IOT ARCHITECTURE AND PROTOCOLS

TIME: 3 HRS   **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1.   **Attempt *all* questions in brief.**   **2 x 07 = 14**

Q no.	Question	CO	Level
a.	Why are standards important in designing IoT architectures?	1	K2
b.	Explain the relationship between M2M analytics and IoT knowledge management.	1	K2
c.	What is the significance of the IoT reference model in IoT system design?	2	K2
d.	What are the key differences between IPv4 and IPv6, and why is IPv6 considered more suitable for IoT networks?	3	K2
e.	Explain the role of Zigbee Smart Energy in IoT.	3	K1
f.	What is the purpose of TLS in IoT communication?	4	K1
g.	Discuss how security protocols at the Application Layer contribute to securing data in IoT systems.	5	K2

SECTION B

2.   **Attempt any *three* of the following:**   **07 x 3 = 21**

a.	Discuss the importance of standards in IoT architectures. How do standards ensure interoperability and security?	1	K2
b.	Describe the IoT reference model and explain its role in standardizing IoT systems. How does it address interoperability and integration challenges across different IoT applications?	2	K3
c.	Compare and contrast ZWave and Bluetooth Low Energy (BLE) in the context of IoT networks. Discuss their strengths and weaknesses, particularly in terms of range, power consumption, and use cases.	3	K3
d.	Explain the role of the Transport Layer in IoT communication. Discuss the differences between TCP and UDP, highlighting their advantages and limitations for IoT applications.	4	K2
e.	Explain how 6LoWPAN (IPv6 over Low Power Wireless Personal Area Networks) works and its importance in IoT networks. How does it address the challenges of low-power and low-bandwidth communication while ensuring security?	5	K3

SECTION C

3.   **Attempt any *one* part of the following:**   **07 x 1 = 07**

a.	Compare local and wide-area networking in IoT systems. Discuss their advantages and limitations with examples.	1	K3
b.	Describe how "Everything as a Service (XaaS)" is transforming IoT business models. Provide examples of XaaS offerings in the IoT domain.	1	K2

4.   **Attempt any *one* part of the following:**   **07 x 1 = 07**

a.	Describe the real-world design constraints in IoT systems. Discuss the factors that influence the design choices and how they impact the deployment of IoT systems in practical scenarios.	2	K2

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b.	Discuss the importance of data representation and visualization in IoT systems. How does effective data representation aid in decision-making, system monitoring, and user interaction?	2	K3

5. **Attempt any *one* part of the following:**   **07 x 1 = 07**

a.	Describe the RPL protocol and its significance in routing for IoT networks. Discuss how RPL addresses scalability and energy efficiency, especially in low-power and low-data-rate IoT applications.	3	K2
b.	Describe the DASH7 protocol. What makes it ideal for low-power IoT applications, and in which industries or environments is it most commonly used?	3	K3

6. **Attempt any *one* part of the following:**   **07 x 1 = 07**

a.	Compare and contrast CoAP (Constrained Application Protocol) and HTTP. Discuss why CoAP is a better choice for resource-constrained IoT devices and low-power networks.	4	K3
b.	Discuss SCTP (Stream Control Transmission Protocol) and its features. How does SCTP enhance the reliability and performance of communication in IoT systems, especially in multi-stream scenarios?	4	K2

7. **Attempt any *one* part of the following:**   **07 x 1 = 07**

a.	Discuss end-to-end security in IoT systems. How can security be implemented across the service layer and application layer to ensure the protection of sensitive data from devices to servers in IoT ecosystems?	5	K3
b.	What is the role of the OMA (Open Mobile Alliance) in IoT service layers? Discuss how OMA protocols enhance the integration of IoT devices into existing mobile networks and services.	5	K2