

Hall Ticket Number:

R23

--	--	--	--	--	--	--	--	--	--

KAMALA INSTITUTE OF TECHNOLOGY & SCIENCE, SINGAPUR

23EC28PC502

III B. Tech. I Semester Regular Examinations, November-2025

IOT ARCHITECTURES AND PROTOCOLS

(ECE)

Time: 3 Hours

Max. Marks: 60

Note: Question paper consists of Part-A & Part-B.

i) **Part-A** for 10M, ii) **Part-B** for 50marks

- **Part A** is compulsory, consists of 10 sub questions from all units carrying equal marks.
- **Part-B** consists of **10 questions** (numbered from 2 to 11) carrying **10marks** each. From each unit there are 2 questions and the students should answer one of them. Hence the student should answer **5 questions** from **Part-B**.

PART-A (10Marks)			
Q. No	Questions	Marks	BTL
1.a)	Mention any two application areas of IoT.	1	1
1.b)	Give any two characteristics of IoT.	1	1
1.c)	What is the purpose of 'Application Layer' in Core IoT functional stack?	1	1
1.d)	What is the significance of 'Abstraction Layer' in comparing different IoT Architectures?	1	1
1.e)	What are the primary functions of physical (PHY) layer in a wireless communication protocol?	1	1
1.f)	What IEEE standard forms the basis for the Wireless HART PHY layer and in which frequency band does it operate?	1	1
1.g)	List out the commonly used Transport layer protocols.	1	1
1.h)	Explain about DCCP.	1	2
1.i)	State the role of the Service layer in an IoT architecture.	1	1

1.j)	List the main functional blocks of the oneM2M common service layer.	1	1
PART-B (50Marks)			
Q.No.	Questions	Marks	BTL
2. a)	Discuss about the following in details: (i) Sensors and Actuators (ii) Connecting Smart objects	5M	2
b)	With a neat diagram explain the architecture of IoT and discuss IoT challenges.	5M	2
OR			
3. a)	Describe the IoT enabling techniques & M2M Communication with suitable explanations.	5M	2
b)	Explain the layered architecture of IoT (Perception, Network, Middleware, Application, and Business layers) with a neat diagram.	5M	2
OR			
4. a)	Describe Physical and MAC layer topology and security of IEEE 802.15.4.	5M	2
b)	Explain the transition from Machine-to-Machine (M2M) Communication to the Internet of Things (IoT) highlighting technological advancements.	5M	2
OR			
5. a)	Identify and elaborate on the key components necessary for Comprehensive IoT architecture.	5M	2
b)	Analyze the roles of Software Defined Networking (SDN) and Network Function Virtualization (NFV) in Modern IoT infrastructure.	5M	4
OR			
6. a)	Describe the PHY/MAC layer standards relevant to IoT — 3GPP MTC, IEEE 802.11, IEEE 802.15.	5M	2
b)	Compare IPv4 and IPv6 addressing mechanisms and explain why IPv6 is better suited for IoT.	5M	4
OR			
7. a)	Differentiate between RPL, CORPL, and CARP in terms of their routing mechanisms and applications in IoT.	5M	4

b)	What is 6LoWPAN? Explain its architecture, header compression, and adaptation features for IoT in brief.	5M	2
8. a)	Explain the role of the Transport Layer in IoT architecture. Discuss its importance in ensuring reliable and efficient data delivery between IoT devices.	5M	2
b)	Explain the User Datagram Protocol (UDP) and describe its suitability for IoT applications that require low latency and minimal overhead.	5M	2
OR			
9. a)	Explain how MPTCP and SCTP contribute to fault tolerance and reliability in IoT networks with multiple network paths or devices.	5M	2
b)	Discuss the role of AMQP (Advanced Message Queuing Protocol) in IoT systems. Explain its architecture, messaging model, and reliability features.	5M	2
10.a)	Compare and contrast the architectures and objectives of one M2M, ETSI M2M and the OMA's Light weight M2M protocol.	5M	5
b)	Explain the application layer protocols, CoAP and MQTT. Compare their communication models and discuss the security mechanisms available for each protocol	5M	2
OR			
11.a)	Describe the RPL protocol, explaining how it builds and maintains Destination-oriented Directed Acyclic graphs (DODAGs) for routing in Low-Power and Lossy Networks (LLNs).	5M	2
b)	Describe the oneM2M standardized architecture, explaining its horizontal layering approach and its importance for interoperability in the IoT eco system.	5M	2