PRANVEER SINGH INSTITUTE OF TECHNOLOGY, KANPUR

Even Semester Session 2023-24 Pre-University

B. Tech. VI Semester

IoT Architecture and Protocols (KOT-601)

CO Number	Course Outcome
CO-1	To **define (L1-Remember)** various parameters related to IoT architecture, IoT reference architecture and protocols related to IoT layers.
CO-2	To **explain (L2-Understand)** IoT based architecture, IoT reference architecture and protocols related to data link layers, network layer, transport layer, session layer, service layer and security layer.
CO-3	To **illustrate (L3-Apply)** the concept of IoT architecture and IoT reference architecture and to **examine (L4-Analyze)** various IoT application layer protocols.
CO-4	To **apply (L4-Analyze)** IP based protocols and different architecture of IoT in different layers.

Time: 3 Hrs. M. M. 100

Section A

Q1. Attempt all questions: (2x10 =20 Marks)

a) Draw IoT architectural outline. CO1

b) Explain Everything as a Service (XaaS). CO2

c) Explain various views in IoT reference model architecture with labelled diagram. CO2

d) Explain 3GPP MTC. CO2

e) Describe the making process of HC-05 Bluetooth module in master and slave configuration. CO2

f) Differentiate between TCP and UDP. CO2

g) Explain session layer and list all its protocols. CO2

h) Explain Constrained Application Protocol (CoAP). CO2

i) Define oneM2M interface. CO1

j) Describe functions related to application layer in OSI model. CO2

Section B

Q2. Attempt all questions. (10x3 = 30 Marks)

a) Summarize the following IoT protocols associated with different layers of IoT. CO3
i) ZWave ii) Wireless HART iii) 6LoWPAN iv) CoAP

b i) Describe transmission control protocol (TCP) in detail with relevant features, advantages and disadvantages. CO2

OR

ii) Describe user datagram protocol (UDP) and datagram congestion control protocol (DCCP) in detail with relevant features, header, advantages and disadvantages. CO2

c i) Illustrate the following protocols. CO3
a) IPv6 b) AMQP c) TLS d) RPL

OR

ii) Distinguish IEEE 802.11 and IEEE 802.15 with relevant features, advantages and disadvantages. CO3

Section C

Q3. Attempt all questions: **(10X5 = 50 Marks)**

a i)	Illustrate the use of LAN and WAN used in IoT infrastructure. Also, differentiate between LAN and WAN.	**CO3**
	OR	
ii)	Illustrate the use of devices and gateways in the context with M2M and IoT technology fundamentals.	**CO3**
b i)	Examine IoT reference model architecture with proper diagram. Explain the relationships of reference models, architectural patterns, reference architectures, and software architectures.	**CO4**
	OR	
ii)	Examine smart parking system with parking IoT deployment and operational view in context with IoT reference architecture.	**CO4**
c i)	Describe BLE and explain frames associated with BLE taking the example of interfacing two Bluetooth modules in master and slave configuration clearly mentioning the circuit diagram and code for home automation.	**CO2**
	OR	
ii)	Explain ZigBee smart energy. Also, explain the process of interfacing two ZigBee modules with Arduino code and circuit diagram.	**CO2**
d i)	Illustrate the process of making web server using HTTP protocol for four channel home automation.	**CO3**
	OR	
ii)	Illustrate the connection process of Blynk server for MQTT protocol. Also, explain the use of publish-subscribe model using MQTT client and broker.	**CO3**
e i)	Explain detailed architecture view of ETSI M2M associated with service layer taking the example of android application based relay control system mentioning its code and circuit diagram.	**CO2**
	OR	
ii)	Explain the following in detail- a) MAC 802.15.4 b) Application Layer	**CO2**