



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

COMPUTER SCIENCE AND ENGINEERING

DEFINITIONS AND TERMINOLOGY

Course Name	:	INTERNET OF THINGS
Course Code	:	ACS510
Program	:	B.Tech
Semester	:	VI
Branch	:	Computer Science and Engineering
Section	:	A,B,C,D
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COURSE OBJECTIVES(COs):

The course should enable the students to:	
I	Understand the architecture of Internet of Things and connected world.
II	Explore on use of various hardware and sensing technologies to build IoT applications.
III	Illustrate the real time IoT applications to make smart world.
IV	Understand the available cloud services and communication API,,s for developing smart cities.

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S No	QUESTION	ANSWER	Blooms Level	CLO	CO	CLO Code
UNIT - I						
1	Define IoT.	IoT is connecting things to the internet and allow things to communicate and exchange data.	Remember	CLO1	CO1	ACS510.01
2	Define Self adapting characteristics of IoT	IoT devices and systems may have the capability to dynamically adapt with the changing contexts and take actions based on their operating conditions, user's context or sensed environment.	Remember	CLO1	CO1	ACS510.01
3	Define Self configuring characteristics of IoT	Allowing a large number of devices to work together to provide certain functionality	Remember	CLO1	CO1	ACS510.02
4	Define interoperable characteristics of IoT	support a number of communication protocols and can communicate with other devices and also with infrastructure.	Remember	CLO1	CO1	ACS510.03
4	What is Unique ID of things of IoT ?	IP address or MAC address	Remember	CLO1	CO1	ACS510.02
5	Define Integrated into Information Network characteristics of IoT.	That allow to communicate and exchange data with other devices and systems	Remember	CLO1	CO1	ACS510.02
6	How IoT devices interfaces are connected?	An IoT device may consist of several interfaces for communication to other devices both wired and wireless	Understand	CLO1	CO1	ACS510.02
7	What are different I/O interfaces for sensors in IoT?	UART, SPI, I2C, CAN	Remember	CLO1	CO1	ACS510.02
8	Expand the term UART	Universal Asynchronous Receiver/Transmitter	Remember	CLO1	CO1	ACS510.02
9	Define I2C protocol.	The I2C is a serial bus protocol consisting of two signal lines such as SC Land SDL lines which are used to communicate with the devices.	Remember	CLO1	CO1	ACS510.02
10	Expand the term SPI	Serial Peripheral Interface	Remember	CLO1	CO1	ACS510.02
12	Expand the term CAN	Controller Area Network	Remember	CLO1	CO1	ACS510.02

13	What are different connectivity interfaces for sensors in IoT?	USB Host and RJ45/Ethernet	Remember	CLO1	CO1	ACS510.04
14	What are different audio/video interfaces for sensors in IoT?	HDMI, 3.5mm audio and RCA video	Remember	CLO1	CO1	ACS510.02
15	What are different storage interfaces for sensors in IoT?	SD, MMC and SDIO	Remember	CLO1	CO1	ACS510.02
16	What are different memory interfaces for sensors in IoT?	NAND/NOR and DDR1/DDR2/DDR3	Remember	CLO1	CO1	ACS510.02
17	Expand the term MQTT	Message Queue Telemetry Transport	Remember	CLO1	CO1	ACS510.04
18	Expand the term CoAP	Constrained Application Protocol	Remember	CLO1	CO1	ACS510.04
19	Expand the term XMPP	Extensible Message and Presence Protocol	Understand	CLO1	CO1	ACS510.04
20	Expand the term AMQP	Advanced Message Queuing Protocol	Understand	CLO1	CO1	ACS510.04
21	What is Network?	It is collection of connecting devices via media.	Remember	CLO1	CO1	ACS510.01
22	How networks are connected	Networks are connected by different types of interfaces.	Remember	CLO1	CO1	ACS510.01
23	Write the purpose of networks?	The main purpose of network is to transfer the data or information from one machine to other machine.	Remember	CLO1	CO1	ACS510.01
24	What is the use of Sensor?	A sensor is play major role in networks by sensing or actuating its surroundings and passes the data to its server system.	Remember	CLO1	CO1	ACS510.02
25	Define the function of Actuator?	An actuator that introduces motion by converting electrical energy into mechanical energy in an electromechanical system.	Remember	CLO1	CO1	ACS510.02
26	What is the meaning of IoT?	A dynamic global network infrastructure with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual "things" have identities, physical attributes, and virtual personalities and use intelligent interfaces, and are seamlessly integrated into the information network, often communicate data associated with users and their environments.	Remember	CLO1	CO1	ACS510.03

27	Write the Characteristics of IoT.	It is combination of various characteristics, there are dynamic and self-adapting, self configuring, inter operable communication protocols and unique identity.	Remember	CLO1	CO1	ACS510.01
28	What is meaning of Thing in IOT system.	A thing in IoT refers devices which have a unique identity and it can perform remote sensing, actuating and monitoring capabilities.	Remember	CLO1	CO1	ACS510.01
29	What are components in IoT system?	The IoT system contains the various components. 1.Device 2.Resource 3.Controller-service 4.Web-service 5.Database 6.Analysis component 7.Application	Understand	CLO1	CO1	ACS510.10
30	Write the importance Cloud Computing in IoT.	Cloud computing is an approach where information technology capacities are separated from the individual computer and are supplied through the Internet at the user's demand.	Remember	CLO2	CO1	ACS510.06
31	List out the IoT protocols.	The IoT system maintains different protocols in different layer of the system. In link layers are Ethernet (802.3), Wi-Fi(802.11), Wimax(802.16), in Internet layers are IPv4,IPv6,in Application layers are HTTP,XMPP,DDS and Websocket.	Remember	CLO2	CO1	ACS510.06
32	What are differences between TCP and UDP?	TCP is connection oriented protocol, and UDP is connection less protocol.	Remember	CLO2	CO1	ACS510.06
33	What is the XMPP?	Extensible Messaging and Presence Protocol (XMPP) is a communication protocol for message-oriented middleware based on XML(Extensible Markup Language).	Remember	CLO2	CO1	ACS510.06
34	List out IOT functional blocks.	Devices, communication, management, services, security and application	Remember	CLO2	CO1	ACS510.06
35	Write any four domain specific applications of IOT?	Home applications, cities, environment and retail applications.	Remember	CLO2	CO1	ACS510.06
36	List out the components of IOT.	Device, resource, controller service, database, web services, analyze components and application.	Remember	CLO2	CO1	ACS510.06
37	Define device in IoT	The Internet of Things is the network of interrelated computing devices that provide sensing, actuation, monitoring and control functions.	Remember	CLO2	CO1	ACS510.01

38	List the components of an IoT system	An IoT system comprises of following components 1.Device 2.Resource 3.Controller- service 4.Web- service 5.Database 6.Analysis component 7.Application	Understand	CLO2	CO1	ACS510.01
39	List the differences between REST and Web socket services	The differences between REST and Web socket services are 1.Stateless/Stateful 2.Bi-directional/Uni-directional 3.Request-response /Full- Duplex 4.TCP connections 5. Header overhead 6 Scalability	Understand	CLO2	CO1	ACS510.02
40	State the purpose of CoAP protocol in application layer	Constrained Application Protocol (CoAP) is used for machine-to-machine (M2M) applications with constrained devices, constrained environment and constrained n/w. It uses client-server architecture.	Remember	CLO2	CO1	ACS510.03
41	List the capabilities of IoT functional blocks	IoT functional blocks provide the system with the capabilities of identification, sensing, actuation, communication and management.	Remember	CLO2	CO1	ACS510.03
42	State the purpose of request- response model used in IoT communication model	Client in Request-response model sends request to the server and the server replies to requests. It is a stateless communication model and each request- response pair is independent of others.	Understand	CLO2	CO1	ACS510.02
43	List the characteristics of IoT	Characteristics of IoT are 1. Dynamic & Self Adapting 2.Self Configuring 3.Inter Operable Communication Protocols 4.Unique Identity\ 5.Integrated into Information Network	Remember	CLO2	CO1	ACS510.01

S No	QUESTION	ANSWER	Blooms Level	CLO	CO1	CLO Code
44	List the protocols which are used in network/internet layer	Network layer is responsible for sending IP datagrams from source n/w to destination n/w. Performs the host addressing and packet routing. Datagrams contains source and destination address. Protocols are 1.IPv4 2. IPv6 3.6LowPAN	Remember	CLO 3	CO1	ACS510.03
45	Give some wireless communication protocols used in WSN	WSN's are enabled by wireless communication protocols such as IEE 802.15.4.Zigbee is one of the most popular wireless technologies used by WSN's	Understand	CLO 3	CO1	ACS510.02
46	What are the different cloud computing services offered to users ?	The different cloud computing services offered to users are 1.Infrastructure-as-a-Service 2.Platform-as-a-Service 3.Software-as-a-Service	Remember	CLO 3	CO1	ACS510.02
47	Define web socket based communication API	Web Socket APIs allow bi-directional, full duplex communication between clients and servers. Web Socket APIs follow the exclusive pair communication model.	Remember	CLO 3	CO1	ACS510.03
48	Define REST based Communication API	Representational State Transfer(REST) is a set of architectural principles by which we can design web services and web APIs that focus on a system's resources and have resource states are addressed and transferred.	Understand	CLO 3	CO1	ACS510.03
49	List the constraints of REST	The constraints of REST Client-Server are 1.Stateless 2.Cache-able 3.Layered System 4.User Interface 5.Code on Demand	Understand	CLO 3	CO1	ACS510.03
50	What is the purpose of exclusive pair model in IoT communication model?	Exclusive pair model is bi-directional, full duplex communication model that uses a persistent connection between the client and server. Once connection is set up it remains open until the client send a request to close the connection. It is a stateful communication model and server is aware of all the open connections.	Understand	CLO 3	CO1	ACS510.02

S No	QUESTION	ANSWER	Blooms Level	CLO	CO	CLO Code
51	State the purpose of push- pull model used in IoT communication model	Push-pull model allows producers to push data to queues and consumers pull data from the queues. Producers do not need to aware of the consumers. Queues help in decoupling the message between the producers and consumers.	Remember	CLO4	CO1	ACS510.02
52	Define device in IoT	The Internet of Things is the network of interrelated computing devices that provide sensing, actuation, monitoring and control functions.	Remember	CLO4	CO1	ACS510.01
53	Define Data ?	Raw and unprocessed data obtained from IoT devices or systems.	Remember	CLO4	CO1	ACS510.01
54	Define Information?	Information is inferred from data by filtering, processing, categorizing, condensing and contextualizing .	Remember	CLO4	CO1	ACS510.01
55	Define Knowledge?	Knowledge is inferred from information by organizing and structuring.	Remember	CLO4	CO1	ACS510.01
56	Define Sensor?	A device used to measure a specific characteristic of the surrounding environment, such as temperature, humidity, etc.	Remember	CLO4	CO1	ACS510.02
57	Define Actuator?	A device that introduces motion by converting electrical energy into mechanical energy in an electromechanical system.	Remember	CLO4	CO1	ACS510.02
58	Define IoT?	A network of objects (such as sensors and actuators) that can capture data autonomously and self-configure intelligently based on physical world events, allowing these systems to become active participants in various public, commercial, scientific, and personal processes.	Remember	CLO4	CO1	ACS510.03
59	Define Big data?	It is defined as collection of data sets whose volume, velocity, variety is so large that is difficult to store, manage, process and analyze the data using traditional databases and data processing tools.	Remember	CLO4	CO1	ACS510.01
60	Define Cloud Computing?	An approach where information technology capacities (such as storage or applications) are separated from the individual computer and are supplied through the Internet (or an Intranet-based service) at the user's demand.	Remember	CLO4	CO1	ACS510.01
61	Compare TCP and UDP?	TCP (Transmission Control Protocol) is connection oriented, whereas UDP(User Datagram Protocol) is connection-less. This means that TCP tracks all data sent, requiring acknowledgment for each octet (generally). UDP does not use acknowledgments at all, and is usually used for protocols where a few lost datagrams do not matter.	Understand	CLO4	CO1	ACS510.10

S No	QUESTION	ANSWER	Blooms Level	CLO	CO	CLO Code
62	Write about Websocket protocol?	WebSocket enables bidirectional, message-oriented streaming of text and binary data between client and server.	Remember	CLO5	CO1	ACS510.06
63	Write about MQTT?	Message Queue Telemetry Transport .It is an open, lightweight M2M communications protocol for the transfer of telemetry messages.	Remember	CLO5	CO1	ACS510.06
64	Write about XMPP?	Extensible Messaging and Presence Protocol (XMPP) is a communication protocol for message-oriented middleware based on XML(ExtensibleMarkup Language).	Remember	CLO5	CO1	ACS510.06
65	Write about DDS?	Data distribution service is a data centric middleware standard for device to device or machine to machine communication.	Remember	CLO5	CO1	ACS510.06
66	Write about AMQP?	Advanced Message Queuing Protocol is an open-source standard for business message communication. Main features include message orientation, queuing, routing, reliability, and security.	Remember	CLO5	CO1	ACS510.06
67	Write about CoAP?	Constrained Application Protocol. This software protocol is used in small electronics devices and serves as the interactive communication between those devices.	Remember	CLO5	CO1	ACS510.06
UNIT – II						
1	What is synonymous to IoT?	Machine-to-Machine(M2M)	Remember	CLO6	CO2	ACS510.06
2	Define M2M.	Machine-to-Machine (M2M) refers to networking of machines(or devices) for the purpose of remote monitoring and control and data exchange	Remember	CLO6	CO2	ACS510.06
3	Which protocols provide connectivity between M2M nodes within an M2M area network?	ZigBee, Bluetooth, M-bus, Wireless M-Bus	Remember	CLO6	CO2	ACS510.08
4	M2M networks use which type of communication protocols?	Use either proprietary or non-IP based communication protocols.	Remember	CLO6	CO2	ACS510.07
5	What is the use of M2M gateway	M2M gateway performs protocol translations to enable Ip-connectivity for M2M are networks.	Remember	CLO6	CO2	ACS510.07
6	Machines in M2M will be of what type?	Machines in M2M will be homogenous	Remember	CLO6	CO2	ACS510.08

7	M2M data is used to solve which types of applications?	on-premises applications	Remember	CLO6	CO2	ACS510.08
8	IoT data is used to solve which types of applications?	cloud applications	Remember	CLO6	CO2	ACS510.06
9	Expand the term SDN	Software Defined Networking.	Remember	CLO6	CO2	ACS510.06
10	How Centralized Network controller works?	With decoupled control and data planes and centralized network controller, the network administrators can rapidly configure the network.	Remember	CLO6	CO2	ACS510.06
11	How open APIs work in SDN?	open APIs for interface between the SDN application and control layers.	Remember	CLO6	CO2	ACS510.06
12	Expand the term NFV	Network Function Virtualization	Remember	CLO6	CO2	ACS510.06
13	What is the use of VNF in NFV?	VNF is a software implementation of a network function which is capable of running over the NFV Infrastructure	Remember	CLO6	CO2	ACS510.07
14	What is YANG?	YANG is a data modeling language used to model configuration and state data manipulated by the NETCONF protocol.	Remember	CLO6	CO2	ACS510.07
15	What is the role of Management API in NETCONF?	allows management application to start NETCONF sessions.	Remember	CLO6	CO2	ACS510.07
16	What is the role of Configuration API in NETCONF?	Read configuration data from the configuration data store and write operational data to the operational data store.	Remember	CLO6	CO2	ACS510.07
17	What is the role of Data Provider API in NETCONF?	Applications on the IoT device can register for callbacks for various events.	Remember	CLO6	CO2	ACS510.08
18	What is the role of rollback manager in NETCONF?	Responsible for generating all the transactions necessary to rollback a current configuration to its original state.	Remember	CLO6	CO2	ACS510.07
19	What is the role of Data Model Manager in NETCONF?	Keeps track of all the YANG data models and the corresponding managed objects.	Remember	CLO7	CO2	ACS510.07

20	What is the role of Configuration validator in NETCONF?	Checks if the resulting configuration after applying a transaction would be a valid configuration.	Remember	CLO7	CO2	ACS510.07
21	What is the meaning of M2M?	Machine to Machine (M2M) indicates a wireless or wired network setup that allows devices of the same type and ability to communicate easily.	Remember	CLO7	CO2	ACS510.03
22	Write purpose of Gateway?	It is an interfacing device that receives data from many other points on the network and transmits data to another network.	Remember	CLO7	CO2	ACS510.06
23	Define control plane in IOT.	Control plane is the part of the network that carries the signaling and routing message traffic	Remember	CLO7	CO2	ACS510.06
24	List the drawbacks of conventional network architecture to IOT.	Drawbacks of conventional network are 1.Complex network devices 2.Management overload 3.Limited scalability	Remember	CLO7	CO2	ACS510.06
25	REST stands for	Representational State Transfer protocols.	Remember	CLO7	CO2	ACS510.06
26	What is Open Flow?	Open Flow is defined by the Open Networking Foundation (ONF) is the broadly accepted SDN protocol for the southbound interface.	Remember	CLO7	CO2	ACS510.06
27	SDN stands for	Software Defined Networking.	Remember	CLO7	CO2	
28	List out the differences of IoT and M2M?	The differences between IoT and M2M are: 1. M2M uses non-IP based communication protocol for communication within the M2M area networks; IoT uses IP-based protocols for communication. 2. IoT systems can have heterogeneous things, where as M2Msystems usually have the same machine types with init. 3. The emphasis of M2M is more on hardware; where as the emphasisof IoT is more on software.	Understand	CLO7	CO2	ACS510.03
29	Write the elements of NFV Infrastructure?	NFV Infrastructure includes compute, network and storage resources that are virtualized.	Remember	CLO7	CO2	ACS510.06
30	List out the key elements of SDN?	The key elements of SDN include centralized network controller, programmable open APIs and a standard communication interface.	Remember	CLO7	CO2	ACS510.06
31	Define YANG.	YANG is a data modeling language used to model configuration and state data. manipulated by the NETCONF protocol.	Remember	CLO7	CO2	ACS510.06

S No	QUESTION	ANSWER	Blooms Level	CLO	CO	CLO Code
32	Write the functions of transaction manager in IoT system?	ACID(Atomicity, Consistency, Isolation, Durability) Properties hold true for transactions.		CLO7	CO2	
33	Write the purpose of get- schema in NETCONF server	The operation get-schema retrieve a schema from the NETCONF server	Remember	CLO7	CO2	ACS510.06
34	State the communication protocols in M2M?	The M2M communication protocols are used in IOT system, there are ZigBee, Bluetooth, ModBus, Power Line Communication and 6LoWPAN	Remember	CLO7	CO2	ACS510.06
35	What is Application program interface (API)?	A collection of commands and protocols used to interact with an operating system, device, or specific software component.	Remember	CLO7	CO2	ACS510.06
36	List some differences of M2M and IoT	The differences of M2M and IoT are 1.Communication protocols 2.Machines Vs Things 3.Haredware Vs Software 4.Data collection and analysis 5.Applications	Understand	CLO7	CO2	ACS510.04
37	State the purpose of software defined networking	Software defined networking(SDN) is a networking architecture that separates the control plane from the data plane and centralizes the network controller.	Understand	CLO7	CO2	ACS510.05
38	Define control plane	Control plane is the part of the network that carries the signaling and routing message traffic	Remember	CLO7	CO2	ACS510.04
39	List the limitations of conventional network architecture	Limitations of conventional network architecture are 1.Complex network devices 2.Management overload 3.Limited scalability	Remember	CLO7	CO2	ACS510.05
40	What is Open Flow?	Open Flow is defined by the Open Networking Foundation (ONF) is the broadly accepted SDN protocol for the southbound interface. With Open Flow, the forwarding pane of the network devices can be directly accessed and manipulated	Understand	CLO 8	CO2	ACS510.06

41	What elements are virtualized in NFV Infrastructure?	NFV Infrastructure includes compute, network and storage resources that are virtualized. Virtualizing network functions reduces the equipment costs and also reduces power consumption	Understand	CLO 8	CO2	ACS510.06
42	State the function of centralized network controller	Centralized network controller makes the administrators configure the network.SDN applications can be deployed through programmable open APIs. This speeds up innovation as the network administrators need not wait for the device vendors to embed new features in their hardware	Remember	CLO 8	CO2	ACS510.04
43	Define data plane	Data plane is the part of the network that carries the payload data traffic	Understand	CLO 8	CO2	ACS510.04
44	What is the role of transaction manager in IoT system	Transaction manager executes all the NETCONF transactions and ensures that the ACID(Atomicity, Consistency, Isolation, Durability) properties hold true for transactions.	Understand	CLO 8	CO2	ACS510.05
45	What is the role of NETCONF server	Network Configuration Protocol (NETCONF) is a session-based network management protocol. It allows retrieving state or configuration data and manipulating configuration data on network devices.	Remember	CLO 8	CO2	ACS510.06
46	State the purpose of get- schema in NETCONF server	The operation get-schema retrieve a schema from the NETCONF server	Remember	CLO 8	CO2	ACS510.06
47	Define the purpose of container node for data modeling in YANG	Container node for data modeling in YANG is used to group related nodes in a subtree. A container has only child nodes and no value. A container may contain any number of child nodes of any type(including leafs, lists, containers and leaf-lists)	Understand	CLO 8	CO2	ACS510.05
48	Which protocol is used in SNMP?	Simple Network Management protocol(SNMP) is an application layer protocol that uses user datagram protocol(UDP) as the transport protocol	Remember	CLO 8	CO2	ACS510.04
49	List the sections of YANG module	The sections of YANG module are 1.Header information 2.Imports and includes 3.Type definitions 4.Configuration and operational data declarations 5.RPC and notification declarations	Understand	CLO 8	CO2	ACS510.06
50	What is the function of data model manager in IoT system	The data model manager keeps track of all the YANG data models and the corresponding managed objects. The data model manager also keeps track of the applications which provide data for each part of a model.	Remember	CLO 8	CO2	ACS510.05

51	Define M2M?	Machine to Machine (M2M) refers to a wireless or wired network setup that allows devices of the same type and ability to communicate freely.	Remember	CLO 8	CO2	ACS510.03
52	Write about Gateway?	It is an internetworking connecting device that receives information from many other points on the network and transmits information to another network.	Remember	CLO 8	CO2	ACS510.06
53	What is REST?	Representational State Transfer. An architecture for web standards, especially for the HTTP protocol. It is supposed to simplify the design of network applications compared to, for example, SOAP.	Remember	CLO 8	CO2	ACS510.06
54	What are RESTful Web Services?	Web services that are realized within the REST architecture are called RESTful Web Services.	Remember	CLO 8	CO2	ACS510.06
55	What is Software-Defined Network (SDN)?	Software Defined Networking is a networking architecture that separates the control plane from the data plane and centralizes the network controller.	Remember	CLO 8	CO2	ACS510.06
56	What are the key elements of SDN?	Key elements of SDN include centralized network controller, programmable open APIs and a standard communication interface.	Remember	CLO 8	CO2	ACS510.06
57	Write the differences between IoT and M2M?	The differences between IoT and M2M are: 1. M2M uses non-IP based communication protocol for communication within the M2M area networks, IoT uses IP-based protocols for communication. 2. IoT systems can have heterogeneous things, whereas M2M systems usually have the same machine types within it. 3. The emphasis of M2M is more on hardware, whereas the emphasis of IoT is more on software.	Understand	CLO 8	CO2	ACS510.03
58	What is SNMP?	Simple network management protocol that allows monitoring and configuring network devices such as routers, switches, servers, printers.	Remember	CLO 8	CO2	ACS510.06
59	Write about NETCONF?	Network configuration protocol is a session based network management protocol. It allows retrieving state or configuration data and manipulating configuration data on network devices.	Remember	CLO 8	CO2	ACS510.06
60	What is YANG?	YANG is a data modeling language used to model configuration and state data manipulated by the NETCONF protocol.	Remember	CLO 8	CO2	ACS510.06
61	Write the various communication protocols used in M2M?	Various M2M communication protocols are : ZigBee, Bluetooth, ModBus, Power Line Communication and 6LoWPAN	Remember	CLO 8	CO2	ACS510.06
62	State Lightweight Protocol?	Any protocol that has a lesser and leaner payload when being used and transmitted over a network connection.	Remember	CLO 8	CO2	ACS510.06
63	Define Application program interface	A collection of commands and protocols used to interact with an operating system, device, or specific software component.	Remember	CLO 8	CO2	ACS510.06

	(API)?					
64	List out some protocols used in IoT?	Message Queuing Telemetry Transport, Constrained Application Protocol, User Datagram Protocol, Data-Distribution Service, Transmission Control Protocol, User Datagram Protocol, etc.	Remember	CLO6	CO2	ACS510.06
65	Define Embedded systems?	It is a computer system that has computer hardware and software embedded to perform specific tasks.	Remember	CLO6	CO2	ACS510.05
UNIT – III						
1	Number of elements in the open IoT Architecture?	Seven	Remember	CLO11	CO3	ACS510.12
2	What are elements in open IoT Architecture?	Sensor Middleware, cloud data storage, scheduler, service delivery and utility manager, request definition, request presentation, configuration and monitoring.	Remember	CLO11	CO3	ACS510.11
3	What is the use of Global Sensor Network in IoT architecture?	Reduce cost and time for development	Remember	CLO11	CO3	ACS510.11
4	Which sensor/protocol is used in GSN?	CoAP	Remember	CLO11	CO3	ACS510.11
5	Open IoT manages the registration, data acquisition through which network?	X-GSN	Remember	CLO11	CO3	ACS510.11
6	Which environment does GSN work?	JAVA	Remember	CLO11	CO3	ACS510.09
7	Which community is working to establish IoT architecture?	Eclipse IoT	Remember	CLO11	CO3	ACS510.09
8	State of Architecture consists of how many layers?	Two	Remember	CLO11	CO3	ACS510.09

9	Name layers of State of Architecture of IoT.	ESB layer and Technical Layer	Remember	CLO11	CO3	ACS510.11
10	Expand the term SOA	Service Oriented architecture	Remember	CLO11	CO3	ACS510.11
12	What is the use of dictionary in python?	Stores values in terms of keys and values	Remember	CLO11	CO3	ACS510.10
13	What is the return value of trunc() in python?	Int	Remember	CLO11	CO3	ACS510.11
14	What is the arithmetic operator that cannot be used with strings in python?	-(minus)	Remember	CLO11	CO3	ACS510.11
15	To read two characters in from a file object infile what function is used in python?	infile.read(2)	Remember	CLO11	CO3	ACS510.12
16	To read entire contents from a file object infile what function is used in python?	infile.read()	Remember	CLO11	CO3	ACS510.12
17	Which function overloads the + operator in python?	_add_()	Remember	CLO11	CO3	ACS510.10
18	What are first stages of IOT architecture components?	There are four components are there in IOT architecture: 1. Sensors, 2. Actuators, 3. Sensing.	Remember	CLO11	CO3	ACS510.04
20	Write the stage two components of IOT architecture	The stage 2 systems often sit in close proximity to the sensors and actuators.	Remember	CLO11	CO3	ACS510.01
21	What stage three functions IOT architecture?	Analytics and pre-processing.	Remember	CLO11	CO3	ACS510.04
22	What stage four functions IOT architecture?	The architecture is performs various operations in stage four like analytics, management, and archive.	Remember	CLO11	CO3	ACS510.04

23	Explain about importance of Python in IOT system.	Python is a general-purpose high level programming and it is useful in cloud computing .	Remember	CLO11	CO3	ACS510.04
24	What is function of Number data type in IOT?	Number data type is used to store numeric values.	Remember	CLO11	CO3	ACS510.01
25	List the important characteristics of Python.	The main characteristics of Python are 1.Multi-paradigm programming language 2.Interpreted language 3.Interactivelanguage 4.Object and procedureoriented 5.Portable 6. Scalable 7. Board librarysupport	Remember	CLO11	CO3	ACS510.02
26	What is meaning of an empty string?	A string which has zero characters is called an empty string.	Remember	CLO11	CO3	ACS510.02
27	Write the benefits of ARM	IoT-A ARM provides many benefits 1.Cognitive aid 2. IoT-A reference model as acommon ground 3. Generation of architectures 4. Identifyingdifferences 5.Benchmarking	Remember	CLO11	CO3	ACS510.01
28	Define a function?	A function in Python is a block of code that begins with the keyword def followed by the function name and parenthesis. The function parameters are enclosed within parenthesis.	Remember	CLO11	CO3	ACS510.01
29	Write the purpose of package in IOT	Python package is hierarchical file structure that consists of modules and sub packages. Packages allow better organization of modules related to a single application environment.	Remember	CLO11	CO3	ACS510.10
30	Define Flask	Flask is a Python web framework to turn Raspberry Pi into a dynamic web server. It also supports many different extensions for doing things such as user authentication, generating forms, adjusting databases.	Remember	CLO11	CO3	ACS510.10
31	Write the importance of Pass statement?	A pass statement in python is a null operation. The pass statement is used when statement is required syntactically but you do not want any command or code to execute.	Remember	CLO11	CO3	ACS510.10
32	Write the purpose of break/continue statement?	The break statement breaks out of the for/while loop whereas the continue statement continues with the next iteration.	Remember	CLO11	CO3	ACS510.06

33	List the characteristics of Python	Python is a general purpose high level programming language. The main characteristics of Python are 1.Multi-paradigm programming language 2.Interpreted language 3.Interactivelanguage 4. Easy to learn, read andmaintain 5.Object and procedure oriented 6.Extendable 7.Portable 8.Scalable 9.Board library support	Remember	CLO 12	CO3	ACS510.8
34	Define List.	List is a compound data type used to group other values. List items need not all have same types. A list contains items separated by commas and enclosed within square brackets.	Remember	CLO 12	CO3	ACS510.9
35	Explain the reference architecture of IoT	A reference architecture (RA) can be visualized as the ‘matrix’ that give birth to all concrete architectures. For establishing such matrix we need superset of all functionalities, mechanisms and protocols.	Understand	CLO 12	CO3	ACS510.7
36	List the steps to send an email.	The steps to send an email 1. First a connection is established with the SMTP server bycalling smtpplib.SMTP with the server name andport. 2. The user name and password provided are then used to login into the server. 3.The email is then sent by calling server.sendmail function with thefrom address, to address list and message as input parameters.	Remember	CLO 12	CO3	ACS510.9
37	Define number data type.	Number data type is used to store numeric values. Numbers are immutable data types therefore changing the value of a number data type results in newly allocated object.	Remember	CLO 12	CO3	ACS510.9
38	What is Tuple?	Tuple is a sequence data type that is similar to the list. A tuple consists of values separated by commas and enclosed within parenthesis.	Understand	CLO 12	CO3	ACS510.9
39	Define Dictionary.	Dictionary is a mapping data type or a kind of hash table that maps keys to values. Keys in a dictionary can be of any data type, though numbers and strings are commonly used for keys.	Remember	CLO 12	CO3	ACS510.9

40	List the benefits of ARM	IoT-A ARM provides many benefits 1.Cognitive aid 2.IoT-A reference model as a common ground 3.Generation of architectures 4.Identifying differences 5.Benchmarking	Remember	CLO 12	CO3	ACS510.8
41	State the purpose of Pass statement?	A pass statement in python is a null operation. The pass statement is used when statement is required syntactically but you do not want any command or code to execute.	Understand	CLO 12	CO3	ACS510.9
42	What is a function?	Function is a block of code that takes information in does some computation and returns a new piece of information based on the parameter information. A function in Python is a block of code that begins with the keyword def followed by the function name and parenthesis. The function parameters are enclosed within parenthesis. The code block within a function begins after a colon that comes after the parenthesis enclosing the parameters.	Remember	CLO 12	CO3	ACS510.9
43	State module	A module is a python file that defines some functions in the form of functions or classes. Modules can be imported using the import key .Modules to be imported must be present in the search path.	Remember	CLO 12	CO3	ACS510.9
44	Define process and architecture methodology in ARM	Architecture methodology in ARM provides a meta-perspective of IoT-A process. It also explains the basic process how concrete systems can be developed by using ARM.	Understand	CLO 12	CO3	ACS510.7
45	Define Flask	Flask is a Python web framework to turn Raspberry Pi into a dynamic web server. It also supports many different extensions for doing things such as user authentication, generating forms, adjusting databases. We can also access a wide variety of standard Python libraries.	Understand	CLO 12	CO3	ACS510.9
46	State the purpose of package.	Python package is hierarchical file structure that consists of modules and Sub packages. Packages allow better organization of modules related to a single application environment.	Understand	CLO 12	CO3	ACS510.9
47	Write the purpose of file handling	Python allows reading and writing to files using the file object. The open(filename, mode)function is used to get a file object. The mode can be read(r), write(w),append(a) ,read and write(r+ or w+),read-binary(rb), write-binary(wb).After the file contents have been read the close function is called which closes the file object.	Remember	CLO13	CO3	ACS510.9

48	State the characteristics of Python Language?	The main characteristics of Python are: 1. Multi-paradigm programming language. 2. Interpreted & Interactive language. 3. Easy-to—learn, read and maintain 4. Object and Procedure oriented.	Remember	CLO13	CO3	ACS510.04
49	Explain about Python?	Python is a general-purpose high level programming language and suitable for providing a solid foundation in the area of cloud computing	Remember	CLO13	CO3	ACS510.04
50	Define Number data type ?	Number data type is used to store numeric values. Numbers are immutable data types, therefore changing the value of a number data type results in a newly allocated object.	Remember	CLO13	CO3	ACS510.01
51	Define a string?	A string is simply a list of characters in order. There are no limits to the number of characters you can have in a string.	Remember	CLO13	CO3	ACS510.02
52	Define an empty string?	A string which has zero characters is called an empty string.	Remember	CLO13	CO3	ACS510.02
53	Define a List?	List is a compound data type used to group together other values. List items need not all have the same type. A list contains items separated by commas and enclosed within square brackets.	Remember	CLO13	CO3	ACS510.01
54	Define a Tuple?	A tuple is a sequence data type that is similar to the list. A tuple consists of a number of values separated by commas and enclosed within parentheses.	Remember	CLO13	CO3	ACS510.01
55	Define a Dictionary?	Dictionary is a mapping data type or a kind of hash table that maps keys to values	Remember	CLO13	CO3	ACS510.10
56	Write the purpose of while- statement?	The while statement in Python executes the statements within the while loop as long as the while condition is true.	Remember	CLO13	CO3	ACS510.10
57	Write the purpose of range- statement?	The range statement in python generates a list of numbers in arithmetic progression	Remember	CLO13	CO3	ACS510.10
58	Write the purpose of for- statement?	The for statement in python iterates over items of any sequence (list, string) in the order in which they appear in the sequence.	Remember	CLO13	CO3	ACS510.06
59	Write the purpose of break/continue statement?	The break statement breaks out of the for/while loop whereas the continue statement continues with the next iteration.	Remember	CLO13	CO3	ACS510.06
50	Write the purpose of pass- statement?	The pass statement in Python is a null operation. It is used when a statement is required syntactically but you do not want any command or code to execute.	Remember	CLO13	CO3	ACS510.06

S No	QUESTION	ANSWER	Blooms Level	CLO	CO	CLO Code
51	Define a function?	A function is a block of code that takes information in the form of parameters, does some computation and returns a new piece of information based on the parameter information.	Remember	CLO14	CO3	ACS510.12
52	Define a Package?	Python package is hierarchical file structure that consists of modules and subpackages	Remember	CLO14	CO3	ACS510.12
UNIT – IV						
1	What are basic building blocks of IoT device?	Sensing, actuation, communication, analysis and processing	Remember	CLO14	CO	ACS510.13
2	What is Raspberry Pi?	Raspberry Pi is a low-cost mini-computer with the physical size of a credit card.	Remember	CLO14	CO4	ACS510.13
3	How does Raspberry Pi allows interfacing sensors and actuators?	through the general purpose I/O pins	Understand	CLO14	CO4	CO4
4	When Raspberry Pi supports Python "out of the box"?	When Raspberry Pi runs Linux operating system.	Remember	CLO14	CO4	CO4
5	What is Raspbian Linux on Raspberry Pi?	Raspbian Linux is a Debian Wheezy port optimized for Raspberry Pi	Understand	CLO14	CO4	CO4
6	What is RaspBMC on Raspberry Pi?	RaspBMC is an XBMC media-center distribution for Raspberry Pi.	Remember	CLO14	CO4	CO4
7	What are Raspberry Pi Interfaces?	Serial, SPI, I2C	Understand	CLO14	CO4	CO4
8	What are other devices in IoT other than Raspberry?	pcDuino, BeagleBone Black and Cubieboard	Remember	CLO14	CO4	CO4
9	How power sully is done to RPi?	By USB connection	Remember	CLO14	CO4	CO4
10	What is the Ethernet/LAN cable used in RPi?	RJ45	Understand	CLO14	CO4	CO4

11	Which instruction set architecture is used in Raspberry Pi?	ARM	Remember	CLO15	CO4	CO4
12	What is the default user in Debain in RPi?	Pi	Remember	CLO15	CO4	CO4
13	What bit processor is used in Pi 3?	64-bit	Remember	CLO15	CO4	CO4
14	What is the speed of operation in Pi 3?	1.2GHz	Remember	CLO15	CO4	CO4
15	How many ports are present in Raspberry Pi 3?	4	Remember	CLO15	CO4	CO4
16	What does we use to connect Tv to RPi?	Male HDMI and adapter	Remember	CLO15	CO4	CO4
17	What are the distributions are supported in Raspberry Pi?	Arch Linux, Debain and Fedora Remix	Remember	CLO15	CO4	CO4
18	Wi Fi is not present in which of the Raspberry Pi Model?	Raspberry Pi Zero	Remember	CLO15	CO4	CO4
19	What is required to boot the RPi?	SD-Card	Remember	CLO15	CO4	CO4
20	What is OpenELEC on Raspberry Pi?	OpenELEC is a fast and user-friendly XBMC media-center distribution	Remember	CLO15	CO4	CO4
21	What is Raspberry Pi	It is a low cost mini-computer with the physical size of a credit card.	Remember	CLO15	CO4	CO4
22	Write the Raspberry Pi interfaces?	There are three Raspberry Pi interfaces. They are: 1.Serial interface 2.Serial peripheral interface 3. Inter-Integrated-Circuit bus (I2C).	Remember	CLO15	CO4	CO4

23	What is the importance of communication modules?	Communication modules are responsible for sending collected data to other devices or cloud-based servers/storage and receiving data from other devices and commands from remote applications.	Understand	CLO15	CO4	CO4
24	List out any three storage interfaces in IoT?	The storage interfaces in IoT are: 1.Secure Digital 2.Multi Media Card 3. Secure Digital Input Output.	Remember	CLO15	CO4	CO4
25	What is ZigBee Standard number in IEEE	The Zigbee IEEE 802.15.4(2003) standards while utilization.	Understand	CLO15	CO4	CO4
26	Write the purpose of Analysis & Processing modules?	Analysis and processing modules are responsible for making sense of the collected data.	Remember	CLO15	CO4	CO4
27	State the smart irrigation system in IoT?	The Smart Irrigation System is an IoT based device which is capable of automating the irrigation process by analyzing the moisture of soil and the climate condition.	Understand	CLO15	CO4	CO4
28	SPI stands for	Serial Peripheral Interface is a synchronous serial data protocol.	Understand	CLO15	CO4	CO4
29	What is Pygame.	It is a tool for general multimedia programming. It is convenient way to just draw graphics on the screen.	Remember	CLO15	CO4	CO4
30	What is Accelerometer?	A tool that measures changes in gravitational acceleration in the unit it may be installed in. Accelerometers are used to measure acceleration, tilt, and vibration in many devices.	Remember	CLO15	CO4	CO4
31	Write the importance of serial interface.	The serial interface on Raspberry Pi has receive (Rx) and transmit (Tx) pins for communication with serial peripherals.	Remember	CLO15	CO4	CO4
32	State the function of I2C?	I2C interface allows synchronous data transfer with just two pins - SDA (data line) and SCL (clock line).		CLO15	CO4	CO4
33	Define Home Automation?	The automation is a certain activities within a household. This can include automated control of lights, doors, and air conditioning.	Understand	CLO15	CO4	CO4
34	URI stands for	Uniform Resource Identifier	Remember	CLO15	CO4	CO4
35	List out the building blocks of an IoT device.	The basic building blocks of an IoT are: sensors, actuators, communication protocols and analysis components.	Remember	CLO15	CO4	CO4
36	What is a sensor?	Sensors can be either on-board the IoT device or attached to the device.	Remember	CLO 12	CO4	CO4

37	Explain the purpose of Sprites	Sprites-It handles most of the movable and controllable graphical elements of a game Sprites are best used when you will be creating several screen elements that share a lot of the same code.	Understand	CLO 11	CO4	CO4
38	What is an actuator?	IoT devices can have various types of actuators attached that allow taking actions upon the physical entities in the vicinity of the device.	Remember	CLO 12	CO4	CO4
39	State the purpose of communication modules?	Communication modules are responsible for sending collected data to other devices or cloud-based servers/storage and receiving data from other devices and commands from remote applications.	Understand	CLO 12	CO4	CO4
40	State the purpose of Analysis & Processing modules?	Analysis and processing modules are responsible for making sense of the collected data.	Understand	CLO 10	CO4	CO4
41	Define Raspberry Pi hub.	Raspberry Pi hub is hosted by elinux.org. This is a massive Wiki of information on the Pi's hardware and configuration	Remember	CLO 11	CO4	CO4
42	What is Python package index?	Python package index (PyPI) is definitive list of packages(or modules)	Remember	CLO 10	CO4	CO4
43	Define Pygame.	Pygame is a lightweight framework for creating simple games in Python. It is a tool for general multimedia programming. It is convenient way to just draw graphics on the screen, plays sounds or handle key-board on mouse events.	Remember	CLO 10	CO4	CO4
44	State the purpose of Pygame surfaces	A pygame surface is just a rectangular image. Surfaces are combined and layered to create each scene in a frame of the game or animation. The pixels of a surface are represented by a sequence of three 8 bit RGB numbers(e.g:0,255,0) represents green. A fourth number is used for transparency(0,255,0,127) is 50 percent transparent	Understand	CLO 11	CO4	CO4
45	What is Linux's virtual file system?	The files that we work are not actual files on the Raspberry Pi's SD card but rather are a part of Linux's virtual file system, which is a system that makes it easier to access low level functions of the board in a simpler way.	Remember	CLO 12	CO4	CO4
46	Define Flask	Flask is a Python web framework to turn Raspberry Pi into a dynamic web server. It also supports many different extensions for doing things such as user authentication, generating forms, adjusting databases. We can also access a wide variety of standard Python libraries.	Remember	CLO 10	CO4	CO4

47	Explain the purpose of serial interface.	The serial interface on Raspberry Pi has receive (Rx) and transmit (Tx) pins for communication with serial peripherals.	Understand	CLO 10	CO4	CO4
48	Explain the purpose of serial Peripheral interface	Serial Peripheral Interface (SPI) is a synchronous serial data protocol used for communicating with one or more peripheral devices.	Understand	CLO 12	CO4	CO4
49	State the purpose of I2C?	The I2C interface pins on Raspberry Pi allow you to connect hardware modules. I2C interface allows synchronous data transfer with just two pins - SDA (data line) and SCL (clock line).	Understand	CLO 10	CO4	CO4
50	What is a sensor?	Sensors can be either on-board the IoT device or attached to the device.	Remember	CLO 12	CO4	CO4
51	Write about Raspberry Pi?	It is a low cost mini-computer with the physical size of a credit card.	Remember	CLO15	CO4	CO4
52	List out the Raspberry Pi interfaces?	There are three Raspberry Pi interfaces.They are :1.Serial interface 2.Serial peripheral interface 3. Inter-Integrated-Circuit bus (I2C).	Remember	CLO15	CO4	CO4
53	List out some of the storage interfaces in IoT?	The storage interfaces in IoT are:1.Secure Digital 2.Multi Media Card 3. Secure Digital Input Output.	Remember	CLO15	CO4	CO4
54	Why is Zigbee protocol so important for the Internet of Things implementation?	The Zigbee protocol is very important because it is known for its low power consumption, it maintained IEEE 802.15.4(2003) standards while utilization.	Understand	CLO15	CO4	CO4
55	What does WSN stand for in Internet of Things concept?	The acronym WSN stands for Wireless Sensor Network. It is considered to be the foundation of the Internet of Things applications.	Remember	CLO15	CO4	CO4
56	Write about Serial Raspberry Pi interface?	The serial interface on Raspberry Pi has receive and Transmit pins for communication with serial peripherals.	Remember	CLO15	CO4	CO4
57	Write about SPI Raspberry Pi interface?	Serial peripheral interface is a synchronous serial data protocol used for communication with one or more peripheral devices.	Understand	CLO15	CO4	CO4
58	Write about I2C Raspberry Pi interface?	The I2C interface pins on Raspberry Pi allow you to connect hardware modules.	Remember	CLO15	CO4	CO4
59	What is Accelerometer?	A tool that measures changes in gravitational acceleration in the unit it may be installed in. Accelerometers are used to measure acceleration, tilt, and vibration in many devices.	Remember	CLO15	CO4	CO4

60	What is Arduino?	A single-board microcontroller used for prototyping without having to deal with breadboards or soldering. The software to operate an Arduino is free and open source.	Remember	CLO15	CO4	CO4
61	What is Home Automation?	The automation of certain activities within a household. This can include automated control of lights, doors, and air conditioning.	Understand	CLO15	CO4	CO4
62	What is Uniform Resource Identifier (URI)?	The unique identifier that makes content addressable on the Internet by uniquely targeting items, such as text, video, images, and applications.	Remember	CLO15	CO4	CO4
63	What are the basic building blocks of an IoT device?	The following are the basic building blocks of an IoT are: sensors, actuators, communication protocols and analysis components.	Remember	CLO15	CO4	CO4
64	Define a Module?	A module is a Python file that defines some functionality in the form of functions or classes.	Remember	CLO15	CO4	CO4
65	What is smart irrigation system in IoT?	The Smart Irrigation System is an IoT based device which is capable of automating the irrigation process by analyzing the moisture of soil and the climate condition.	Understand	CLO15	CO4	CO4
UNIT – V						
1	Expand the term WAMP.	Web Application Messaging Protocol	Remember	CLO15	CO4	ACS510.17
2	Define WAMP.	Web Application Messaging Protocol (WAMP) is a sub-protocol of WebSocket which provides publish-subscribe and remote procedure call (RPC) messaging patterns	Remember	CLO15	CO4	ACS510.17
3	What is the use of Transport in WAMP for IoT?	Transport is channel that connects two peers	Remember	CLO15	CO4	ACS510.17
4	What is the use of Session in WAMP for IoT?	Session is a conversation between two peers that runs over a transport	Remember	CLO15	CO4	ACS510.17
5	Expand the term RPC	Remote Procedure Call	Remember	CLO15	CO4	ACS510.17
6	What is Boto?	Boto is a Python package that provides interfaces to Amazon Web Services (AWS).	Remember	CLO15	CO4	ACS510.17

7	What is significance of AutoScaling Service in Amazon AutoScaling?	A connection to AutoScaling service is first established by calling boto.ec2.autoscale.connect_to_region function	Remember	CLO15	CO4	ACS510.18
8	What is use Launch Configuration in Amazon AutoScaling?	Launch configuration contains instructions on how to launch new instances including the AMI-ID, instance type, security groups.	Remember	CLO15	CO4	ACS510.18
9	How Auto Scaling Group is created in Amazon AutoScaling?	by calling conn.create_auto_scaling_group	Remember	CLO15	CO4	ACS510.17
10	How a connection to S3 service is first established in Amazon S3?	by calling boto.connect_s3 function.	Remember	CLO15	CO4	ACS510.17
11	How a connection to RDS service is first established in Amazon RDS?	by calling boto.rds.connect_to_region function.	Remember	CLO15	CO4	ACS510.17
12	How a connection to DynamoDB service is first established in Amazon Dynamo DB?	By calling boto.dynamodb.connect_to_region	Remember	CLO15	CO4	ACS510.17
13	How MapReduce will be done in Python?	With Inverted Index Reducer Program	Remember	CLO15	CO4	ACS510.18
14	Expand the term JSON	Javascript Object Notation	Remember	CLO15	CO4	ACS510.18
15	How JSON is built?	JSON is built on two structures - a collection of name-value pairs (e.g. a Python dictionary) and ordered lists of values (e.g.. a Python list).	Remember	CLO15	CO4	ACS510.18
16	What is an XML?	XML (Extensible Markup Language) is a data format for structured document interchange.	Remember	CLO15	CO4	ACS510.18
17	How a minimal implementation of the Document Object Model	The Python minidom library provides a minimal implementation of the Document Object Model interface.	Remember	CLO15	CO4	ACS510.19

	interface is provided?					
18	What are HTTPLib2 and URLLib2?	HTTPLib2 and URLLib2 are Python libraries used in network/internet programming	Remember	CLO14	CO4	ACS510.19
19	What is the significance of Python Smtplib module ?	The Python smtplib module provides an SMTP client session object that can be used to send email.	Remember	CLO14	CO4	ACS510.19
20	Django is which type of framework?	Django is Model-Template-View (MTV) framework.	Remember	CLO14	CO4	ACS510.19
21	Write the web Application messaging protocol.	Web Application Messaging Protocol (WAMP) is a sub-protocol of Web socket which provides publish-subscribe and remote procedure call (RPC) messaging patterns.	Remember	CLO14	CO4	ACS510.13
22	What is the concept of Smart home?	A smart home is a residence that uses internet-connected devices to enable the remote monitoring and management of appliances and systems, such as lighting and heating.	Remember	CLO14	CO4	ACS510.13
23	Write the importance of Smart Cities.	Smart city technology is increasingly being used to improve public safety, from monitoring areas of high crime to improving emergency preparedness with sensors.	Remember	CLO14	CO4	ACS510.13
24	SMTP stands for	Simple Mail Transfer Protocol (SMTP).	Remember	CLO14	CO4	ACS510.13
25	XML stands for	XML (Extensible Markup Language) is a data format for structured document interchange.	Remember	CLO14	CO4	ACS510.13
26	Define JSON.	JavaScript Object Notation is an easy to read and write data-interchange format.	Remember	CLO14	CO4	ACS510.13
27	Write the cloud storage models.	The popular models of cloud storage are : 1. Amazon web service Xively cloud	Remeber	CLO14	CO4	ACS510.13
28	List out the models are used in WAMP.	Web Application Messaging Protocol (WAMP) is a sub-protocol of Web Socket which provides publish-subscribe and remote procedure call messaging patterns.	Remember	CLO14	CO4	ACS510.06
29	What is function of Boto?	Boto is a python package that provides interfaces to Amazon web services.	Remember	CLO14	CO4	ACS510.07
30	What are functional blocks of IoT system?	The functional blocks of IoT are Device, communication, services, management, security, application.	Understand	CLO14	CO4	ACS510.05

31	What is Autobahn for IoT?	It is a open source framework for web, mobile and internet of things.	Remember	CLO14	CO4	ACS510.07
32	What is function of Amazon RDS?	It provides cost-efficient and resizable capacity while automating time-consuming administration tasks such as hardware provisioning, database setup, patching and backups.	Understand	CLO14	CO4	ACS510.05
33	Write the purpose of Amazon EC2.	Amazon EC2 (Elastic Compute Cloud) is a web service interface; it is designed for developers to have complete control over web-scaling and computing resources.	Remember	CLO14	CO4	ACS510.10
34	RPC stands for	Remote Procedure Call (RPC).	Understand	CLO14	CO4	ACS510.09
35	Write the function of RPC?	It is a protocol that one program can use to request a service from a program located in another computer on a network without having to understand the network's details. A procedure call is also sometimes known as a function call or a subroutine call.	Remember	CLO14	CO4	ACS510.13
36	State the purpose of Smart Cities.	Smart city technology is increasingly being used to improve public safety, from monitoring areas of high crime to improving emergency preparedness with sensors. For example, smart sensors can be critical components of an early warning system before droughts, floods, landslides or hurricanes.	Remember	CLO14	CO4	ACS510.15
37	Define the concept of Smart home?	A smart home is a residence that uses internet-connected devices to enable the remote monitoring and management of appliances and systems, such as lighting and heating. Smart home technology, also often referred to as home automation or domotics (from the Latin "domus" meaning home), provides homeowners security, comfort, convenience and energy efficiency by allowing them to control smart devices, often by a smart home app on their smart phone or other networked device. A part of the internet of things (IoT), smart home systems and devices often operate together, sharing consumer usage data among themselves and automating actions based on the homeowners' preferences.	Remember	CLO14	CO4	ACS510.15
38	State the purpose of NumPy package?	NumPy is a package for scientific computing in Python. NumPy provides support for large multi-dimensional arrays and matrices.	Remember	CLO14	CO4	ACS510.14
39	What is Scikit-learn package?	Scikit-learn is an open source machine learning library for python that provides implementations of various machine learning algorithms for classification, regression and dimension reduction problems.	Remember	CLO14	CO4	ACS510.13
40	Define Map Reduce?	The Map function reads the data from the standard input (stdin) and splits the tab-limited data into document-ID and contents of the document-ID. The Map function emits key-value pairs where key is each word in the document and value is the document-ID.	Remember	CLO14	CO4	ACS510.13

41	Define JSON?	JavaScript Object Notation is an easy to read and write data-interchange format. JSON is used as an alternative to XML and is easy for machines to parse and generate.	Remember	CLO14	CO4	ACS510.13
42	What is Extensible Markup Language?	Extensible Markup Language is a data format for structured document interchange. The Python minidom library provides a minimal implementation of the Document Object Model Interface and has an API similar to that in other languages.	Remember	CLO14	CO4	ACS510.13
43	State the purpose of HTTP Library function?	HTTPLib is module defines classes which implement the client side of the HTTP and HTTPS protocols. It is normally not used directly — the module urllibuses it to handle URLs that use HTTP and HTTPS.	Remember	CLO14	CO4	ACS510.13
44	Define SMTPLib function?	Simple Mail Transfer Protocol (SMTP) is a protocol which handles sending email and routing e-mail between mail servers. The Python smtplib module provides an SMTP client session object that can be used to send email.	Remember	CLO14	CO4	ACS510.13
45	State the role of Django?	Dijango is an open source web application framework for developing web applications in python. A web application framework is a collection of solutions, packages and best practices that allows development of web applications and dynamic websites.	Remember	CLO14	CO4	ACS510.14
46	What models are used in WAMP?	Web Application Messaging Protocol (WAMP) is a sub-protocol of Web Socket which provides publish-subscribe and remote procedure call messaging patterns.	Remember	CLO14	CO4	ACS510.13
47	What is Amazon RDS?	Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while automating time-consuming administration tasks such as hardware provisioning, database setup, patching and backups. It frees you to focus on your applications so you can give them the fast performance, high availability, security and compatibility they need.	Remember	CLO14	CO4	ACS510.15
48	State the purpose of Amazon EC2.	Amazon EC2 (Elastic Compute Cloud) is a web service interface that provides resizable compute capacity in the AWS cloud. It is designed for developers to have complete control over web-scaling and computing resources.	Remember	CLO14	CO4	ACS510.15

49	Define AWS Auto Scaling?	AWS Auto Scaling monitors your applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost. Using AWS Auto Scaling, it's easy to setup application scaling for multiple resources across multiple services in minutes. The service provides a simple, powerful user interface that lets you build scaling plans for resources including Amazon EC2 instances and Spot Fleets, Amazon EC2 tasks, Amazon DynamoDB tables and indexes, and Amazon Aurora Replicas.	Remember	CLO14	CO4	ACS510.14
50	List the purpose of RPC?	Remote Procedure Call (RPC) is a protocol that one program can use to request a service from a program located in another computer on a network without having to understand the network's details. A procedure call is also sometimes known as a function call or a subroutine call.	Remember	CLO14	CO4	ACS510.14
51	What is web application messaging protocol?	Web Application Messaging Protocol (WAMP) is a sub-protocol of WebSocket which provides publish-subscribe and remote procedure call (RPC) messaging patterns.	Remember	CLO14	CO4	ACS510.13
52	What is NumPy?	NumPy is a package for scientific computing in Python. NumPy provides support for large multi-dimensional arrays and matrices.	Remember	CLO14	CO4	ACS510.13
53	What is SMTPLib?	Simple Mail Transfer Protocol (SMTP) is a protocol which handles sending email and routing e-mail between mail servers. The Python smtplib module provides an SMTP client session object that can be used to send email.	Remember	CLO14	CO4	ACS510.13
54	What is XML?	XML (Extensible Markup Language) is a data format for structured document interchange. The Python minidom library provides a minimal implementation of the Document Object Model interface and has an API similar to that in other languages.	Remember	CLO14	CO4	ACS510.13
55	Define Virtual workspaces?	An abstraction of an execution environment that can be made dynamically available to authorized clients by using well-defined protocols.	Remember	CLO14	CO4	ACS510.13
56	List out the cloud storage models?	The popular models of cloud storage are : 1. Amazon web service Xively cloud	Remember	CLO14	CO4	ACS510.13
57	What is xively cloud service?	It is a commercial platform as a service for the internet of things	Remember	CLO14	CO4	ACS510.06
58	What is Boto?	Boto is a python package that provides interfaces to Amazon web services.	Remember	CLO14	CO4	ACS510.07
59	List the functional blocks of IoT?	The functional blocks of IoT are Device, communication, services, management, security, application.	Understand	CLO14	CO4	ACS510.05
60	What is Autobahn for IoT?	It is an open source framework for web, mobile and internet of things.	Remember	CLO14	CO4	ACS510.07

61	Write the features of Autobahn?	The features of Autobahn are: Websocket protocol and WAMP clients.	Understand	CLO14	CO4	ACS510.05
62	Define JSON?	JavaScript Object Notation. It is used as a lightweight alternative to XML for organizing data, JSON is text-based and human-readable.	Remember	CLO14	CO4	ACS510.10
63	Write the purpose of Mapreduce function?	The Mapreduce function reads the data from the standard input and splits the tab-limited data into document-ID and contents of the document.	Understand	CLO14	CO4	ACS510.09
64	Write about Scikit-learn package?	Scikit-learn is an open source machine learning library for Python that provides implementations of various machine learning algorithms for classification, clustering, regression and dimension reduction problems.	Remember	CLO14	CO4	ACS510.13
65	Write the purpose of HTTPLib&UR LLib ?	HTTPLib2 and URLLib2 are Python libraries used in network/internet programming.	Remember	CLO14	CO4	ACS510.13

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