INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

QUESTION BANK

Course Title	**INTERNET OF THINGS**				
Course Code	AITB20				
Program	B.Tech				
Semester	V	IT			
Course Type	Elective				
Regulation	IARE - R18				
Course Structure	Theory			Practical	
	Lecture	Tutorials	Credits	Laboratory	Credits
	3	-	3	-	-
Course Coordinator	Ms. Vijaya Durga C.S.L, Assistant Professor				

COURSE OBJECTIVES:

The students will try to learn:

I	The significance of the Internet of Things
II	The sensors, actuators and communication protocols used for establishing communication in M2M.
III	The real time IoT applications related to smart environments.

COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	**Recall** design and characteristics of IoT for reuse of deployed IoT resources across application domains.	Remember
CO 2	**Illustrate** levels of IoT for storage of data either in local server or cloud.	Understand
CO 3	**Relate** most common ways of communication models for accessing data from sensors and actuators.	Understand
CO 4	**Identify** the differences between Machine to Machine and IoT for data exchange between devices.	Apply
CO 5	**Recall** network control functions (SDN &NFV) for communication with hardware infrastructure and direct traffic on a network.	Remember

CO 6	**Demonstrate** device management with NETCONFG-YANG for configuration data and manipulating configuration data on network.	Understand
CO 7	**Relate** architectural reference model for managing access control of IoT devices and the data they publish.	Understand
CO 8	**Identify** the necessity of communication protocols for overcoming issues like failure of any connected devices.	Apply
CO 9	**Demonstrate** importance of raspberry Pi interfaces (SPI, I2C) for connecting other devices/sensors to communicate with pi.	Understand
CO 10	**How** to set up the Raspberry Pi environment, get a Linux operating system running, for executing some basic Python code on the Raspberry Pi.	Remember
CO 11	**Choose** cloud storage models that are scalable & available on Demand	Apply
CO 12	**Identify** application program interface (REST, Communication)for better interchange of data between devices.	Apply

QUESTION BANK:

Q.No	QUESTION	Taxonomy	How does this subsume the level	CO's
MODULE I				
INTRODUCTIONTO INTERNET OF THINGS (IoT)				
PART A-PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS				
1	Describe with an example of IoT service that uses publish-subscribe and web socket based communication.	Understand	Recall the concept of IOT and Explain any IoT service with appropriate communiction model used.	CO3
2	Determine the IoT levels for designing home automation IoT system including smart lighting and intrusion detection.	Understand	Recall the levels of IoT and determine appropriate level for home automation services.	CO2
3	Determine the various communication models that can be used for weather monitoring system and identify which is a more appropriate model for this system. Describe the pros and cons of the system.	Understand	Recall the concept of IOT communication models and determine the communication model for weather monitoring system.	CO3

4	In Forest fire detection which level of IoT is used? Explain with a neat diagram and its working principle.	Understand	Recall the levels of IoT and identify the appropriate level for forest fire detection.	CO2
5	Determine the IoT levels for designing structural health monitoring. Explain with a neat diagram.	Understand	Recall the levels of IoT and identify the appropriate level for structural health monitoring.	CO2
6	Explain the role of coordinator in wireless sensor network	Understand	Recall the characteristics of IOT and explain the role of coordinator in wireless sensor network	CO1
7	Explain the architectural constraints of REST?	Understand	Recall the concept of IOT communication API's and explain architectural constraints of REST API	CO3
8	Explain the role of controller service in IoT systems?	Understand	Recall the characteristics of IOT and explain the role of controller service in IoT systems	CO1
9	Describe an example of IoT service with an example of web-based communication model	Understand	Recall the concept of IOT and explain any IoT service with web-based communication model used.	CO3
10	Identify the function of communication functional block in IoT systems?	Apply	Recall the functional block in IoT system	CO1
PART-B LONG ANSWER QUESTIONS				
1	Discuss the characteristics of IoT and explain them briefly.	Understand	Recall IOT characteristics	CO1
2	What are applications of IoT? Explain in detail about any 2 applications.	Understand	Recall IOT characteristics	CO1
3	Demonstrate the physical design of IoT with Things of IoT and protocols of IoT.	Understand	Recall IOT characteristics	CO1
4	Write the logical design of IoT with communication models.	Understand	Recall logical design of IOT	CO1
5	Explain the IoT communication APIs and its importance.	Understand	Recall communication APIs and its importance in IoT	CO1

6	Discuss about any three IoT enabling technologies.	Understand	Recall communication APIs and its importance in IoT	CO1
7	Illustrate the IoT level 1 with neat diagram.	Understand	Recall the concept of IOT levels and explain IoT level 1	CO2
8	Differentiate the IoT level 2 and level 4 in detail.	Understand	Recall the concept of IOT levels and compare IoT level 2 and level 4.	CO2
9	Explain the IoT level 3 and level 5 with diagrams.	Understand	Recall the concept of IOT levels and explain IoT level 3 and level 5.	CO2
10	Define the various domain specific applications of IoT.Explain any 2 in detail.	Understand	Explain various domain specific applications of IoT	CO1
11	Explain domain specific home automation of IoT	Understand	Explain home automation applications of IoT	CO1
12	Explain physical design of IoT in detail.	Understand	Recall the concept physical design of IoT	CO1
13	Explain Logical design of IoT in detail.	Understand	Recall the Logical design of IoT	CO1
14	Relate the logical design of IoT with communication models?	Understand	Recall the Logical design of IoT and relate it with communication models.	CO1
15	Explain the IoT communication APIs with neat diagrams.	Understand	Recall the concept of communication APIs and explain them in detail.	CO1
16	Discuss about trending IoT technologies.	Understand	Recall the concept of IOT and explain trending IoT technologies	CO1
17	Illustrate the IoT level 1 with diagram.	Understand	Recall the concept of IOT and explain level 1 with diagram	CO2
18	Differentiate the IoT level 2, level 3 and level 4 in detail.	Understand	Recall the concept of IOT levels and compare IoT level 2, level 3 and level 4 in detail.	CO2
19	Differentiate logical design and physical design of IoT.	Understand	Recall the cocepts of logical design of IoT and physical design of IoT.	CO1
20	Why do IoT systems have to be self-adapting and self-configuring.	Understand	Recall the characteristics of IOT and explain in detail about few characteristics.	CO1

PART-C SHORT ANSWER QUESTIONS				
1	What is IoT? Write short notes on IoT.	Remember	—	CO1
2	List any four characteristics of IoT.	Remember	—	CO1
3	State the importance of IoT.	Remember	—	CO1
4	What is Thing in IoT,explain in detail?	Understand	Recall the thing of IOT and explain process done in IOT	CO1
5	State about the importance of Thing in IoT.	Remember	—	CO1
6	Explain any three functions of IoT?	Understand	Recall the function of IOT and explain about three functions of IOT	CO1
7	What are design factors IoT?	Understand	Recall the function of IOT and design factors of IOT	CO1
8	What are the interfaces of WSN?	Remember	—	CO1
9	Define link layer protocols in IoT.	Remember	—	CO1
10	State any four domain specific IoT applications.	Remember	—	CO1
11	State about the importance of Thing in IoT.	Understand	Recall the function of IOT and explain about importance of Thing in IoT	CO1
12	Write the levels of IoT in the context of number of nodes used in each level.	Understand	Recall the levels of IOT.	CO2
13	Differentiate between information and knowledge inferred from data in IoT system?	Understand	Recall the functionality of IoT systems.	CO1
14	What are applications of IoT?	Remember	—	CO1
15	Explain the IoT communication models.	Remember	—	CO3
16	Compare various IoT levels.	Remember	—	CO2
17	List IoT layers and Protocols used.	Remember	—	CO1
18	Role of Wireless Networks in IoT.	Remember	—	CO1
19	List various communication models and communication API's in IoT.	Remember	—	CO3

20	What are different I/O interfaces for sensors in IoT?	Remember	—	CO3
MODULE II				
IoT AND M2M				
PART-A PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS				
1	What is the function of centralized network Controller in SDN? Differentiate between SDN and NVF	Analyze	Recall the concept of M2M and explain function of centralized network Controller in SDN and differentiate between SDN and NVF?	CO4,CO5
2	What are the differences between Machines in M2M and things in IoT and communication protocols in M2M and IoT?	Understand	Recall the concept of M2M and IoT and explain communication protocols in M2M and IoT	CO1,CO4
3	Why is network wide configuration protocol important for IoT systems? Explain with an Illustration.	Analyze	Recall the concept of M2M and explain network wide configuration important for IoT systems	CO4,CO6
4	What is NETCONF server explain its significance in IoT system Management with NETCONF- YANG?	Understand	Recall the concept of M2M and explain NETCONF server	CO4,CO6
5	Describe the roles of YANG and Trans API modules in device management, with a neat sketch.	Apply	Recall the concept of YANG and Trans API modules and identify their roles in device management.	CO6
6	What are the limitations of conventional network architecture and what is the need of SDN.	Understand	Recall the concept of conventional network architecture and find the limitations of it	CO5
7	Describe briefly about the basics of IoT System management with NETCONF-YANG.	Understand	Recall the purpose of IOT system management using NETCONF	CO6
8	Analyze which limitations make SNMP(Simple Network Management Protocol) unsuitable for IoT system	Analyze	Recall the concept of SNMP and NETCONF protocols.	CO6
9	Explain how M2M gateway is used in M2M communication.	Understand	Recall the concept of M2M gateway in M2M communication	CO4

10	How does control plane and data Plane communicate in SDN? .	Understand	Recall the concept of SDN and find how control plane and data Plane communicate	CO5
PART-B LONG ANSWER QUESTIONS				
1	Differentiate between IoT and M2M.	Understand	Recall the concept of IoT and M2M.	CO1,CO4
2	Explain the limitations of conventional network architectures.	Understand	Recall the concept of M2M and explain limitations of conventional network architectures.	CO5
3	Discuss about the key elements of SDN	Understand	Recall the concept of M2M and explain key elements of SDN	CO5
4	Describe how SDN can be used for various levels of IoT.	Understand	Recall the concept of IoT levels and SDN.	CO2,CO5
5	What is the function of a centralized network controller in SDN.	Understand	Recall the concept of M2M and explain centralized network controller in SDN.	CO5
6	Define network function virtualization and explain with neat diagram.	Understand	Recall the concept of network function virtualization.	CO5
7	Describe how network function virtualization can be used for virtualizing IoT devices.	Understand	Recall the concept of M2M and explain network function virtualization	CO3,CO5
8	Describe the IoT system management in detail.	Remember	—	CO6
9	What is the role of IoT NETCONF-YANG management?	Remember	—	CO2
10	Discuss about the IoT NETCONF-YANG with components.	Understand	Recall the concept of NETCONF protocol.	CO6
11	Differentiate between IoT and M2M.	Remember	—	CO2,CO4
12	Explain the limitations of conventional network architectures.	Understand	Recall the concept of M2M and explain limitations of conventional network architectures.	CO5
13	Discuss SDN architecture in detail	Understand	Recall the concept of M2M and explain SDN architecture in detail	CO5

14	How do data collection and analysis approaches differ in M2M and IoT?	Remember	—	CO1,CO4
15	Describe how SDN is used for different IoT levels	Understand	Recall the concept of IoT levels and SDN.	CO2,CO4
16	Describe how NFV is used for virtualization of IoT	Understand	Recall the concept of NFV.	CO5
17	Difference between SDN and NFV	Understand	Recall the concept of M2M and explain difference between SDN and NFV	CO5
18	What is the function of centralized network controller in SDN.	Understand	Recall the concept of M2M and explain function of centralized network controller in SDN	CO5
19	Which communication protocols are used in M2M local area network?	Remember	—	CO4
20	Describe YANG hierarchical structure with data types.	Remember	—	CO6
PART-C SHORT ANSWER QUESTIONS				
1	Write a short note on M2M?	Understand	Recall the concept of M2M.	CO4
2	Give the purpose of communication protocols used in M2M?	Remember	—	CO4
3	State Software Defined Networking?	Remember	—	CO5
4	Discuss the purpose of Conventional Networks?	Remember	—	CO5
5	List the advantages of SDN?	Understand	Recall the concept of M2M and explain advantages of SDN	CO4,CO5
6	What is Network Function Virtualization?	Understand	Recall the concept of M2M and explain Network Function Virtualization	CO5
7	State the differences and similarities between IoT and M2M?	Remember	—	CO2,CO4
8	How do data collection and analysis approaches differ in M2M and IoT?	Remember	—	CO4
9	Differentiate between configuration and state data?	Understand	Recall the concept of M2M and differentiate between configuration and state data	CO4

10	What is the function of a data model manager in M2M?	Understand	Recall the concept of M2M and explain function of a data model manager.	CO4
11	Explain is M2M gate way?	Understand	Recall the concept of M2M and explain M2M gate way	CO4
12	Differentiate communication protocols in IoT and M2M.	Understand	Recall the concept of M2M and explain communication protocols in IoT and M2M.	CO1,CO4
13	State are communication protocols in M2M	Understand	Recall the concept of M2M and explain communication protocols in M2M.	CO4
14	Write a short note on SDN?	Understand	Recall the concept of M2M and explain short note on SDN	CO4,CO5
15	Write a short note on M2M?	Understand	Recall the concept of M2M and explain short note on M2M	CO4
16	What is the need of IoT system management.	Remember	—	CO6
17	Explain the architecture of SDN.	Understand	-Recall the concept of SDN	CO5
18	List the advantages and disadvantages of M2M.	Remember	—	CO4
19	What is SNMP.	Remember	—	CO8
20	What are network operator requirements.	Remember	—	CO6
MODULE III				
IoT ARCHITECTURE AND PYTHON				
PART A-PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS				
1	An Architectural Reference Model (ARM) can be visualized as the matrix that eventually derives into a large set of concrete IoT architectures. Justify your answer with neat diagram.	Analyze	Analyze the Architectural Reference Model and visualize as the matrix that eventually derives into a large set of concrete IoT architectures.	CO7
2	In any metamorphic representation IoT ARM can represented in the form of a tree. Represent it and explain its parts and relate to IoT.	Apply	Analyze the Architectural Reference Model and represent in the form of a tree	CO7

3	The foundation of the IoT Reference Model is the IoT Domain Model, which introduces the main concepts of the Internet of Things like Devices, IoT Services and Virtual Entities (VE). Justify your answer with a neat sketch and explain.	Understand	Recall the concept of IOT Architecture and explain IoT Domain Model with introduces the main concepts of the Internet of Things like Devices,IoT	CO7
4	What is the difference between a Python module and a package? Illustrate with an example.	Understand	Recall the concept of python and explain difference between a Python module and a package	CO10
5	How is function overriding implemented in Python? Explain with an example.	Understand	Recall the concept of python and explain function overriding implemented in Python	CO10
6	Difference between physical and virtual entry	Understand	Recall the concept of IOT Architecture and explain the difference between physical and virtual entry	CO7
7	What is the purpose of information model and function model in IoT reference model ?	Understand	Recall the concept of IOT Reference model and explain the purpose of information model and function model	CO7
8	Discuss in detail about IoT reference model with diagram.	Understand	Recall the concept of IOT Architecture and explain IoT reference model with diagram.	CO7
9	Discuss State of the art introduction of IoT architecture?	Understand	Recall the concept of IOT Architecture and explain State of the art introduction of IoT architecture	CO7
10	Explain the IoT-A tree of architectural reference building blocks.	Understand	Recall IoT architecture reference model and find building blocks of IoT tree architecture	CO7
PART-B LONG ANSWER QUESTIONS				
1	Explain IoT reference model.	Understand	Recall IoT reference model and explain in detail.	CO7

2	Demonstrate the IoT architecture with diagram and explain.	Understand	Analyze the concept of IOT Architecture and explain IoT architecture with diagram	CO7
3	Describe the working modules in Python for IoT.	Understand	Analyze how python is used in IoT and explain working modules of Python used for IoT.	CO10
4	Illustrate the IoT data types and data structures in python used with example.	Understand	Analyze how python is used in IoT and explain datatypes and data structures of Python used for IoT.	CO10
5	Explain about i) control flow ii) packages iii) file handling in python.	Understand	—	CO10
6	What type of Architecture reference model is used for IoT explain.	Understand	Analyze the concept of IOT Architecture and explain Architecture reference model	CO7
7	Discuss about communication model and information model in IoT reference model with diagram.	Understand	Recall the concept of IoT reference model with diagram.	CO7
8	What is State of the art introduction of IoT architecture?	Understand	Recall the concept of IOT Architecture and explain State of the art introduction of IoT architecture	CO7
9	Explain about various stages of IoT architecture with neat diagram.	Understand	Recall the concept of IOT Architecture	CO7
10	What is the importance of IoT architecture and explain?	Understand	Recall the concept of IOT Architecture and explain importance of IoT architecture	CO7
11	Explain the IoT architecture reference model (ARM) with neat diagram .	Understand	Recall IoT architecture reference model	CO7
12	Explain in detail about 4 stages of IoT architecture.	Understand	Recall stages of IoT architecture	CO7

13	What is the difference between procedure-oriented programming and object-oriented programming.	Understand	Recall the features of procedure-oriented programming and object-oriented programming languages	CO10
14	Describe a use case of python dictionary?	Understand	Recall the concepts of python	CO10
15	What is the difference between a python module and a package.Explain few IoT packages and modules used.	Understand	Recall the concepts of python	CO10
16	How is function overriding implemented in python.	Understand	Recall the concepts of python	CO10
17	Explain how the stage 1 &2 and Stage 3 & 4 differ by edge in IoT architecture and compare the differences of all the stages.	Understand	Recall stages of IoT architecture	CO7
18	What type of architectural reference model is used for IoT explain.	Understand	Recall stages of IoT architecture	CO7
19	Demonstrate the IoT architecture with a diagram and describe the working modules in python.	Understand	Recall the concept of IoT architecture	CO7,C10
20	Explain IoT functional model and IoT domain model in detail in IoT reference model.	Understand	Recall stages of IoT reference model.	CO7
PART-C SHORT ANSWER QUESTIONS				
1	Define node.	Understand	Recall the concept of IOT Architecture and Define node	CO2
2	What is gateway?	Remember	—	CO2
3	List features of procedure oriented programming?	Remember	—	CO10
4	What is state of art in IoT architecture?	Remember	—	CO2
5	List out various IoT devices used in reference model?	Understand	Recall the concept of IOT architecture and List out various IoT devices used in reference model	CO2
6	Define package?	Remember	—	CO10

7	List features object oriented programming?	Remember	—	CO10
8	What is the use of keyword argument in Python?	Remember	—	CO10
9	What are data types and data structures in python?	Remember	—	CO10
10	Explain working with lists in Python?	Understand	Recall the concepts of python and explain working with lists in Python	CO10
11	What are stages of IoT architecture	Remember	—	CO7
12	Explain procedure for importing packages in python when Raspberry Pi is used in IoT.	Understand	Recall the concepts of python and explain packages used for Raspberry Pi	CO10
14.	What are packages in python.	Remember	—	C10
15	. Differentiate between module and package in python.	Understand	Recall module and package	C10
16.	Explain about the features of Classes in python.	Understand	Recall classes in python	C10
17.	Write short notes on control flows in python?	Understand	Recall classes in python	C10
18.	Explain in detail about functions in python.	Understand	Recall the concepts of functions in python	C10
19.	List and explain various python data types.	Remember	Recall the concepts of datatypes	C10
20.	What are different stages of IoT architecture.	Remember	Recall the concepts of IoT architecture	C07
MODULE IV				
IoT PHYSICAL DEVICES AND ENDPOINTS				
PART A- PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS				
1	How Rasberry Pi different from a desktop computer? Justify your answer with an illustration.	Understand	Analyze different physical devices and justify Rasberry Pi different from a desktop computer	CO9
2	Write a Python program for controlling an LED with a switch.	Understand	Remember the physical devices and construct Python program for controlling an LED with a switch	CO10

3	Explain why energy consumption will be an issue when the Internet of Things is implemented?	Understand	Remember the concept of IoT physical devices and explain why energy consumption will be an issue when the Internet of Things is implemented?	CO6
4	Write a Python program for switching LED/Light based on reading LDR reading.	Understand	Remember the physical devices and construct Python program for switching LED/Light based on reading LDR reading	CO10
5	Which are alternatives to Rasberry Pi? Explain with neat diagram about Raspberry Pi.	Understand	Recall the concept of Raspberry Pi in IoT with a diagram and explain alternatives to Raspberry Pi.	CO9
6.	Write a python script to interface LED and switch with Raspberry Pi	Understand	Recall the concepts of python and Raspberry Pi	C10
7.	How IoT will be used to protect environment loss	Understand	Recall the concepts of IoT applications	C01
8.	Explain about different GPIO pins used in Raspberry Pi	Understand	Recall the concept of Raspberry Pi	C09
9.	Describe the relative strength and limitation of building IOT with RASPERRY PI.	Understand	Recall the concepts of IoT applications and Raspberry Pi	C10
10.	What is the ZigBee protocol? .	Understand	Recall protocols in IoT	C08
PART-B LONG ANSWER QUESTIONS				
1	How Rasberry Pi different from a desktop computer?Explain.	Understand	Recall the concept of Raspberry Pi.	CO9
2	What is Raspberry Pi? Explain Raspberry Pi board with various components?	Understand	Recall the concept of Raspberry Pi.	CO9
3	Discuss Raspberry Pi GPIO with PINs.	Remember	—	CO9
4	Demonstrate Raspberry Pi with interfacing LED.	Understand	Remember the concept of IoT physical devices and explain Raspberry Pi with interfacing LED	CO3,CO10

5	Explain about Raspberry Pi interfaces.(Serial, SPI, I2C)	Understand	Remember the concept of Raspberry Pi and explain Raspberry Pi interfaces	CO9
6	Write a Python program for blinking LED with Raspberry Pi?	Understand	Remember the concept of Raspberry Pi and python	CO10
7	What is the impact of Internet of Things having on Healthcare sector?	Understand	Remember the concept of IoT physical devices and explain impact of Internet of Things having on Healthcare sector	CO7
8	What are the different sectors where the Internet of Things can actually add value to the current processes?	Understand	Remember the concept of IoT physical devices and explain different sectors where the Internet of Things can actually add value to the current processes	CO6
9	Write a Python program for sending an email on a switch press.	Understand	Remember the physical devices and construct Python program for sending an email on switch press.	CO10
10	What are the main challenges of the Internet of Things implementation?	Remember	—	CO1
11	Discuss various building blocks of IoT with help of neat sketch.	Understand	Remember the concept of IoT physical devices and explain various building blocks of IoT with help of neat sketch	CO6
12	Discuss the steps to download Arduino software	Remember	—	CO9
13	Illustrate an LED with Arduino or Raspberry Pi	Understand	Remember the concept of IoT physical devices and Raspberry Pi and Arduino	CO10
14.	Discuss Raspberry Pi GPIO with interfacing LED and switch with Raspberry Pi .	Understand	Recall the concepts of Raspberry Pi	C10
15.	Discuss briefly about SPI and I2C interfaces in Raspberry Pi.	Understand	Recall the concepts of Raspberry Pi	CO9
16.	How is Raspberry Pi used in IoT?	Understand	Recall the concepts of Raspberry Pi	CO9

17.	What are GPIO pins in Raspberry Pi boards.Explain	Understand	Recall the concepts of Raspberry Pi	C10
18.	Write a python program to blink LED using Raspberry Pi.	Understand	Recall the concepts of Raspberry Pi	C10
19.	What is the difference between IoT devices and embedded devices?	Remember	—	C09
20.	What Python libraries used in Raspberry Pi to control GPIO pins?	Understand	Recall the concepts of python and Raspberry Pi	C10
PART-C SHORT ANSWER QUESTIONS				
1	What is Raspberry Pi?	Remember	—	CO9
2	List out the Raspberry Pi interfaces?	Remember	—	CO9
3	Write about Raspberry Pi or any alternative device?	Remember	—	CO9
4	Write the purpose of Serial Raspberry Pi interface?	Remember	—	CO9
5	Write the purpose of SPI Raspberry Pi interface?	Remember	—	CO9
6	Write the purpose of I2C Raspberry Pi interface?	Remember	—	CO9
7	What are the various components/peripherals labeled with the Raspberry Pi board?	Understand	Recall the concept of IoT physical devices and explain various components/peripherals labeled with the Raspberry Pi board	CO9
8	Differentiate between Raspberry Pi and a Desktop computer?	Understand	Recall the concept of IoT physical devices and explain How is Raspberry Pi different from a Desktop computer	CO9
9	What is the use of GPIO pins?	Remember	—	CO4
10	What is Cubie board?	Remember	—	CO9
11	Write short note on pc Duino?	Remember	—	CO9
12	Discuss abot Beagle Bone Black.	Remember	—	CO9

13	Write about Arduino	Understand	Recall the concept of IoT physical devices and explain Arduino	CO9
14	List few modules and packages used in python for IoT applications	Remember	—	CO9
15	Which are alternatives to Rasberry Pi?	Remember	—	CO9
16	What are the different components of a Raspberry Pi board?	Remember	—	C09
17	What are the generations of Raspberry Pi available.	Remember	—	C09
18	How is Raspberry Pi different from Arduino.	Understand	Recall the concepts of Raspberry Pi and Arduino	C09
19	How to take the values from the sensor devices connected to Raspberry Pi using Python program.	Remember	—	C010
20	List available models in Raspberry Pi	Remember	—	C09
MODULE V				
IoT PHYSICAL SERVERS AND CLOUD OFFERINGS				
PART A-PROBLEM SOLVING AND CRITICAL THINKING QUESTIONS)				
1	What is the difference between a Xively data stream and a data channel	Understand	Recall the concepts of IoT applications and Xively cloud	C011
2	Describe the architecture of a Django application.	Understand	Analyze the concept of WAMP and Django frame work.	CO8
3	List few free clouds available for data storage and explain any one in detail.	Understand	Analyze the concept of cloud storage	CO11
4	Extend the functionality of the home intrusion detection IoT system by interfacing a webcam. Implement a function in the controller to capture an image from the webcam and send it as an attachment in the email alert when an intrusion is detected.	Understand	Analyze the concept of python through IoT and explain functionality of the home intrusion detection IoT system by interfacing a webcam	CO11

5	Implement the air pollution monitoring system using the webSocket approach.	Understand	Analyze the concept of python through IoT and explain air pollution monitoring system using the webSocket approach.	CO12
6	Discuss in detail about weather reporting bot	Understand	Recall the concepts of IoT applications	C01
7	Design and discuss the levels of IoT in smart Irrigation.	Understand	Recall the concepts of IoT applications	C01
8	What is WAMP protocol. Explain the WAMP concepts in Transport and RPC model client, RPC router.	Understand	Recall protocols used in IoT	C08
9	Explain the procedure of storing the data in xively cloud for any application	Understand	Recall the concepts of IoT applications and Xively cloud	C011
10	Explain why energy consumption will be an issue when the internet of things is implemented.	Understand	Recall the concepts of IoT devices and their functionality	C09
PART-B LONG ANSWER QUESTIONS				
1	Define WAMP protocol and explain WAMP protocol in detail.	Understand	Recall protocols used in IoT	C08
2	Explain the features of Autobahn and how it is used in WAMP protocol.	Understand	Remember the concept of WAMP and how Autobahn is used	CO8
3	Explain about IoT cloud with home automation.	Understand	Remember the concept of python with IoT and give example to discuss about IoT cloud with home automation	CO11
4	Discuss about the analysis of IoT with smart environment.	Analyze	Analyze IoT levels, protocols and communication models used for building IoT smart environment.	CO2,CO3,CO8
5	Explain about Xively Cloud for IoT.	Understand	Remember the concept of Xively Cloud and Explain about it.	CO11

6	What are the risks and challenges that we should be aware of when it comes to the Internet of Everything?	Understand	Remember the concept of physical servers and explain about risks and challenges	CO1
7	Explain the concept of Home Automation using IoT.	Understand	Recall IoT home automation services	CO9
8	What are the impacts that can be observed in implementing internet of Things on Agriculture sector?	Understand	Remember the concept of physical servers and explain impacts that can be observed in implementing internet of Things on Agriculture sector	CO8
9	What Impacts will the Internet Of Things have on infrastructure and smart cities sector?	Understand	Remember the concept of physical servers and explain Impacts will the Internet Of Things have on infrastructure and smart cities sector	CO8
10	Compare the contrast the difference between Wireless Sensor Network (WSN) and Internet of Things (IoT)?	Remember	—	CO1
11	What is Django architecture? Discuss in detail about WEB application framework.	Understand	Analyze the frameworks used in IoT	CO8
12	Discuss in detail about the concept of Home intrusion detection.	Understand	Recall IoT applications and levels	CO1
13	Extend the functionality of the home intrusion detection IoT system to send email alerts when an intrusion is detected.	Understand	Recall IoT applications	CO1,CO10
14	Distinguish between Web of Things and Internet of Things.	Understand	Recall characteristics of IoT	CO1
15	How to use a service platform while developing IoT applications? Explain with respective to Xively cloud service.	Understand	Recall the concepts of Xively cloud	CO11

16	What impacts will the internet of things have on infrastructures and smart cities sector.	Remember	—	CO1,CO9
17	Explain IOT levels using cloud-based services with example.	Understand	Recall cloud services and IoT levels	CO2,CO11
18	Explain IoT cloud based data collection, storage and computing services.	Understand	Recall cloud services	C011
19	Implement the analytics component for the forest fire detection system.	Analyze	Recall the levels, protocols, communication model and applications.	CO1,CO11,CO12
20	Write a short note on web application messaging protocol.	Understand	Recall IoT protocols	C08
PART-C SHORT ANSWER QUESTIONS				
1	What is WAMP?	Remember	—	CO8
2	Write short note on web application messaging protocol?	Understand	Recall the concept of IoT server and explain web application messaging protocol	CO8
3	Discuss the importance of XML in IoT?	Understand	Recall the concept of IoT server and explain importance of XML in IoT	CO4
4	What is Django framework?	Remember	—	CO8
5	List out the cloud storage models?	Understand	Recall the concept of IoT server and explain cloud storage models	CO11
6	What is Xively cloud service?	Understand	Recall the concept of IoT server and explain Xively cloud service	CO11
7	What is Bot in IoT?	Remember	—	CO1
8	What is Autobahn for IoT?	Understand	Recall the concept of IoT server and explain Autobahn for IoT	CO8
9	What are the features of Autobahn?	Understand	Recall the concept of IoT server and explain features of Autobahn	CO8
10	Write a short note on about Scikit-learn package?	Remember	—	CO10
11	Define WAMP protocol.	Remember	—	CO8

12	Write a note on industrial IoT	Remember	—	CO1
13	What is Xively Cloud.	Remember	—	CO11
14	What are the two roles of client in WAMP.	Remembe	—	CO8
15	What is Django architecture?	Remember	—	CO8
16	What are the main challenges of the internet of things implementation.	Remember	—	CO1
17.	List few applications of IoT.Explain any 2 in detail.	Understand	Recall IoT applications	CO1
18	What is Xively cloud service.	Remember	—	CO11
19	Write the importance Cloud Computing in IoT.	Remember	—	CO11
20	Explain python web application framework(Django)?	Remember	—	CO8

Course Coordinator: **HOD IT**
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