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QUESTION BANK (DESCRIPTIVE)

Subject with Code: INTRODUCTION TO IoT (18EC0449)   **Course & Branch**: B.Tech :EEE,CSE,CSIT,CE

Year &Sem: III-B.Tech & II-Sem   **Regulation:** R18

UNIT –I
IOT INTRODUCTION & CONCEPTS

1	**a**	Define IoT.	[L1][CO1]	**[2M]**
	b	List out the Features of IoT.	[L1][CO1]	**[2M]**
	c	State the characteristics of IoT.	[L1][CO1]	**[2M]**
	d	List out the interfaces used in IoT?	[L1][CO1]	**[2M]**
	e	Define Wireless Sensor Networks.	[L1][CO1]	**[2M]**
2		a) Describe the characteristics of IoT.	[L2] CO1	**[5M]**
		b) Explain the role of things in IoT.	[L2] CO1	**[5M]**
3		a) Mention the applications of IoT.	[L1][CO1]	**[5M]**
		b) Explain various link layer protocols of IoT.	[L1][CO1]	**[5M]**
4		With the help of neat diagrams, describe the levels of IoT with an example each.	[L2] CO1	**[10M]**
5		a) Describe an example of an IoT system in which information and knowledge are inferred from the data.	[L2] CO1	**[5M]**
		b) What are the protocols associated with network/internet layer of IoT? Explain them in detail.	[L1] CO1	**[5M]**
6		a) With a neat sketch, explain the request-response communication model of IoT.	[L2] CO1	**[5M]**
		b) Illustrate the generic block diagram of an IoT device and explain it briefly.	[L2] CO1	**[5M]**
7		a) Compare the protocols associated with transport layer of IoT	[L2] CO1	**[5M]**
		b) With a neat sketch, explain the push-pull communication model of IoT.	[L2] CO1	**[5M]**
8		a) Describe various functional blocks of IoT.	[L2] CO1	**[5M]**
		b) Describe an example of IoT service that uses Web socket-based communication.	[L2] CO1	**[5M]**
9		a) Explain how cloud computing is playing key role in IoT.	[L2] CO1	**[5M]**
		b) What is the technology that performs analysis on data given by the IoT devices? Explain in detail.	[L2] CO1	**[5M]**
10		a) Discuss the role of communication protocols and embedded systems in IoT.	[L2] CO1	**[5M]**
		b) Describe how wireless sensor networks became one of the enabling technologies of IoT.	[L2] CO1	**[5M]**

UNIT –II
DOMAIN SPECIFIC IOTS

1	a	What is a smart home?	[L2][CO2]	**[2M]**
	b	What are the different operating standards for home automation technology?	[L2][CO2]	**[2M]**
	c	What are the elements of a home automation system?	[L2][CO2]	**[2M]**
	d	Why should cities care?	[L3][CO2]	**[2M]**
	e	What is the importance of the Internet of Everything?	[L2][CO2]	**[2M]**
2		a) Define how the IoT technology can be implemented in smart lightening and intrusion detection systems.	[L2][CO2]	**[5M]**
		b) Describe how the IoT technology can be implemented in smart appliances and smoke/gas detection systems.	[L2][CO2]	**[5M]**
3		Explain the implementation of IoT technology in following areas: (i) Smart Parking (ii)Smart Lightening (iii) Emergency response (iv) smart roads in smart cities	[L2][CO2]	**[10M]**
4		Explain how IoT technology can used in the following application areas: (i) Structural health monitoring (ii) Surveillance (iii) Emergency response (iv) Weather monitoring	[L2][CO2]	**[10M]**
5		Describe how the environment can be more protected with the help of IoT technology in the following categories: (i) Air pollution monitoring (ii) Noise pollution monitoring (iii) Forest fire detection (iv) River flood detection	[L3][CO2]	**[10M]**
6		Describe the implementation of IoT technology into distributed energy systems to optimize the efficiency of energy infrastructure and reduce wastage in the following categories: (i) Smart grids (ii) Renewable energy systems (iii) Prognostics.	[L3][CO2]	**[10M]**
7		Explain the necessity of adopting IoT technology for a growing need to increase customer loyalty and deliver the best in-store experience by retail sector in the following sectors: (i) Inventory management (ii) Smart payments (iii) Smart vending machines	[L2][CO2]	**[10M]**
8		With the help of following sectors explain how IoT technology is impacting on the end-to-end value chain in the logistics sector : (i)Route generation & scheduling (ii) Fleet tracking (iii) Shipment monitoring (iv) Remote vehicle diagnostics	[L2][CO2]	**[10M]**
9		Explain how IoT technology used to enable the agricultural industry to increase operational efficiency, lower costs, reduce waste, and improve the quality of their yield.	[L3][CO2]	**[10M]**
10		Explain how the IoT technology is impacting the healthcare sector and changing our everyday lifestyle with the following examples: (i) Health & Fitness monitoring (ii) Wearable electronics	[L3][CO2]	**[10M]**

UNIT –III
IOT AND M2M

1	**a**	What is the difference between M2M and IoT?	[L2][CO3]	**[2M]**
	b	Mention the communication protocols used for M2M local area networks.	[L2][CO3]	**[2M]**
	c	Define Software defined Network	[L2][CO3]	**[2M]**
	d	Define Network Function Virtualization	[L2][CO3]	**[2M]**
	e	List out the key elements of NFV architecture	[L2][CO3]	**[2M]**
2		With the help of neat diagrams, explain the M2M system architecture.	[L2][CO3]	**[10M]**
3		a) Mention the communication protocols used for M2M local area networks.	[L2][CO3]	**[2M]**
		b) Explain the differences between Machines in M2M and Things in IOT?	[L2][CO3]	**[8M]**
4		a) Draw the structure of M2M Gate way Network.	[L3][CO3]	**[3M]**
		b) Describe how SDN can be used for various levels of IoT.	[L2][CO3]	**[7M]**
5		a) Draw the structure of Open flow Switch and justify it?	[L3][CO3]	**[3M]**
		b) Describe how NFV can be used for virtualizing IoT device?	[L3][CO3]	**[7M]**
6		a) Mention the advantages of IoT design methodology contrast to traditional designing of IoT.	[L2][CO3]	**[3M]**
		b) List out the various steps involved in IoT system design methodology.	[L2][CO3]	**[4M]**
		c) What is the difference between a Physical entity and virtual entity?	[L2][CO3]	**[2M]**
7		a) Write a short on various service types used in service specifications step of IoT system design methodology.	[L2][CO3]	**[5M]**
		b) Describe the Domain model specification in IoT system design methodology	[L2][CO3]	**[5M]**
8		Describe the following steps involved in IoT system design methodology: (i) Purpose & Requirements Specification (ii) Process Specification	[L2][CO3]	**[10M]**
9		Describe the following steps involved in IoT system design methodology: (i) Information model Specification (ii) Service Specifications	[L2][CO3]	**[10M]**
10		a) Explain the characteristics of Python programming language.	[L1][CO3]	**[7M]**
		b) Explain Benefits' of python programming language.	[L1][CO3]	**[3M]**

UNIT –IV
IOT PHYSICAL DEVICES & ENDPOINTS

1	a	Explain Raspberry Pi?	[L2][CO4]	**[2M]**
	b	How to run Raspberry pi in headless mode?	[L2][CO4]	**[2M]**
	c	Define Arduino	[L2][CO4]	**[2M]**
	d	Define Micro Python	[L2][CO4]	**[2M]**
	e	List available models in Raspberry Pi	[L2][CO4]	**[2M]**
2		a) With the help of neat diagram explain the basic building blocks of IoT device.	[L4][CO4]	**[5M]**
		b) Justify how Raspberry Pi is different from a desktop computer.	[L4][CO4]	**[5M]**
3		a) Describe various features of a Raspberry Pi device.	[L2][CO4]	**[5M]**
		b) List out various versions of raspberry pi devices till date.	[L2][CO4]	**[5M]**
4		a) What is a module in python? Explain with an example	[L5][CO4]	**[5M]**
		b) Explain in brief about the OOP concepts	[L5][CO4]	**[5M]**
5		a) Mention the flavors of Linux OS supported by Raspberry pi device.	[L2][CO4]	**[5M]**
		b) List the various frequently used commands during operation of Linux OS.	[L2][CO4]	**[5M]**
6		a) Write a short note on various raspberry pi interfaces used for data transfer.	[L2][CO4]	**[5M]**
		b) List out various single board computers which are alternatives to raspberry pi.	[L2][CO4]	**[5M]**
7		a) What is the use of GPIO pins in a IoT device?	[L6][CO4]	**[4M]**
		b) Illustrate how to interface a LED to raspberry pi and write a program to blink	[L6][CO4]	**[6M]**
8		Design an automatic refrigerator light system with LED, switch & raspberry pi and write a python program to support the working of that design.	[L6][CO4]	**[10M]**
9		a) What is the use of SPI and I2C interfaces on raspberry pi?	[L2][CO4]	**[5M]**
		b) Illustrate how to interface a switch to raspberry pi.	[L2][CO4]	**[5M]**
10		a) Illustrate how to interface a Light sensor (LDR) with raspberry pi.	[L2][CO4]	**[4M]**
		b) Design an automatic lightening system with LDR, Light and raspberry pi and write a python program to support the working of that design.	[L2][CO4]	**[6M]**

UNIT –V
CASE STUDIES ILLUSTRATING IOT DESIGN

1	a	List out various versions of raspberry pi devices till date	[L4][CO5]	**[2M]**
	b	What is the use of GPIO pins in a IoT device?	[L6][CO5]	**[2M]**
	c	What is the use of SPI and I2C interfaces on raspberry pi?	[L4][CO5]	**[2M]**
	d	Illustrate how to interface a switch to raspberry pi.	[L4][CO5]	**[2M]**
	e	Write a short note on Light Dependent Resistor.	[L4][CO5]	**[2M]**
2		a) Design a smart home automation system using IoT With mode REST service	[L5][CO5]	**[6M]**
		b) Explain service specification for home automation system in state service	[L4][CO5]	**[4M]**
3		a) Define service specifications for the Intrusion Detection system	[L2][CO5]	**[5M]**
		b) Define Domain model specifications for the Intrusion Detection system	[L2][CO5]	**[5M]**
4		a) Define Process specifications for the Intrusion Detection system	[L2][CO5]	**[5M]**
		b) Define Information model specifications for the Intrusion Detection system	[L4][CO5]	**[5M]**
5		a) Implement the analytics component for the forest fire detection system.	[L4][CO5]	**[5M]**
		b) Write a python code for IoT printer to Raspberry Pi	[L4][CO5]	**[5M]**
6		a) Explain functional and operational view specifications for Home Intrusion detection system?	[L4][CO5]	**[5M]**
		b) Write a python program for room and door REST services using serializes.	[L4][CO5]	**[5M]**
7		a) Explain the purpose of smart parking in cities?	[L2][CO5]	**[5M]**
		b) Define process specification & domain model for smart parking IoT system	[L4][CO5]	**[5M]**
8		a) Write a python program for REST service and smart parking using Django	[L3][CO5]	**[5M]**
		b) Define Information model and controller service for smart parking IoT system	[L4][CO5]	**[5M]**
9		a) Design a weather monitoring IoT system using REST based?	[L4][CO5]	**[5M]**
		b) Design a weather monitoring IoT system using Web Socket based?	[L3][CO5]	**[5M]**
10		a) Implement the air pollution monitoring system using the Web Socket approach	[L6][CO5]	**[5M]**
		b) Implementation of smart irrigation system	[L6][CO5]	**[5M]**

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