SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
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QUESTION BANK (DESCRIPTIVE)

Subject with Code: Embedded Systems and IoT (18EC0440) **Course & Branch**: B.Tech - ECE

Regulation: R18 **Year & Sem:** IV-B.Tech & I-Sem

UNIT –I
INTRODUCTION TO EMBEDDED SYSTEMS

1	**a**	Define embedded system.	[L1][CO1]	**[2M]**
	b	Write any four important characteristics of embedded systems	[L1][CO1]	**[2M]**
	c	Mention the features of Bluetooth interface	[L1][CO1]	**[2M]**
	d	List various types of embedded processors	[L1][CO1]	**[2M]**
	e	What is the function of linker in embedded system development?	[L1][CO1]	**[2M]**
2		Explain the different classifications of embedded systems. Give an example for each.	[L2][CO1]	**[10M]**
3	**a**	Describe about 1-wire and parallel interface.	[L2][CO1]	**[4M]**
	b	With the help of neat block diagram, Explain architecture of embedded system.	[L2][CO1]	**[6M]**
4	**a**	Distinguish between RISC and CISC design.	[L2][CO1]	**[5M]**
	b	List various applications of embedded systems.	[L2][CO1]	**[5M]**
5		Explain the role of following in embedded system i) Oscillator ii) Brownout Protection iii) Embedded Firmware	[L2][CO1]	**[10M]**
6		Explain the role of following circuitry in embedded system i) Reset Circuit ii) Real Time Clock iii) Watchdog Timer	[L2][CO1]	**[10M]**
7	**a**	Compare the operation of Zigbee and Wi-Fi network.	[L2][CO1]	**[5M]**
	b	Explain the GPRS and RS-485 interfaces in embedded systems.	[L2][CO1]	**[5M]**
8		With a neat diagram, explain the design process of an embedded system.	[L2][CO1]	**[10M]**
9	**a**	Write a short note on UART and USB interfaces.	[L1][CO1]	**[4M]**
	b	Write a short note about the following software tools in an embedded system i) Cross-assembler ii) IDE iii) Prototyper	[L1][CO4]	**[6M]**
10	**a**	Explain in brief about the programming languages used for the development of embedded systems	[L2][CO4]	**[5M]**
	b	Distinguish between Von-Neumann and Harvard architecture.	[L2][CO1]	**[5M]**
11	**a**	Explain the differences between I2C and SPI interface	[L2][CO1]	**[4M]**
	b	Explain the following interfaces: i)IEEE1394 ii)IrDA	[L2][CO1]	**[6M]**

UNIT –II
IOT INTRODUCTION & CONCEPTS

1	a	Define IoT.	[L1][CO2]	**[2M]**
	b	List various levels of IOT	[L1][CO2]	**[2M]**
	c	Define protocol	[L1][CO3]	**[2M]**
	d	Compare TCP and UDP	[L4][CO3]	**[2M]**
	e	List out the interfaces used in IoT?	[L1][CO2]	**[2M]**
2	a	Describe the characteristics of IoT.	[L2][CO2]	**[5M]**
	b	Explain the role of things in IoT.	[L2][CO2]	**[5M]**
3	a	Mention the applications of IoT.	[L1][CO3]	**[5M]**
	b	Explain the various link layer protocols of IoT.	[L2][CO3]	**[5M]**
4		With the help of neat diagrams, describe the levels of IoT with an example.	[L2][CO2]	**[10M]**
5	a	Describe an example of an IoT system in which information and knowledge are inferred from the data.	[L2][CO2]	**[5M]**
	b	Classify the protocols associated with network/internet layer of IoT.	[L2][CO3]	**[5M]**
6	a	With a neat sketch, explain the request-response communication model of IoT.	[L2][CO2]	**[5M]**
	b	Illustrate the generic block diagram of an IoT device and explain it briefly.	[L2][CO2]	**[5M]**
7	a	Compare the protocols associated with transport layer of IoT	[L2][CO3]	**[5M]**
	b	With a neat sketch, explain the push-pull communication model of IoT.	[L2][CO2]	**[5M]**
8	a	Describe various functional blocks of IoT.	[L2][CO2]	**[5M]**
	b	Distinguish between Rest API & Web Socket API.	[L2][CO3]	**[5M]**
9	a	Explain the major services used in cloud computing technology.	[L2][CO2]	**[5M]**
	b	Explain the role of Big data analysis in IoT and define its Characteristics.	[L2][CO2]	**[5M]**
10	a	Discuss the role of communication protocols and embedded systems in IoT.	[L2][CO3]	**[5M]**
	b	Describe how wireless sensor networks became one of the enabling technologies of IoT.	[L2][CO2]	**[5M]**
11	a	Define an internet protocol and compare IPV4 and IPV6.	[L1][CO3]	**[5M]**
	b	Compare Transmission protocol and user data gram protocol with diagram.	[L2][CO3]	**[5M]**

UNIT –III
DOMAIN SPECIFIC IOT's & IOT AND M2M

1	a	Mention some of the commonly used water sensors	[L1][CO5]	**[2M]**
	b	What is a smart home?	[L2][CO5]	**[2M]**
	c	What is Thermocouple?	[L2][CO5]	**[2M]**
	d	Mention the communication protocols used for M2M local area networks.	[L1][CO3]	**[2M]**
	e	Define Software defined Network	[L1][CO3]	**[2M]**
2	a	Describe the structure of Network function Virtualization for IoT.	[L2][CO3]	**[5M]**
	b	Explain the key elements of Network function Virtualization for IoT.	[L2][CO3]	**[5M]**
3	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][CO3]	**[5M]**
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][CO3]	**[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][CO3]	**[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][CO3]	**[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][CO3]	**[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][CO3]	**[10M]**
9	a	Draw the structure of Software defined networking for IoT & Explain it	[L3][CO3]	**[5M]**
	b	Explain the Key elements of Software defined network for IoT.	[L3][CO3]	**[5M]**
10		With the help of neat diagrams, explain the M2M system architecture.	[L2][CO2]	**[10M]**
11	a	Mention the communication protocols used for M2M local area networks.	[L2][CO3]	**[5M]**
	b	Explain the differences between Machines in M2M and Things in IoT.	[L2][CO3]	**[5M]**

UNIT –IV
DEVELOPING INTERNET OF THINGS

1	**a**	List the statements in Python.	[L1][CO4]	**[2M]**
	b	Write a short notes on file handling.	[L1][CO4]	**[2M]**
	c	Define iteration.	[L1][CO4]	**[2M]**
	d	Define Process specifications.	[L1][CO4]	**[2M]**
	e	What is the purpose of Information Model?	[L2][CO4]	**[2M]**
2	a	List out the various steps involved in IoT system design methodology.	[L1][CO4]	**[5M]**
	b	Distinguish between a Physical entity and virtual entity.	[L2][CO3]	**[5M]**
3		Describe the following steps involved in IoT system design methodology: (i) Purpose & Requirements Specification (ii) Process Specification	[L2][CO2]	**[10M]**
4		Describe the following steps involved in IoT system design methodology: (i) Information model Specification (ii) Service Specifications	[L2][CO2]	**[10M]**
5	**a**	Explain the characteristics of Python programming language.	[L2][CO4]	**[5M]**
	b	Distinguish between procedure-oriented programming and object-oriented programming.	[L2][CO4]	**[5M]**
6	**a**	Write a short on various service types used in service specifications step of IoT system design methodology	[L1][CO2]	**[5M]**
	b	Mention the advantages of IoT design methodology contrast to traditional designing of IoT.	[L1][CO2]	**[5M]**
7		Explain the following data types of python with an example. (i) Numbers (ii) Strings	[L2][CO4]	**[10M]**
8		Explain the following data types of python with an example: (i) Tuples (ii) Dictionaries	[L2][CO4]	**[10M]**
9		Explain the following data types of python with an example: (i) Type conversions (ii) Lists	[L2][CO4]	**[10M]**
10	**a**	Describe the packages used in python.	[L3][CO4]	**[5M]**
	b	Explain the function with default arguments, passing by reference, keyword arguments and variable length arguments with an example each.	[L3][CO4]	**[5M]**
11	**a**	Elaborate the principles of Object-Oriented Programming.	[L3][CO4]	**[5M]**
	b	Explain about the classes in python with some examples.	[L3][CO4]	**[5M]**

UNIT –V
IOT PHYSICAL DEVICES & ENDPOINTS

1	a	List out various versions of raspberry pi devices till date.	[L1][CO5]	**[2M]**
	b	Write a short note on Light Dependent Resistor.	[L1][CO5]	**[2M]**
	c	What is the use of GPIO pins in a IoT device?	[L2][CO5]	**[2M]**
	d	Write a short note on PIR sensor.	[L1][CO5]	**[2M]**
	e	Write about the sensor and give an example.	[L1][CO5]	**[2M]**
2	a	With the help of neat diagram explain the basic building blocks of IoT device.	[L2][CO4]	**[6M]**
	b	Justify how Raspberry Pi is different from a desktop computer.	[L5][CO5]	**[4M]**
3	a	Describe the various features of a Raspberry Pi device.	[L2][CO5]	**[6M]**
	b	Classify the various versions of raspberry pi devices till date.	[L1][CO5]	**[4M]**
4	a	Explain an IoT device & give some examples.	[L2][CO4]	**[5M]**
	b	Explain the GPIO pins of Raspberry Pi device with neat diagram.	[L2][CO5]	**[5M]**
5	a	What is a module in python? Explain with an example.	[L2][CO4]	**[5M]**
	b	Explain in brief about the Object-Oriented Programming concepts.	[L2][CO4]	**[5M]**
6	a	Mention the flavors of Linux OS supported by Raspberry pi device.	[L1][CO5]	**[3M]**
	b	Classify the various frequently used commands during operation of Linux OS.	[L2][CO4]	**[7M]**
7	a	Write a short note on various raspberry pi interfaces used for data transfer.	[L1][CO4]	**[3M]**
	b	Compare the various single board computers which are alternatives to Raspberry pi.	[L2][CO4]	**[7M]**
8	a	Design an automatic motion light system using raspberry pi and write a python program to support the working of that design.	[L6][CO5,6]	**[5M]**
	b	Illustrate how to interface a LED to raspberry pi and write a program to blink	[L6][CO5]	**[5M]**
9		Design an automatic refrigerator light system with LED, switch & raspberry pi and write a python program to support the working of that design.	[L6][CO5,6]	**[5M]**
10	a	Explain the use of SPI and I2C interfaces on raspberry pi?	[L2][CO5]	**[4M]**
	b	Illustrate how to interface a switch to raspberry pi.	[L2][CO5]	**[6M]**
11	a	Illustrate how to interface a Light sensor (LDR) with raspberry pi.	[L2][CO5]	**[5M]**
	b	Design an automatic lightening system with LDR, Light and raspberry pi and write a python program to support the working of that design.	[L6][CO5,6]	**[5M]**

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