

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR (AUTONOMOUS) Siddharth Nagar, Narayanavanam Road – 517583 <u>OUESTION BANK (DESCRIPTIVE)</u>

Subject with Code: Embedded Systems and IoT (18EC0440)

Regulation: R18

Course & Branch: B.Tech - ECE Year & Sem: IV-B.Tech & I-Sem

UNIT –I INTRODUCTION TO EMBEDDED SYSTEMS

			FT 110011	[0] []
	a	Define embedded system.	[L1][CO1]	[2M]
	b	Write any four important characteristics of embedded systems	[L1][CO1]	[2M]
1	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	Exp	blain 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]
3	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]
4	b	List various applications of embedded systems.	[L2][CO1]	[5M]
5	Exp	blain the role of following in embedded system		[10]/[]
Э	i) C	Oscillator ii) Brownout Protection iii) Embedded Firmware	[L2][CO1]	[10M]
6	Exp	plain the role of following circuitry in embedded system		[10]/[]
0	i) R	teset 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	Wit	h a neat diagram, explain the design process of an embedded system.	[L2][CO1]	[10M]
	a	Write a short note on UART and USB interfaces.	[L1][CO1]	[4M]
9	h	Write a short note about the following software tools in an embedded system		
	b	i) Cross-assembler ii) IDE iii) Prototyper	[L1][CO4]	[6M]
	a	Explain in brief about the programming languages used for the development of		[5]M]
10		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]
11	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]
	С	Define protocol	[L1][CO3]	[2M]
	d	Compare TCP and UDP	[L4][CO3]	[2M]
	e	List out the interfaces used in IoT?	[L1][CO2]	[2M]
	a	Describe the characteristics of IoT.	[L2][CO2]	[5M]
2	b	Explain the role of things in IoT.	[L2][CO2]	[5M]
	a	Mention the applications of IoT.	[L1][CO3]	[5M]
3	b	Explain the various link layer protocols of IoT.	[L2][CO3]	[5M]
4	W	ith the help of neat diagrams, describe the levels of IoT with an example.	[L2][CO2]	[10M]
	_	Describe an example of an IoT system in which information and knowledge are	[L2][CO2]	[5M]
5	a	inferred from the data.		
	b	Classify the protocols associated with network/internet layer of IoT.	[L2][CO3]	[5M]
	a	With a neat sketch, explain the request-response communication model of IoT.	[L2][CO2]	[5M]
6	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]
0	a	Describe various functional blocks of IoT.	[L2][CO2]	[5M]
8	b	Distinguish between Rest API & Web Socket API.	[L2][CO3]	[5M]
0	a	Explain the major services used in cloud computing technology.	[L2][CO2]	[5M]
9	b	Explain the role of Big data analysis in IoT and define its Characteristics.	[L2][CO2]	[5M]
	a	Discuss the role of communication protocols and embedded systems in IoT.	[L2][CO3]	[5M]
10	b	Describe how wireless sensor networks became one of the enabling technologies	[L2][CO2]	[5M]
		of IoT.		
11	a	Define an internet protocol and compare IPV4 and IPV6.	[L1][CO3]	[5M]
11	b	Compare Transmission protocol and user data gram protocol with diagram.	[L2][CO3]	[5M]
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UNIT –III DOMAIN SPECIFIC IOT'S & IOT AND M2M

bWhat is a smart home?[L2][CO5][2M]cWhat is Thermocouple?[L2][CO5][2M]dMention the communication protocols used for M2M local area networks.[L1][CO3][2M]eDefine Software defined Network[L1][CO3][2M]aDescribe the structure of Network function Virtualization for IoT.[L2][CO3][5M]aDefine how the IoT technology can be implemented in smart lightening and intrusion detection systems.[L2][CO3][5M]aDefine how the IoT technology can be implemented in smart appliances and smoke/gas detection systems.[L2][CO3][5M]bExplain how IoT technology can used in the following application areas:[L2][CO3][10M](ii) Emergency response(iv) Weather monitoring[L2][CO3][10M](iii) Emergency response(iv) Weather monitoring[L3][CO3][10M](iii) Forest fire detection(iv) River flood detection[L3][CO3][10M](iii) Forest fire detection(iv) River flood detection[L3][CO3][10M](i) Smart grids (ii) Renewable energy systems (iii) Prognostics.[L3][CO3][10M](i) Inventory management (ii) Smart payments (iii) Smart vending machines[L2][CO3][10M](ii) Inventory management (iii) Smart payments (iii) Smart vending machines[L2][CO3][10M](i) Inventory management (iii) Smart payments (iii) Smart vending machines[L2][CO3][10M](ii) Note generation & Scheduling (ii) Fleet tracking[L2][CO3][10M](iii) Rue envable energy system school si inducts en		a Mention some of the commonly used water sensors	[L1][CO5]	[2M]
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8 end-to-end value chain in the logistics sector : [L2][CO3] [10M] (i)Route generation & scheduling (ii) Fleet tracking (ii) Shipment monitoring (iv) Remote vehicle diagnostics [L2][CO3] [5M] 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]				
8 (i)Route generation & scheduling (ii) Fleet tracking (iii) Shipment monitoring (iv) Remote vehicle diagnostics [L2][CO3] [I0M] 9 a Draw the structure of Software defined networking for IoT & Explain it [L3][CO3] [5M] 9 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]				
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a Mention the communication protocols used for M2M local area networks. [L2][CO3] [5M]	10			[10M]
I I	11			[5M]
D Explain the differences between Machines in M2M and Things in 101.		b Explain the differences between Machines in M2M and Things in IoT.	[L2][CO3]	[5M]



UNIT –IV DEVELOPING INTERNET OF THINGS

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



R18

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

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