Course Code: 19EC0427 **R19**

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY

(AUTONOMOUS)

(Approved by AICTE, New Delhi& Affiliated to JNTUA, Ananthapuramu)
(Accredited by NBA for , EEE, Mech., ECE & CSE)
(Accredited by NAAC with 'A' Grade)
Puttur -517583, Chittoor District, A.P. (India)

QUESTION BANK (DESCRIPTIVE)

SUBJECT WITH CODE:	EMBEDDEDSYSTEMS AND IOT(19EC0427)	**COURSE & BRANCH:**	B.Tech - ECE
YEAR & SEM:	IV & I	**REGULATION:**	R19

UNIT–I
INTRODUCTIONTOEMBEDDEDSYSTEMS

1	**a**	Define embedded system and various processors types of embedded processors.	[L1][CO1]	**[06M]**
	b	Distinguish between Von-Neumann and Harvard architecture.	[L2][CO1]	**[06M]**
2		Explain the different classifications of embedded systems. Give an example for each.	[L2][CO1]	**[12M]**
3	**a**	Distinguish between RISC and CISC design.	[L2][CO1]	**[06M]**
	b	List various applications of embedded systems.	[L1][CO1]	**[06M]**
4	**a**	Explain I2C ,SPI and Write Comparison between Serial and parallel interface	[L2][CO1]	**[06M]**
	b	With the neat sketch, Explain architecture of embedded system.	[L3][CO1]	**[06M]**
5		Explain the role of following in embedded system i)Oscillator ii)Brownout Protection iii)Embedded Firmware	[L2][CO1]	**[12M]**
6		Explain the role of following circuitry in embedded system i)Reset Circuit ii) Real Time Clock iii) Watchdog Timer	[L2][CO1]	**[12M]**
7	**a**	Compare the operation of Zigbee and Wi-Fi network.	[L2][CO1]	**[06M]**
	b	Explain the GPRS , RS232 and RS-485 interfaces in embedded systems.	[L2][CO1]	**[6M]**
8	With a neat diagram, explain the design process of an embedded system.		[L2][CO1]	**[12M]**
9	**a**	Write a short note on i) UART ii) USB interfaces iii) 1-wire interface	[L1][CO1]	**[06M]**
	b	Write a short note about the following software tools in an embeddedsystem i)Cross-assembler ii)IDE iii)Prototyper	[L1][CO1]	**[06M]**
10	**a**	Explain in brief about the programming languages used for the development of Embedded systems	[L2][CO1]	**[06M]**
	b	Explain the following interfaces: i)IEEE1394 ii)IrDA iii) Bluetooth	[L1][CO1]	**[06M]**

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UNIT–II

IOTINTRODUCTION&CONCEPTS

1	**a**	Define IoT and its characteristics and application of Internet of Things.	[L1][CO2]	**[06M]**
	b	Illustrate the Physical design with an generic block diagram of an IoT device and explain it briefly.	[L2][CO2]	**[06M]**
2	**a**	Classify the protocols associated with network/internet layer of IoT.	[L2][CO3]	**[06M]**
	b	Explain the various link layer protocols of IoT.	[L2][CO3]	**[06M]**
3		With the help of neat diagrams, describe the levels of IoT and Deployment Templates with an example.	[L1][CO2]	**[12M]**
4	a	With a neat sketch, explain the communication model of IoT.	[L3][CO2]	**[06M]**
	b	With a neat sketch, explain the Logical Design of an IoT.	[L3][CO2]	**[06M]**
5	**a**	Compare the protocols associated with transport layer of IoT	[L2][CO3]	**[06M]**
	b	Explain the IoT enabling technology such as wireless sensor network and Cloud Computing IoT and define its Characteristics	[L2][CO2]	**[06M]**
6	**a**	How the IoT technology can be implemented in Home automation such as smart lightening and intrusion detection systems?	[L2][CO2]	**[06M]**
	b	How the IoT technology can be implemented in smart appliances and smoke/gas detection systems?	[L2][CO2]	**[06M]**
7	**a**	Explain how IoT technology can used in the following application areas: (i)Structural health monitoring (ii)Emergency response	[L2][CO2]	**[06M]**
	b	Explain how IoT technology can used in the following application areas: (i)Surveillance (ii)Weather monitoring	[L2][CO2]	**[06M]**
8		Describe how the environment can be more protected with the help of IoT technology the following categories: (i)Air pollution monitoring (ii)Noise pollution monitoring (iii)Forest fire detection (iv)River flood detection	[L2][CO2]	**[12M]**
9	**a**	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.	[L2][CO2]	**[08M]**
	b	b) Explain how IoT technology can used in the Industry: i) Machine Diagnosis& Prognosis ii)Indoor Air Quality Monitoring	[L2][CO2]	**[04M]**
10	**a**	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]	**[08M]**
	b	Describe the implementation of IoT technology in Health and life style as health and fitness monitoring	[L2][CO2]	**[04M]**
11	**a**	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)Remote vehicle diagnostics	[L2][CO2]	**[06M]**
	b	With the help of following sectors explain how IoT technology is impacting on the agriculture sector:(i) Smart Irrigation (ii) Green house control	[L2][CO2]	**[06M]**

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UNIT–III

IOTANDM2M AND INTRODUCTION TO ARDUINO

1	**a**	Explain the differences between Machines in M2M and Things in IoT.	[L2][CO3]	**[06M]**
	b	Mention the communication protocols used for M2M local area networks.	[L1] [CO3]	**[06M]**
2	**a**	Describe the structure of Network function Virtualization for IoT.	[L2][CO3]	**[06M]**
	b	Explain the key elements of Network function Virtualization for IoT.	[L2][CO3]	**[06M]**
3	**a**	Draw the structure of Software defined networking for IoT &Explain it	[L2][CO3]	**[06M]**
	b	Explain the Key elements of Software defined network for IoT.	[L2][CO3]	**[06M]**
4		With the help of neat diagrams, explain the M2M system architecture.	[L2][CO2]	**[12M]**
5		Explain in detail about Arduino board and I/O pins with a neat sketch	[L2][CO3]	**[12M]**
6	**a**	What is Arduino and list its advantages?	[L2][CO3]	**[06M]**
	b	In which language Arduino software was written and also elaborate the software structure functions.	[L2][CO3]	**[06M]**
7	**a**	Develop a program for LCD and Keyboard programming interface for an Arduino	[L3][CO3]	**[06M]**
	b	Construct a program in Arduino to work as a counter	[L3][CO3]	**[06M]**
8	**a**	Write a program to produce a Interrupt in Arduino	[L3][CO3]	**[06M]**
	b	Formulate a program to interface I2C with DAC programming for Arduino	[L3][CO3]	**[06M]**
9	**a**	Write a suitable program to interface Stepper motor with Arduino processor	[L3][CO3]	**[06M]**
	b	Develop a program to control DC motor using PWM technique	[L3][CO3]	**[06M]**
10	**a**	Write a program to perform ADC with the sensor inputs	[L3][CO3]	**[06M]**
	b	Write a program for Arduino to work as a Timer.	[L3][CO3]	**[06M]**

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UNIT–IV

DEVELOPING INTERNET OF THINGS

1	**a**	List out the various steps involved in IoT system design methodology.	[L1][CO4]	**[06M]**
	b	Distinguish between a Physical entity and virtual entity.	[L2][CO4]	**[06M]**
2		Describe the following steps involved in IoT system design methodology: (i)Purpose & Requirements Specification (ii)Process Specification	[L2][CO4]	**[12M]**
3		Describe the following steps involved in IoT system design methodology: (i)Information model Specification (ii)Service Specifications	[L2][CO4]	**[12M]**
4	**a**	Explain the characteristics of Python programming language.	[L2][CO4]	**[06M]**
	b	Distinguish between procedure-oriented programming and object-oriented Programming.	[L2][CO4]	**[06M]**
5	**a**	Write a short on various service types used in service specifications step of IoT System design methodology	[L1][CO4]	**[06M]**
	b	Mention the advantages of IoT design methodology contrast to traditional Designing of IoT.	[L2][CO4]	**[06M]**
6	a	Explain the following data types and data structures of python with an example. (i) Numbers (ii) Strings iii)Tuples iv)Dictionaries	[L2][CO4]	**[08M]**
	b	Explain Functions and Modules in python with an example	[L2][CO4]	**[04M]**
7		Explain the control flow statements such as if ,for, while and Range with an example	[L2][CO4]	**[12M]**
8		Explain the following data types of python with an example: (i)Type conversions (ii)Lists	[L2][CO4]	**[12M]**
9	**a**	Describe the packages used in python.	[L2][CO4]	**[06M]**
	b	Explain the function with default arguments, passing by reference ,keyword Arguments and variable length arguments with an example each.	[L2][CO4]	**[06M]**
10	**a**	Explain File handling and date/time operations in python with an example.	[L2][CO4]	**[06M]**
	b	Explain about the classes in python with some examples.	[L2][CO4]	**[06M]**

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UNIT–V

IOT PHYSICAL DEVICES & END POINTS

1	**a**	With the help of neat diagram explain the basic building blocks of IoT device.	[L2][CO4]	**[06M]**
	b	Justify how Raspberry Pi is different from a desktop computer.	[L4][CO5]	**[06M]**
2	**a**	Describe the various features of a Raspberry Pi board.	[L2][CO4]	**[06M]**
	b	Classify the various versions of raspberry pi device still date.	[L4][CO5]	**[06M]**
3	**a**	Explain an IoT device & give some examples.	[L2][CO4]	**[06M]**
	b	Explain the GPIO pins of Raspberry Pi device with neat diagram.	[L2][CO5]	**[06M]**
4	**a**	What is a module in python? Explain with an example.	[L1][CO5]	**[06M]**
	b	Explain in brie about the Object-Oriented Programming concepts.	[L2][CO4]	**[06M]**
5	**a**	Mention the flavors of Linux OS supported by Raspberry pi device.	[L1][CO4]	**[05M]**
	b	Classify the various frequently used commands during operation of Linux OS.	[L4][CO4]	**[07M]**
6	**a**	Write a short note on various raspberry pi interfaces used for data transfer.	[L1][CO5]	**[05M]**
	b	Compare the various single board computers which are alternatives to Raspberry pi.	[L4][CO5]	**[07M]**
7	**a**	Design and Development of an automatic motion light system using raspberry pi and write a python Program to support the working of that design.	[L3][CO6]	**[06M]**
	b	Illustrate how to interface a LED to raspberry pi and write a program to blink	[L3][CO6]	**[06M]**
8	Design and Development of an automatic refrigerator light system with LED, switch & raspberry pi and write a python program to support the working of that design.		[L3][CO6]	**[12M]**
9	**a**	Explain the use of SPI and I2C interfaces on raspberry pi?	[L2][CO5]	**[06M]**
	b	Illustrate how to interface a switch to raspberry pi.	[L3][CO6]	**[06M]**
10	**a**	Illustrate how to interface a Light sensor (LDR) with raspberry pi.	[L3][CO6]	**[06M]**
	b	Design an automatic lightening system with LDR, Light and raspberry pi and Write a python program to support the working of that design.	[L3][CO6]	**[06M]**

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