

SIDDARTHA INSTITUTE OF SCIENCE AND TECHNOLOGY :: PUTTUR

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**QUESTION BANK (DESCRIPTIVE)****Subject with Code:** Embedded Systems and IoT (18EC0440)**Course & Branch:** B.Tech & ECE**Year & Sem:** IV-B.Tech & I-Sem**Regulation:** R18**UNIT –I**

1.	a) Define embedded system.	[L1][CO1]	[2M]
	b) State any four important characteristics of embedded systems	[L1][CO1]	[2M]
	c) List 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.	[L1][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) Discuss on UART and USB interfaces.	[L1][CO1]	[4M]
	b) Discuss about the following software tools in an embedded system i) Cross-assembler ii) IDE iii) Prototype	[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	[L2] [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) list 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.	[L3] [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.	[L2] [CO3]	[5M]
	b) Compare Transmission protocol and user data gram protocol with diagram.	[L4] [CO3]	[5M]

UNIT –III
DOMAIN SPECIFIC IOTS & IOT AND M2M

1	a) List the commonly used water sensors	[L1] [CO5]	[2M]
	b) What is a smart home?	[L1] [CO5]	[2M]
	c) What is Thermocouple?	[L1] [CO5]	[2M]
	d) List 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) Explain 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	[L2][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.	[L2][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) Sketch the structure of Software defined networking for IoT & Explain it	[L3][CO3]	[5M]
	b) Explain the Key elements of Software defined network for IoT.	[L2][CO3]	[5M]
10	With the help of neat diagrams, explain the M2M system architecture.	[L2][CO2]	[10M]
11	a) Describe 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) Describe in brief about file handling.	[L2][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.	[L4][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.	[L4][CO4]	[5M]
6	a) Describe the various service types used in service specifications step of IoT system design methodology	[L2][CO2]	[5M]
	b) list the advantages of IoT design methodology contrast to traditional designing of IoT.	[L2][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.	[L2][CO4]	[5M]
	b) Explain the function with default arguments, passing by reference, keyword arguments and variable length arguments with an example each.	[L2][CO4]	[5M]
11	a) Describe the principles of Object-Oriented Programming.	[L2][CO4]	[5M]
	b) Explain about the classes in python with some examples.	[L2][CO4]	[5M]

UNIT –V
IOT PHYSICAL DEVICES & ENDPOINTS

1	a) List out various versions of raspberry pi devices till date.	[L1][CO5]	[2M]
	b) Describe in brief about Light Dependent Resistor.	[L2][CO5]	[2M]
	c) What is the use of GPIO pins in a IoT device?	[L1][CO5]	[2M]
	d) Explain in brief PIR sensor.	[L2][CO5]	[2M]
	e) Define the sensor and give an example.	[L1][CO5]	[2M]
2	a) With the help of neat sketch explain the basic building blocks of IoT device.	[L3][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.	[L2][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) List 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) Explain in brief 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	[L3][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.	[L3][CO5]	[6M]
11	a) Illustrate how to interface a Light sensor (LDR) with raspberry pi.	[L3][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]