SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
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Puttur -517583, Tirupati District, A.P. (India)

QUESTION BANK (DESCRIPTIVE)

Subject with Code	DESIGNING THE INTERNET OF THINGS (23CS1003)	Course & Branch	B.Tech & CIC
Year & Sem	III YEAR & I SEM	Regulation	R23

UNIT –I

DESIGN PRINCIPLES OF IOT

1	a	What are the key components of a connected device?	[L1][CO1]	[2M]
	b	What is meant by data acquisition in IoT?	[L2][CO2]	[2M]
	c	What is the role of analytics in IoT?	[L2][CO2]	[2M]
	d	Give two examples of data analytics techniques used in IoT.	[L1][CO2]	[2M]
	e	What is meant by "data organization" in IoT?	[L2][CO2]	[2M]
2		Explain in detail the design principles of connected devices in IoT systems	[L2][CO1]	[10M]
3	a	Explain briefly about that Modified OSI model for IOT/M2M systems	[L2][CO2]	[5M]
	b	Explain briefly about ITU-T Reference Model	[L2][CO3]	[5M]
4	a	Explain briefly about ETSI M2M Domains and High-level Capabilities	[L2][CO3]	[5M]
	b	Define wired communication and wireless communication.	[L1][CO1]	[5M]
5	a	Describe how data is acquired from IoT devices.	[L2][CO2]	[5M]
	b	Write short notes on Data Categorization for storage and Data Store in IoT devices.	[L2][CO3]	[5M]
6		Explain the process of data acquisition in IoT systems.	[L4][CO2]	[10M]
7	a	Write down the differences between SQL and NOSQL	[L4][CO2]	[5M]
	b	Write down the differences between Flat file and Relational Databases	[L2][CO1]	[5M]
8		Explain the process of data organizing in IoT systems.	[L4][CO2]	[10M]
9	a	Compare Data Organizing and Data Analytics in IOT	[L4][CO3]	[5M]
	b	Differentiate between Descriptive and Predictive analytics in IoT.	[L4][CO2]	[5M]
10		Explain the process of Data Analytics using Big Data in IoT systems.	[L4][CO2]	[10M]
11		Briefly discuss the Architecture of IoT.	[L4][CO2]	[10M]

UNIT –II
PROTOTYPING THE EMBEDDED DEVICES FOR
IOT

1	a	Name two prototyping platforms used in IoT.	[L1][CO1]	[2M]
	b	Define sensor and actuator with one example each.	[L1][CO2]	[2M]
	c	Define Wireless Sensor Network (WSN).	[L1][CO3]	[2M]
	d	What is the function of an IoT gateway?	[L2][CO4]	[2M]
	e	What is the role of data analytics in IoT?	[L2][CO5]	[2M]
2		Describe the architecture and components of an IoT prototyping platform.	[L3][CO1]	[10M]
3	a	Explain any two types of IoT prototyping.	[L3][CO5]	[5M]
	b	Differentiate between sensors and Actuators.	[L4][CO2]	[5M]
4	a	Describe sensors and actuators in IoT.	[L2][CO6]	[5M]
	b	Explain briefly about radio modules in IoT devices.	[L2][CO6]	[5M]
5	a	Explain the role of gateways in an IoT system.	[L2][CO4]	[5M]
	b	Describe the architecture of a basic Wireless Sensor Network (WSN).	[L2][CO3]	[5M]
6		Explain briefly about software components for IoT.	[L2][CO4]	[10M]
7	a	Explain the role of actuators in a smart irrigation system.	[L3][CO2]	[5M]
	b	Explain gateways role in IoT internet connectivity.	[L3][CO6]	[5M]
8		Discuss about challenges in IoT hardware prototyping.	[L4][CO5]	[10M]
9	a	What is MQTT? Explain its importance in IoT applications.	[L3][CO4]	[5M]
	b	Briefly describe the software stack of an IoT system.	[L2][CO5]	[5M]
10		Explain briefly about the IoT device prototyping considerations.	[L4][CO5]	[10M]
11	a	Describe the function of an IoT middleware with an example.	[L2][CO5]	[5M]
	b	List and explain any two cloud platforms used for IoT.	[L1][CO5]	[5M]

UNIT –III

EMBEDDED PROGRAMMING FOR IOT

1	a	What is an embedded system in the context of IoT?	[L2][CO1]	[2M]
	b	List two protocols used for communication in IoT devices.	[L1][CO1]	[2M]
	c	What are the advantages of using C for embedded systems?	[L2][CO3]	[2M]
	d	Mention any two Python libraries used for IoT programming.	[L1][CO2]	[2M]
	e	List two sensors used in a smart irrigation system.	[L1][CO4]	[2M]
2		Explain briefly about embedded programming for IoT devices.	[L2][CO4]	[10M]
3	a	Describe the differences between using C and Python for programming IoT.	[L4][CO2]	[5M]
	b	Explain Benefits of python programming language.	[L2][CO3]	[5M]
4		Compare and contrast C and Python for IoT embedded devices.	[L4][CO2]	[10M]
5	a	What is a module in python? Explain with an example	[L2][CO4]	[5M]
	b	Explain the characteristics of Python programming language.	[L2][CO3]	[5M]
6		Design an automatic refrigerator light system with LED, switch & raspberry pi and write a python program to support the working of that design.	[L3][CO4]	[10M]
7	a	Explain the characteristics of Python programming language.	[L2][CO3]	[5M]
	b	Design an embedded temperature controller system using C language.	[L6][CO3]	[5M]
8		Describe the data flow from sensing to cloud storage in an IoT temperature monitoring system.	[L4][CO4]	[10M]
9	a	Describe the working principle of an IoT-based temperature controller system.	[L6][CO4]	[5M]
	b	Write a short Python script to read temperature from a DHT11 sensor.	[L2][CO4]	[5M]
10	a	List the hardware components required to build a smart irrigation system.	[L1][CO4]	[5M]
	b	Explain how soil moisture level is monitored and how it triggers water pump activation in a smart irrigation system.	[L4][CO4]	[5M]
11	a	Explain the architecture and working of a smart irrigation system using a soil moisture sensor.	[L1][CO4]	[5M]
	b	Implementation of smart irrigation system	[L3][CO6]	[5M]

UNIT –IV

EMBEDDED RTOS

1	a	Define an RTOS.	[L1][CO1]	[2M]
	b	What are the key components of an RTOS?	[L2][CO1]	[2M]
	c	Define semaphore and its purpose in RTOS.	[L2][CO3]	[2M]
	d	List any two features of Nucleus SE.	[L1][CO4]	[2M]
	e	What is the role of the startup code in Nucleus SE initialization?	[L2][CO4]	[2M]
2	a	Explain the basic program structure of an Embedded RTOS.	[L2][CO1]	[5M]
	b	Define real-time, multi-tasking and explain how scheduling works in RTOS.	[L2][CO2]	[5M]
3	a	What are the different types of RTOS services? Briefly explain with examples.	[L1][CO3]	[5M]
	b	explain how scheduling works in RTOS.	[L2][CO1]	[5M]
4		Explain multi-tasking and various scheduling techniques used in RTOS.	[L4][CO2]	[10M]
5	a	Explain briefly about RTOS services in IoT.	[L2][CO4]	[5M]
	b	Differentiate between signals and semaphores in RTOS.	[L4][CO4]	[5M]
6		Explain the working of signals and semaphores in an RTOS.	[L3][CO4]	[10M]
7	a	Describe semaphores in RTOS.	[L2][CO4]	[5M]
	b	How do RTOS manage tasks in IoT?	[L4][CO4]	[5M]
8		Write a detailed note on Nucleus SE RTOS. Discuss its architecture, features in embedded applications.	[L2][CO5]	[10M]
9	a	Explain the use and working of application timers in Nucleus SE.	[L3][CO6]	[5M]
	b	Write short notes on Nucleus SE and its features.	[L2][CO5]	[5M]
10		Describe how interrupts are handled in Nucleus SE.	[L4][CO6]	[10M]
11	a	What is the role of the starn1p file in Nucleus SE system initialization?	[L4][CO6]	[5M]
	b	Compare cooperative and preemptive scheduling in RTOS.	[L5][CO2]	[5M]

UNIT –V

IoT Tools and Physical Devices

1	a	What is the role of software tools in IoT development?	[L1][CO1]	[2M]
	b	What is Chef in the context of IoT?	[L2][CO2]	[2M]
	c	What is NETCONF used for in IoT networks?	[L2][CO2]	[2M]
	d	Give two examples of IoT development boards.	[L1][CO4]	[2M]
	e	What is the importance of domain-specific customization in IoT?	[L3][CO5]	[2M]
2		Discuss the use of Chef and Puppet in automating IoT device configuration.	[L3][CO2]	[10M]
3	a	Define IoT. List any four tools used in IoT development.	[L1][CO1]	[5M]
	b	What is the role of Chef and Puppet in IoT deployment?	[L2][CO2]	[5M]
4		Explain the NETCONF-YANG architecture and its use in IoT device management.	[L3][CO2]	[10M]
5	a	List and explain the basic building blocks of an IoT device.	[L2][CO1]	[5M]
	b	Give any five examples of IoT devices and briefly describe their functions.	[L1][CO1]	[5M]
6		Discuss various types of IoT physical devices and endpoints with examples.	[L2][CO4]	[10M]
7	a	List any three tools used for IoT development and describe their basic purpose.	[L2][CO3]	[5M]
	b	How do development tools assist in managing IoT devices efficiently?	[L3][CO4]	[5M]
8		Explain the pcDuino board in detail and discuss its use as an IoT device.	[L4][CO2]	[10M]
9	a	List any three challenges in using IoT tools.	[L4][CO4]	[5M]
	b	What are the benefits of using IoT device management tools?	[L2][CO4]	[5M]
10		Elaborate on the benefits of using tools and platforms in IoT development.	[L4][CO4]	[10M]
11	a	Explain the role of pcDuino as an IoT device.	[L2][CO2]	[5M]
	b	Briefly explain how Beagle Bone Black is used in IoT applications.	[L2][CO2]	[5M]

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