USN : _____ Course Code : 18CS63

Sixth Semester B.E MAKEUP Examination, AUGUST_OCTOBER_2021

EMBEDDED SYSTEMS AND IOT

Time: 3 hrs Max. Marks :100

Instructions : Answer any FIVE full questions

	L	CO	PO	M
1a.Define Embedded Computing System. Explain the Characteristics of Embedded Computing Applications.	[2]	[1]	[1]	[6]
1b. Illustrate the significance of use of Microprocessors in digital design.	[2]	[1]	[1]	[6]
1c. Explain the embedded system design process with a case study.	[2]	[1]	[1]	[8]
2a. List and explain the challenges in Embedded computing System Design.	[2]	[1]	[1]	[6]
2b. Explain with a neat diagram the sample requirement form.	[2]	[1]	[1]	[6]
2c. Compare & Contrast Top down & bottom up design.	[3]	[1]	[1]	[8]
3a. List and explain the various data types of 8051 in 'C'.	[2]	[2]	[1]	[6]
3b. Develop an 8051 'C' program to send values of –4 to +4 to port P1.	[3]	[2]	[1,2]	[6]
3c. Develop an 8051 C program to get a byte of data form P1, wait ½ second, and then send it to P2.	[3]	[2]	[1,2]	[8]
4a. List out the various logical operators and bit wise operators of 8051 in 'C' and explain with one example for each.	[2]	[2]	[1,2]	[6]
4b. Develop an 8051 C program to get bit P1.0 and send it to P2.7 after inverting it.	[3]	[2]	[1,2]	[6]
4c. Develop an 8051 C program to convert ASCII digits of '4' and '7' to packed BCD and display them on P1 and P2.	[3]	[2]	[1,2]	[8]
5a. With a neat diagram explain TMOD register.	[2]	[2]	[2]	[6]
5b. Calculate the machine cycle frequency and time period for the XTAL frequency given below: a) 11.0592 MHz b) 22 MHz	[3]	[2]	[1,2]	[6]

5c. Develop an 8051 C program to toggle only bit P1.5 continuously every 50 ms. Use Timer 0, mode 1 (16-bit) to create the delay.

[3] [2] [2] [8]

6a. Explain with a neat block diagram the characteristics and working of Timer0 in Mode2.

[2] [2] [2] [6]

6b. Develop an 8051 C program to toggle only pin P1.5 continuously every 250 ms. Use Timer 0, mode 2 (8-bit auto-reload) to create the delay.

[3] [2] [2] [6]

6c. Develop an 8051 C program to transfer the message "YES" serially at 9600 baud, 8-bit data, 1 stop bit. Do this continuously.

[3] [2] [2] [8]

7a. Explain in detail a generic block diagram of an IoT Device..

[2] [4] [5] [6]

7b. Illustrate an example of IoT Service that uses Publish-Subscribe communication model.

[2] [4] [5] [6]

7c. Illustrate the Home Automation IoT application w.r.t.
a) Smart Lighting and
b)smart Appliances

[2] [4] [5] [8]

8a. With a neat diagram explain the functional blocks of IoT.

[2] [4] [5] [6]

8b. Briefly explain any two IoT levels.

[2] [4] [5] [6]

8c. Describe in brief any two IoT enabling Technologies.

[2] [4] [5] [8]

9a. With a neat block diagram, explain the basic building blocks of an IoT device.

[2] [4] [1, 3] [6]

9b. Explain the various Raspberry Pi interfaces.

[2] [4] [1, 3] [6]

9c. Develop a python code for blinking a LED with a Raspberry Pi.

[3] [4] [1, 3] [8]

10a. Explain the various features of Raspberry Pi board .

[2] [4] [1, 3] [6]

10b. Develop a program to illustrate the Interfacing of LED and switch with Raspberry Pi.

[3] [4] [1, 3] [6]

10c. Write a note on Linux on Raspberry Pi.

[2] [4] [1, 3] [6]

USN : _____

Course Code : 18IS53

Fifth Semester B.E FASTTRACK Examination, AUGUST_SEPTEMBER_2021

INTERNET OF THINGS

Time: 3 hrs

Max. Marks :100

Instructions :1. Answer any FIVE full Questions.

	L	CO	PO	M
1a. What is an embedded computer system? Outline complex systems and microprocessors.	[1]	[1]	[1]	[10]
1b. Explain BMW 850i brake and stability control system (ABS), with block diagram and working principle.				
2a. Explain Characteristics of Embedded Computing Applications.	[1]	[1]	[1]	[10]
2b. Interpret Challenges in Embedded Computing System Design	[2]	[1]	[1]	[10]
3a. Define Internet of Things. List Characteristics of Internet of Things.	[2]	[1]	[1]	[10]
3b. Explain generic block diagram of an IoT.	[1]	[2]	[1]	[10]
4a. Explain IoT protocols.	[2]	[2]	[1]	[10]
4b. Illustrate with block diagram, any two IoT levels / deployment templates.	[2]	[2]	[1]	[10]
5a. Explain IoT Key Features, List Advantages & Disadvantages of IoT systems.	[2]	[2]	[1]	[10]
5b. Outline Domain Specific IoTs: 1.Home Automation,2.Cities, 3.Environment, 4.Energy	[2]	[3]	[1]	[10]
6a. Summarize Domain Specific IoTs: 1.Logistics, 2.Agriculture, 3.Industry,4.Health and Lifestyle.	[2]	[3]	[1]	[10]
6b. Demonstrate with reference to Internet of Things: 1.Hardware and Software2.Sensors, 3.Smart Wearable Devices, 4.Standard Devices..	[2]	[3]	[1]	[10]
7a. Explain Architecture Reference Model.	[2]	[3]	[1]	[10]
7b. Explain the Protocols: 1.6LowPAN,2.RPL, 3.CoAP, 4.MQTT.	[2]	[4]	[1]	[10]
8a. Illustrate Device Discovery capabilities: Registering a device, De-register a device.	[2]	[4]	[1]	[10]
8b. Outline Intel IoTivity, XMPP Discovery extension.	[2]	[4]	[1]	[10]
9a. Explain Cloud Storage models and communication APIs.	[2]	[5]	[1]	[10]
9b. Explain Web server for IoT and Cloud for IoT.	[2]	[5]	[1]	[10]
10a. Explain Python web application framework and designing a RESTful web API.	[2]	[5]	[1]	[10]
10b. Explain Amazon Web services for IoT.				

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16CS/IS74

Seventh Semester B.E. Makeup Examination, January 2020
EMBEDDED SYSTEMS & INTERNET OF THINGS

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Answer one full question from each of the units*
2. *Assume any Missing Data*

UNIT - I

			L	CO	PO	M
1	a.	Define Embedded Computing System. Discuss the Characteristics of Embedded Computing Applications.	(1)	(1)	(1)	(10)
	b.	List the challenges in Embedded computing System Design & Discuss any two in detail.	(1)	(1)	(2)	(10)

OR

2	a.	Give an overview of embedded system design process with a case study.	(2)	(1)	(1)	(10)
	b.	Illustrate ARM assembly code to implement the following C assignments a. $z = a*(b + c) - d*e$ b. `if (i == 0) { i = i +10; }`	(3)	(1)	(2)	(10)

UNIT – II

			L	CO	PO	M
3	a.	Define IoT & explain its characteristics.	(2)	(2)	(2)	(10)
	b.	Discuss in detail a generic block diagram of an IoT Device	(3)	(2)	(1)	(10)

OR

4	a.	List the various IoT Protocols & explain any five in brief	(1,2)	(2)	(1)	(10)
	b.	With a neat diagram explain & analyze the various communication models.	(4)	(2)	(2)	(10)

UNIT - III

			L	CO	PO	M
5	a.	Identify IoT key features. List advantages and disadvantages of IoT.	(2)	(2)	(1)	(08)
	b.	Explain IoT Hardware and Software.	(2)	(2)	(1)	(06)
	c.	Explain IoT Technology , Protocols, and Common applications of IoT	(2)	(2)	(1)	(06)

OR

6	a.	Explain six Smart City concepts using IoT.	(2)	(2)	(1)	(08)
	b.	Explain three Environment concepts using IoT.	(2)	(2)	(1)	(06)
	c.	Explain three Energy concepts using IoT.	(2)	(2)	(1)	(06)

UNIT - IV

			L	CO	PO	M
7	a.	Explain in brief steps involved in IoT System design methodology with a neat diagram	(2)	(4)	(2)	(10)

Note: L (Level), CO (Course Outcome), PO (Programme Outcome), M (Marks)

b. What is an IoT Device; discuss the Basic building blocks of an IoT device. (3) (4) (5)

OR

8 a. Explain in brief Case Study on IoT System for Weather Monitoring (2) (4) (2)

b. Explain with a neat block diagram Home Automation web application (2) (4) (5)

L CO PO

UNIT -V

9 a. Discuss the key concepts of Web Application Messaging Protocol (WAMP) (2) (4) (2)

b. Explain with a neat block diagram, WAMP Session between client & router (2) (4) (5)

OR

10 a. Explain in detail the salient features of Xively Cloud for IoT (2) (4) (5)

b. Discuss the key features of Python Web Application Framework-Django (2) (4) (5)

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16CS/IS74

Seventh Semester B.E. Semester End Examination, Dec./Jan. 2019-20

EMBEDDED SYSTEMS AND INTERNET OF THINGS

Time: 3 Hours

Max. Marks: 100

Instructions:
1. *Answers must be brief and to the point.*
2. *Suitable data may be assumed, with better reasoning.*
3. *Draw diagrams, wherever necessary.*
4. *Write question number properly.*

UNIT - I

			L	CO	PO	M
1	a.	What is an embedded computing system? Describe the design of BMW 850i Brake and Stability Control System.	(1)	(1)	(1)	(06)
	b.	Summarize the characteristics of embedded computing applications and the Challenges involved in the design of such system	(2)	(1)	(1)	(06)
	c.	Explain the process of embedded system design with an example of a GPS Moving Map.	(2)	(1)	(1)	(08)

OR

2	a.	Solve x = (a + b) – c using C assignments using ARM instruction.	(3)	(1)	(2)	(06)
	b.	What is the necessity of power consumption embedded system design? List and review the power characteristics of C-MOS.	(2)	(1)	(1)	(06)
	c.	Demonstrate how the CPU performance can be enhanced using 1. Pipelined execution of ARM instructions. 2. Pipelined execution of multi-cycle ARM instructions.	(2)	(1)	(1)	(08)

UNIT – II

			L	CO	PO	M
3	a.	Explain IoT Link Layer Protocols, with its stack diagram.	(2)	(3)	(1)	(08)
	b.	Compare Microprocessor and Microcontroller.	(2)	(2)	(1)	(06)
	c.	Explain the ~~basics~~ fundamentals of Sensors and actuators.	(2)	(2)	(1)	(06)

OR

4	a.	Illustrate IoT Communication Models, with a neat block diagrams.	(1)	(4)	(1)	(10)
	b.	Contrast all 6 IoT Levels, with sketches and features.	(2)	(3)	(1)	(10)

UNIT - III

			L	CO	PO	M
5	a.	IoT Key Features,Advantages & Disadvantages	(2)	(3)	(2)	(10)
	b.	List & explain the following in brief a) IoT Hardware b) IoTSoftware	(1,2)	(3)	(2)	(10)

OR

6	a.	Explain Technologies & Protocols of IoT	(2)	(3)	(1)	(10)
	b.	Illustrate the Home Automation IoT application	(3)	(3)	(2)	(10)

				L	CO	PO	
			UNIT - IV				
7	a.	Explain the purpose and requirement specification in IoT design process considering Ho automation as an example.		(3)	(1)	(1)	(0
	b.	Explain the domain model specification in IoT design process considering considering Ho automation as an example.		(2)	(1)	(1)	(0
	c.	Describe IoT Design Methodology for information model specification		(2)	(1)	(1)	(0
			OR				
8	a.	Illustrate IoT Design Methodology with respect to Logistics applications		(3)	(1)	(1)	(0
	b.	Explain IoT Design Methodology with respect to Retail applications.		(2)	(1)	(1)	(0
	c.	What is an IoT Device? Explain Basic building blocks of an IoT Device, with neat diagram.		(2)	(2)	(3)	(0
			UNIT -V	L	CO	PO	
9	a.	What is Xively Cloud? Explain how data can be uploaded to Xively Cloud with a documen python code.		(2)	(3)	(2)	(1
	b.	Explain WAMP AutoBahn for IoT.		(2)	(3)	(2)	(1
			OR				
10	a.	What is Django Architecture? Explain briefly how you create a Django project.		(2)	(3)	(2)	(0
	b.	Illustrate Designing a RESTful Web API.		(2)	(3)	(2)	(0
	c.	Rewrite the python program for stopping an EC2 instance.		(2)	(3)	(2)	(0

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15CS/IS74

Seventh Semester B.E. Makeup Examination, January 2019
EMBEDDED SYSTEM DESIGN AND INTERNET OF THINGS

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Unit I and Unit IV are compulsory.*
3. *Data, if necessary, may be assumed.*
4. *Sketches, when required, may be drawn.*

UNIT - I

		L	CO	PO	M
1 a.	Explain the embedded system design process with the help of a block diagram.	(2)	(1)	(1)	(08)
b.	Construct and write the requirement chart for GPS moving map system.	(3)	(2)	(2)	(05)
c.	Develop the ALP to evaluate the following expression using ARM7 assembly programming $Z = (a << z) \mid (b \& 15)$	(3)	(2)	(2)	(07)

UNIT – II

		L	CO	PO	M
2 a.	Explain the features of four IoT protocols used in Link Layer laid by IEEE.	(2)	(1)	(1)	(06)
b.	Contrast all 4 IoT Communication Models.	(2)	(1)	(1)	(06)
c.	Illustrate IoT level-6 deployment template with block diagram.	(2)	(1)	(1)	(08)

OR

		L	CO	PO	M
3 a	Explain the Characteristics of an IoT System.	(2)	(1)	(1)	(06)
b	Explain REST – based communication APIs, with block diagram.	(2)	(1)	(1)	(06)
c	Illustrate IoT level-5 deployment template with block diagram.	(2)	(1)	(1)	(08)

UNIT - III

		L	CO	PO	M
4 a.	Define the terms sensors and actuators. Explain any one sensor and an actuator that you know.	(2)	(2)	(2)	(06)
b.	Explain the communication interfaces for data transfer available in Raspberry Pi.	(2)	(2)	(1)	(06)
c.	Build a Python program for Raspberry Pi to send an email on pressing of a switch.	(3)	(3)	(3)	(08)

OR

		L	CO	PO	M
5 a.	What is GPIO header? Explain the use of the same in Raspberry Pi.	(2)	(2)	(2)	(06)
b.	Develop a Python code on Raspberry Pi to demonstrate controlling of a LED with a switch.	(3)	(3)	(2)	(08)
c.	Explain briefly about any two single board computers other than Raspberry Pi that you know	(2)	(2)	(2)	(06)

UNIT - IV

		L	CO	PO	M
6 a.	Explain 6LowPAN Protocol.	(2)	(1)	(1)	(10)
b.	Explain IPv6 Routing Protocol for Low-Power and Lossy Networks (RPL)Protocol.	(2)	(1)	(1)	(10)

Outcome), PO (Programme Outcome), M (Marks)

UNIT - V

			L	CO
7	a.	What is WAMP? Explain the key concepts of WAMP.	(2) (4)	(
	b.	Explain the procedure to setup a MySQL database and configure it with Django project	(2) (4)	(
	c.	Explain the Django view that retrives data from Xively cloud with suitable example.	(2) (4)	(3

OR

8	a.	What is Django? Briefly explain its architecture.	(2) (4)	(3)
	b.	Explain the python code for sending data to Xively cloud with a suitable example.	(2) (4)	(3)
	c.	Explain about the Amazon Web Services for IoT.	(2) (4)	(3)

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15CS/IS74

Seventh Semester B.E. Semester End Examination, Dec/Jan 2018-19

EMBEDDED SYSTEMS AND INTERNET OF THINGS

Time: 3 Hours

Max. Marks: 100

Instructions: 1. *Unit- I and Unit – IV are compulsory.*
2. *Attempt any one question from remaining units.*

UNIT - I

		L	CO	PO	M
a.	Explain Challenges in embedded computing system design.	(2)	(1)	(1)	(06)
b.	Explain Characteristics of embedded computing applications	(2)	(1)	(1)	(06)
c.	Define an embedded computer system? Explain example for BMW 850i Brake and Stability Control System.	(3)	(2)	(2)	(08)

UNIT – II

		L	CO	PO	M
a.	Define IoT. Explain the important characteristics of IoT.	(2)	(1)	(1)	(04)
b.	Explain the four IoT communication models.	(2)	(1)	(1)	(08)
c.	Illustrate any two levels of IoT systems with suitable example applications.	(2)	(1)	(1)	(08)

OR

3 a.	Illustrate the generic block diagram of an IoT device.	(2)	(1)	(1)	(06)
b.	Explain the two IoT communication APIs	(2)	(1)	(1)	(07)
c.	Summarize the important features of any two enabling technologies of IoT	(2)	(1)	(1)	(07)

UNIT - III

		L	CO	PO	M
4 a.	Define an IoT device? Explain Block diagram of an IOT Device.	(2)	(3)	(1)	(06)
b.	Develop python programs for: i. switching LED on / off from Raspberry Pi Console. ii. for switching LED / Light based on LDR reading.	(3)	(3)	(2)	(06)
c.	Explain Raspberry Piboard with various components, peripherals & status LEDs.	(2)	(4)	(3)	(08)

OR

5 a.	ExplainRaspberry Pi frequently used commands.	(2)	(2)	(3)	(08)
b.	Explain Raspberry Pi interfaces.	(2)	(2)	(3)	(04)
c.	Develop python programs for: i. for blinking LED. ii. controlling an LED with a switch.	(3)	(3)	(2)	(08)

			L	CO	PO
		UNIT - IV			
6	a.	Explain the IoT architectural reference model with suitable block diagram	(2)	(2)	(1)
	b.	What is 6LoWPAN? List its features	(1)	(2)	(3)
	c.	Explain the MQTT protocol for IoT.	(2)	(3)	(2)
			L	CO	PO
		UNIT -V			
7	a.	Explain key concepts of Web Application Messaging Protocol (WAMP), with a session betw Client and Router.	(2)	(1)	(1)
	b.	i. Explain Publish-subscribe messaging using WAMP-AutoBahn, ii. WAMP protocol commands for installing AutoBahn.	(2)	(1)	(1)
			L	CO	PO
		OR			
8	a.	Explain designing a RESTful Web API, with necessary python code for Django model & Dja views for Weather Station.	(2)	(1)	(1)
	b.	What is the use of Amazon S3? Develop a python code for uploading a file to an S3 cloud storag	(2)	(1)	(1)