Q.P. Code: 19EC4110 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

M.Tech I Year II Semester Regular Examinations October-2020

ADVANCED MICROCONTROLLERS

(Embedded Systems**)**

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	**a**	Define embedded system.	**2M**
	b	Explain the different classifications of embedded systems. Give an example for each.	**10M**

OR

2	**a**	With a neat sketch, explain the process involved in embedded system design and development life cycle.	**9M**
	b	Explain the importance of RTOS in an embedded system	**3M**

UNIT-II

3	**a**	Describe the pipeline executing characteristics in an ARM processor with necessary diagrams and examples.	**6M**
	b	Explain about exceptions, interrupts and the vector table in an ARM processor.	**6M**

OR

4		Explain the following Thumb instructions with an example i) Stack ii) Software interrupt iii) Single register load-store iv) Multiple register load-store	**12M**

UNIT-III

5	**a**	Demonstrate by writing a C program to check for errors in a data packet during the transmission of 64-bit data using TCP/IP protocol.	**6M**
	b	Describe how to use C data types efficiently for ARM processor programming	**6M**

OR

6	**a**	What is Pointer aliasing in C language? Explain the same with an example.	**9M**
	b	Mention the points to be considered to avoid pointer aliasing	**3M**

UNIT-IV

7		Explain the following registers of MSP430 μC:	
		(i) Program Counter	**3M**
		(ii) Stack Pointer	**4M**
		(iii) Status Register	**5M**

OR

8	**a**	Mention the need of pull-up/pull-down resistor in any processor or controller.	**2M**
	b	With a neat sketch explain the operation of timers in MSP430 μC.	**10M**

UNIT-V

9	**a**	Explain the operation of Inter-integrated Circuit Bus in detail.	**6M**
	b	With a neat sketch describe how the serial peripheral interface can be implemented in the Universal Serial Communication Interface of MSP430 μC.	**6M**

OR

10	**a**	Write an Embedded C program to blink onboard RED LED (connected to P4.6) with a delay of 1secusing MSP430FR5969 development platform.	**5M**
	b	By writing an Embedded C program, demonstrate how the interrupts are serviced in MSP430 based microcontrollers.	**7M**

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