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M.E. First Semester (Digital Electronics) (Part Time / Full Time) (C.G.S.- New)

13207 : Embedded System Design : 1 UMEF 5

P. Pages : 2 | **AW - 3761**

Time : Three Hours | Max. Marks : 80

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Assume suitable data wherever necessary.
3. Illustrate your answer necessary with the help of neat sketches.
4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. Describe major features of ARM processors with the help of block diagram. **13**

OR

2. a) Describe the control logic for simple memory interface of ARM7 processor with SRAM & ROM of suitable capacity. **8**

b) Compare the features of each of following type of processor used in Embedded systems. **5**
i) micro processor ii) micro controller
iii) RISC processor iv) DSP and
v) ASSP

3. a) Explain how we can change from native ARM mode to Thumb mode and vice-versa. **8**

b) Explain how interrupt service routines can be written in 'C' for arm processors. **6**

OR

4. a) Explain the importance of "volatile" keyword in embedded system programming with help of example. **5**

b) What is use of preprocessor in embedded software. Explain various categories of preprocessor directives. **9**

5. Draw the interfacing circuit of 16×2 LCD with LPC 2148 micro controller in 4-bit data mode. Assume that DB7 to DB4 of LCD are connected to LPC port bits P0.20 to P0.17 and RS, RW and EN pins of LCD are connected to P0.23, P0.22 and P0.21 respectively. Write program to display "ME DIG ELECTRO" on first line of LCD and 'EMB SYSTEM" on second line of LCD. **13**

OR

6. Draw interfacing ckt of analog input applied to P0.28 pin (AD 0.1 pin) of LPC 2148 microcontroller. Assume that LCD is also interfaced to LPC 2148 µC kit in manner mentioned in Question 5 (Above) write a C program to display the given analog voltage in range of 0 to 5V on the 2nd line of LCD display. **13**

7. a) Enumerate some of the services offered by RTOS. **7**

b) What are the problems that may arise while using semaphores? **6**

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OR

8.	a)	What are strategies used by RTOS on interrupt source calls?	**7**
	b)	Explain the following terms with reference to RTOS i) Message Queue. ii) Mailbox iii) Pipe iv) Socket	**6**
9.	a)	Explain Round Robin Model for task assignment and scheduling in RTOS with neat diagram.	**7**
	b)	How is critical section handled by preemptive scheduler.	**6**

OR

10.	a)	Explain Earliest Deadline first algorithm in detail.	**7**
	b)	Describe major features of micro COS-II RTOS.	**6**
11.	a)	Explain any one technique of implementing embedded system of moderate complexity.	**7**
	b)	Explain the process of validating embedded system product.	**7**

OR

12.	a)	Explain the concept of hardware – software co-design.	**7**
	b)	Explain the steps involved in estimation modelling of embedded system.	**7**

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