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06CS74

**Seventh Semester B.E. Degree Examination, Dec.09-Jan.10**  
**Embedded Computing Systems**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting atleast TWO questions from each Part.**

**PART - A**

- 1 a. Compare the definitions of embedded system from the following authors i) Wayne Wolf  
ii) Todd.D. Mortan. (04 Marks)  
b. What are the major differences between Harvard and Von Neuman architecture? Give an example. (06 Marks)  
c. What are the functional circuits in a microcontroller chip? Explain them in detail. (10 Marks)
- 2 a. What is charge pump? Explain the following terms related to embedded hardware units :  
i) Clock oscillator circuit ii) System timer iii) Power – up reset and watch – dog timer. (10 Marks)  
b. Comprehend the procedure to code high level and assembly software into m/c implementable software, for an embedded system. Highlight their differences. (10 Marks)
- 3 a. Compare the parallel ports interfaces for the keypad, stepper motor and touch screen. (10 Marks)  
b. Describe and compare UART and HDLC protocol. (10 Marks)
- 4 a. Show the procedure of diversion to higher priority interrupts. (06 Marks)  
b. What is DMAC? Explain the steps of DMA to facilitate a multi byte data transfer. (06 Marks)  
c. What is virtual device driver? Explain any two of them in detail. (08 Marks)

**PART - B**

- 5 a. What are the Task and ISR? Distinguish among the ISRs, Tasks and functions. (10 Marks)  
b. What is a semaphore? What are the IPC functions used by a software programmer? Explain them. (10 Marks)
- 6 a. What is the function of Kernal in RTOS? Comprehend the different memory management strategy for a system. (10 Marks)  
b. What is RTOS? List and explain the different services of RTOS. (10 Marks)
- 7 a. What are the design principles of RTOS to design an embedded system? Explain them. (10 Marks)  
b. What is the significance of spin lock? Narrate the petrinet based model for critical section service, by a preemptive scheduler. (10 Marks)
- 8 a. What is industry standard file format for storing the locator file? Show the memory needed in case of Princeton and Harvard architecture in the system. (10 Marks)  
b. What is a simulator? Illustrate the detailed design development process using a simulator. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.