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**Seventh Semester B.E. Degree Examination, June/July 2014**  
**Embedded Computing Systems**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting  
atleast TWO question from each part.**

**PART – A**

- 1 a. What are the challenges faced in designing an embedded system. (06 Marks)
- b. Compare the definitions of embedded system from the following authors :  
i) Wayne wolf ii) Todd D. Morton. (04 Marks)
- c. Define design metrics in an embedded system. What are the different competing design metrics? What are the design process in an embedded system? (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. Describe : i) UART ii) RS232C iii) SDIO. (10 Marks)
- 3 a. Compare the parallel ports interfaces for the keypad, stepper motor and touch screen. (08 Marks)
- b. Explain the use of each control bit in I<sup>2</sup>C bus protocol. (05 Marks)
- c. Mention various wireless and mobile system protocols. Explain any two of them. (07 Marks)
- 4 a. What is virtual device driver? Explain any two of them, in detail. (08 Marks)
- b. Explain context switching, interrupt latency and interrupt service deadline. (08 Marks)
- c. How do the device driver functions and ISR functions differ? Explain. (04 Marks)

**PART – B**

- 5 a. Differentiate between function, task and ISR. (06 Marks)
- b. What are the different programming models? With an example, explain the FSM model. (08 Marks)
- c. What are the parameters of a task control block (TCB) of a task? Why should each task have a distinct TCB? (06 Marks)
- 6 a. What is RTOS? List and explain the different services of RTOS. (10 Marks)
- b. What is the function of kernel in RTOS? Comprehend the different memory management strategy for a system. (10 Marks)
- 7 a. Describe earliest deadline first (EDF) and rate monotonic schedule (RMS) scheduling models. (10 Marks)
- b. What are the design principles of RTOS to design an embedded system? Explain them. (10 Marks)
- 8 a. Explain : i) Simulators ii) ICE. (10 Marks)
- b. What is the 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)

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