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10CS72

Seventh Semester B.E. Degree Examination, June/July 2016
Embedded Computing Systems

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. What is Embedded system? Give one example. (02 Marks)
- b. Explain briefly the characteristics of Embedded computing application. (10 Marks)
- c. Write the top-down view of the embedded system design process and write a requirement chart of model train controller. (08 Marks)

- 2 a. Write ARM assembly code to implement the following C assignment. (04 Marks)
 $z = a(b + c) - d * e$
- b. What is an interrupt priorities mechanism used to handle multiple device interrupts? (08 Marks)
- c. What is cache? How it relates to memory system mechanism? Explain different types of cache miss. (08 Marks)

- 3 a. Explain a bus with a DMA controller mechanism? (08 Marks)
- b. Differentiate between Random accesses memories and Read only memories. (04 Marks)
- c. List out the I/O devices commonly used in embedded computing systems. Explain briefly any three I/O devices. (08 Marks)

- 4 a. For a give basic block, rewrite it in single assignment form and then draw the dataflow graph. (06 Marks)
 $w = a + b$
 $x = a - c$
 $y = x + d$
 $x = a + c$
 $f = y + e$
- b. Explain any two program optimization Techniques. (08 Marks)
- c. Write a short note on alarm clocks. (06 Marks)

PART – B

- 5 a. Explain the basic function of Real time kernel. (10 Marks)
- b. Give different between monolithic kernel and micro kernel. (04 Marks)
- c. Define process. With a diagram, explain state transition of a process. (06 Marks)

- 6 a. What is Interprocess Communication (IPC)? Give an overview of different types of IPC mechanisms adopted by various operating systems. (10 Marks)
- b. What is deadlock? What are the different conditions favoring deadlock? (05 Marks)
- c. Explain the different functional requirement that needs to be evaluated in the selection of an RTOS. (05 Marks)

Important Note : 1. On completing your answers, cursorily 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.

- 7 a. Explain the structure and characteristics of an I²C bus. (10 Marks)
b. Explain Ethernet packet format. (05 Marks)
c. Explain the following terms :
Internet security, Internet service stack (05 Marks)
- 8 a. Explain the following interated development Environment
Simulators
Emulators
Debugger (12 Marks)
b. Explain the different tools used for hardware debugging. (08 Marks)

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