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.
      $z = a (b + c) - d * e$ **(04 Marks)**
   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.
      $w = a + b$
      $x = a - c$
      $y = x + d$
      $x = a + c$
      $f = y + e$ **(06 Marks)**
   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)**

7 a. Explain the structure and characteristics of an I^2C 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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