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10EC74

**Seventh Semester B.E. Degree Examination, Dec.2017/Jan.2018**

**Embedded System Design**

Time: 3 hrs.

Max. Marks: 100

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

**PART - A**

- 1 a. Define an embedded system. Explain the traditional approach of an embedded system design with neat flow diagram. (08 Marks)
- b. What are the different computing engines available in the embedded system? Explain briefly. (06 Marks)
- c. A microprocessor support 144 instruction and has 256 register. Write the instruction format using 32-bit instruction register for 1-adder, 2-adder and 3-adder using big Endian and little Endian. (06 Marks)
- 2 a. Explain the various types of addressing modes used in embedded system design with example. (06 Marks)
- b. What are the basic operation can be performed on a register and also explain RTN model for microprocessor data path and memory interface. (08 Marks)
- c. What is state diagram? Briefly explain FSM (Finite State Machine) with a block diagram. (06 Marks)
- 3 a. Discuss the classification of memory. (06 Marks)
- b. Explain the various schemes available in DMA. (06 Marks)
- c. What do you mean 'cache hit' and 'cache miss' and also illustrate cache direct mapping methods. (08 Marks)
- 4 a. Explain waterfall life cycle model along with steps. (08 Marks)
- b. Briefly explain the various kinds of cohesion. (06 Marks)
- c. Discuss functional versus architecture model. (06 Marks)

**PART - B**

- 5 a. What is operating system? Explain the roles and responsibilities of each component. (08 Marks)
- b. Explain about (i) process and threads, (ii) sharing resources. (06 Marks)
- c. What are the various kinds of stack used in embedded application? Briefly explain. (06 Marks)
- 6 a. What is TCB? Also illustrate TCB and its C-code structure. (08 Marks)
- b. Explain about FOREGROUND and BACKGROUND systems. (05 Marks)
- c. Describe memory management revisited. (07 Marks)
- 7 a. What do you mean by 'performance' or 'efficiency measure' in an embedded system? (06 Marks)
- b. Analyze and explain the following program using looping constructs flow:  
 Program code: `int sum = 0;`  
                   `for (int i = 0; i < N; i++)`  
                   `sum = sum + i;` (08 Marks)
- c. Briefly explain the basic fundamental operations in DATA STRUCTURE. (06 Marks)
- 8 a. What are hardware accelerators? Explain the use of hardware accelerator with example. (06 Marks)
- b. Explain the basic elements used in analyzing flow of control. (08 Marks)
- c. How do you reduce power consumption in software? (06 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.