



10EC74

**Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020**  
**Embedded System Design**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. With block diagram, explain the various components in a microprocessor based Embedded System. (08 Marks)  
b. With diagram, explain Embedded System life cycle. (08 Marks)  
c. Explain a scheme to interface Embedded system to external world using I/O portion of Von Neumann machine. (04 Marks)
- 2 a. Give the high level block diagram for a FSM and explain the concept. (05 Marks)  
b. With diagram, explain the DSP architecture used in Embedded System. (05 Marks)  
c. Explain different types of Execution flow of instruction in an Embedded System. (05 Marks)  
d. Give the timing diagram for register operations. (05 Marks)
- 3 a. Give the design for a  $4k \times 16$  SRAM. (08 Marks)  
b. With block diagram, explain basic concepts of caching. (08 Marks)  
c. With diagram, explain Refresh Timing and Refresh address in DRAM. (04 Marks)
- 4 a. With diagram, explain the water fall model and V cycle model. (10 Marks)  
b. Explain Architectural design with the help of an example. (10 Marks)

**PART – B**

- 5 a. Explain the functions of an RTOS. (10 Marks)  
b. Explain the memory management scheme of an RTOS. (06 Marks)  
c. What is thread? Explain single process multiple threads. (04 Marks)
- 6 a. Explain Runtime stack, Application stack and Multiprocessing stacks. (06 Marks)  
b. Give the details of Task control block and explain. (04 Marks)  
c. Explain operating system virtual machine model and High level OS Architecture with the help of diagrams. (10 Marks)
- 7 a. With the help of memory map, explain memory loading. Also give the design of memory map. (08 Marks)  
b. Give methods to reduce response time and time loading. (08 Marks)  
c. Explain Hardware accelerators. (04 Marks)
- 8 a. Analyse the following basic flow control constructs:  
(i) Constant time statements (ii) Looping constructs (iii) Conditional statements. (08 Marks)  
b. Explain the efficiency measures of an Embedded System. (08 Marks)  
c. Explain SMART cache. (04 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.

