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10CS72

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

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. Mention its characteristics. (04 Marks)  
b. With a neat flow diagram, explain embedded system design process. (06 Marks)  
c. Write the requirement chart of MTC and explain the sequence diagram for transmitting a control input in a model train controller. (10 Marks)
- 2 a. Differentiate between Von Neumann and Harvard architectures. (04 Marks)  
b. What is the average memory access time of a machine whose hit rate is 93%, with a cache access time of 5ns and a main memory access time of 80ns? (04 Marks)  
c. Explain the following terms :  
i) Traps ii) Exceptions iii) Supervisor mode. (06 Marks)  
d. Explain the format of ARM data processing instruction. (06 Marks)
- 3 a. Explain :  
i) Watch dog timer ii) Requirement chart of Alarm clock. (08 Marks)  
b. Explain the hardware architecture of a typical PC. (06 Marks)  
c. With a neat diagram, explain bus with a DMA controller. (06 Marks)
- 4 a. Explain any two program optimization techniques with example. (08 Marks)  
b. With a neat flow diagram, explain the process of program generation from compilation through loading. (06 Marks)  
c. Sketch and explain the data flow graph model. (06 Marks)

**PART – B**

- 5 a. What is RTOS? List the different services of RTOS. (05 Marks)  
b. What is TCB? Explain its structure. (05 Marks)  
c. What are the factors to be considered for selection of scheduling algorithm. (04 Marks)  
d. Explain : i) Task ii) Process iii) Thread. (06 Marks)
- 6 a. Explain the two different types of inter-process communication mechanisms. (10 Marks)  
b. Explain the following :  
i) Advanced configuration and power interface  
ii) L-shaped usage distribution. (19 Marks)
- 7 a. Explain distributed embedded system? Mention its advantages. (05 Marks)  
b. Explain the CAN data frame format. (05 Marks)  
c. Describe the structures of : i) I<sup>2</sup>C Bus ii) IP packet. (10 Marks)
- 8 a. Explain the different types of files generated on cross compilation (08 Marks)  
b. Explain the advantages and limitations of simulator based debugging. (06 Marks)  
c. Write short notes on target system and host system. (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.