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10CS72

**Seventh Semester B.E. Degree Examination, July/August 2021**  
**Embedded Computing System**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions.**

- 1 a. What is an Embedded System? Explain Embedded System design process. (10 Marks)  
b. With neat diagram, explain sequence diagram for transmitting a control input of a model train controller. (10 Marks)
- 2 a. Bring out the differences between A Von Neuman architecture and A Harvard architecture. (05 Marks)  
b. Convert the following 'C' assignments into ARM instruction:  
i)  $x = (a + b) - c$  ;  
ii)  $y = a * (b + c)$  ; (05 Marks)  
c. With neat diagram, explain direct-mapped cache and set associative cache. (10 Marks)
- 3 a. Explain the basic building block of bus protocol with neat diagram and explain the bust read transaction with a timing diagram. (10 Marks)  
b. With neat diagram, explain architecture of a logic analyzer. (10 Marks)
- 4 a. Explain the components for embedded programs with examples. (10 Marks)  
b. With example explain loop optimization techniques. (10 Marks)
- 5 a. What is RTOS? List and explain basic functions of the Real Time Kernel (RTOS). (10 Marks)  
b. Define process. Explain the structure, states, state transition of a process. (10 Marks)
- 6 a. What is interprocess communication mechanism? Explain two major styles of interprocess communication. (10 Marks)  
b. Explain the functional and nonfunctional requirements, that needs to be analyzed in the selection of RTOS for an embedded design. (10 Marks)
- 7 a. Explain Ethernet CSMA/CD algorithm and packet format. (10 Marks)  
b. Explain the following:  
i) I<sup>2</sup>C structure  
ii) CAN Architecture (10 Marks)
- 8 Write a short note on:  
a. Simulators and Emulators  
b. Multiprocessing and Multitasking  
c. Watchdog Timer  
d. Supervisor mode and Exception. (20 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.