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^2C 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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