M.Tech. Degree Examination, December 2010
Embedded Systems Design

Time: 3 hrs.

Max. Marks:100

Note: *1. Answer any FIVE full questions.*
2. Standard notations are used.

1 a. What are the different processor cores used in the design of embedded systems? What are the considerations in choice of the processor core? **(10 Marks)**

   b. What are the different hardware units in a processor based embedded system? Outline their functional utility in system design. **(10 Marks)**

2 a. What are the different modes of serial communication between input/output devices and processor in an embedded system? **(10 Marks)**

   b. Explain how 8255 can be used for parallel communication in embedded systems. What are the features of parallel port devices? **(10 Marks)**

3 a. What are the different structural units in a processor? Differentiate between the CISC and RISC processor types and discuss their application. **(10 Marks)**

   b. What are the different types of memory devices used in embedded systems? Outline their utility in system design. **(10 Marks)**

4 a. What are the different sources of interrupts n embedded systems? What are the features of interrupt service mechanisms? **(10 Marks)**

   b. What are the applications of 1^2C and CAN bus for communication between multiple input/output devices? **(10 Marks)**

5 a. Write an assembly level program to turn on and turn off an LED connected to bit–2 of port–A in 16F84 PIC/(or)68HC11 micro–controller. Choose the on–time T_{ON} and the off–time T_{OFF} suitably. **(10 Marks)**

   b. Explain the architecture of 16F84/ (or) 68HC11. What are the addressing modes it supports? **(10 Marks)**

6 a. What are the performance features of ADC circuits? Explain the features of ADC systems provided by PIC or Motorolla micro-controllers. **(10 Marks)**

   b. Explain the features of asynchronous communication provided by PIC or Motorolla micro-controllers. **(10 Marks)**

7 a. What are the petri – nets? Illustrate how petri-nets can be used to model event controlled real time program functions. **(10 Marks)**

   b. What are the issues in modeling multi-processor systems? Explain the use of synchronous data flow graph models for multi-processor systems. **(10 Marks)**

8 a. Explain the shared data problem. What are the methods used to overcome the problem? **(10 Marks)**

   b. Explain how message queues and mailboxes can be used for inter–process communication. **(10 Marks)**

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