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NEW SCHEME

Eighth Semester B.E. Degree Examination, May 2007
Electrical and Electronics Engineering
Embedded Systems

Time: 3 hrs.]

[Max. Marks:100

Note : Answer any FIVE full questions.

- 1 a. What is an embedded system? On what basis embedded systems are classified? Give examples. List the skills required to design such systems. (10 Marks)
- b. Discuss the features of a typical 68 Hell microcomputer , with the help of a block schematic. Also give the register architecture. (10 Marks)
- 2 a. List the advantages of C language over assembly language. (04 Marks)
- b. What are macros? Give an example. When do embedded C programmers prefer macros? (06 Marks)
- c. With the help of pseudocode, explain Round Robin with interrupts software architecture. Cite examples that uses this architecture and list the complexities of the architecture. (10 Marks)
- 3 a. What is a task? Discuss its states. Discuss task scheduling of 3 tasks with one task locking a peripheral of the system for some time and other task needing its service. (10 Marks)
- b. List i) Rules to check C functions are reentrant or not ii) Methods to convert non-reentrant to reentrant functions. Give an example of non-reentrant function and change it to reentrant by any method. (10 Marks)
- 4 a. Write the two encoding scheme equations of n-bit DAC, that converts digital data to analog. Tabulate for a 4-bit DAC, analog output in both schemes, if maximum expected output voltage is 5 V. (10 Marks)
- b. Under what conditions, a DAC is said to be in
 i) Two-quadrant operation ii) Four-quadrant operation.
 Illustrate each of the operation. (10 Marks)
- 5 a. Explain successive approximation type ADC. (06 Marks)
- b. Discuss the need for sample and hold circuit and explain its operation. (06 Marks)
- c. With reference to data acquisition system, define i) accuracy ii) resolution iii) precision iv) repeatability. (08 Marks)
- 6 a. What is switch ringing? Discuss how a capacitor eliminates bounce of a switch when
 i) Pressed ii) released. Find the value of capacitance of such a setup, if bounce time is 5 ms, pull-up of 1 k and capacitor can charge upto 0.7 V. (14 Marks)
- b. Discuss
 i) Why open collector logic is preferred in IO interfacing.
 ii) Use of individual resistors for each segment of a 7-segment LED instead of a single resistor on the common side. (06 Marks)
- 7 a. Discuss
 i) Need for ROM in embedded systems.
 ii) Characteristics of ROM and its variants. (10 Marks)
- b. With reference to serial IO, define
 i) frame ii) full duplex iii) half duplex iv) simplex.
 Cite an embedded system that uses above methods of communication. (10 Marks)
- 8 Discuss, briefly,
 a. Common design metrics. b. Semaphores and its problems.
 c. System on chip. d. Features of 8051. (20 Marks)