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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

IT

Fourth Semester

IT9252 / IT482 Embedded Systems

(Regulation 2008)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. List four characteristics of embedded systems.
2. Distinguish Microprocessor and Microcontroller.
3. Write a delay routine in ALP for 1 millisecond using timer 0 of 8051 in mode 1. Use 12 MHz crystal frequency.
4. How do you demultiplex low order address and data lines of 8051?
5. Name the two types of real time scheduling techniques. Give an example to each type.
6. Define reentrant program.
7. Write an Embedded C program for 8051 to copy the elements stored in external memory from 8000H to 801FH to internal RAM.
8. How do you access SFRs of 8051 using Embedded C? Give an example.
9. Name three real time constraints in embedded system design.
10. List four methodologies of embedded systems design.

Part – B (5 x 16 = 80 marks)

11. (i) Explain processor modes of ARM processor in detail. (6)
(ii) Classify the 8051 instructions based on the operations and explain each type with examples. (10)
12. a) (i) Write an 8051 assembly language program using interrupt to open the emergency exit by sending a control signal through a port pin when a switch connected to INT0 is pressed. (8)
(ii) Explain the operation of timer/counter available in 8051. (8)

(OR)

- b) (i) Distinguish asynchronous serial communication and synchronous serial communication. Explain the functioning of serial communication port available in 8051. (10)
(ii) Write an assembly language program to serially transmit the message "WELCOME". (6)

13. a) Distinguish Rate monotonic and EDF scheduling algorithms. Explain them with examples. (16)
- (OR)**
- b) (i) List the Inter Process Communication styles. Describe each type in detail. (12)
- (ii) What is pre-emptive multitasking? Give an example. (4)
14. a) (i) Discuss the portability issues in Embedded C (4)
- (ii) Write an Embedded C program to toggle the alternate LEDs connected to port 2 of 8051 for every 1 second. Generate the delay using hardware. Assume 12 Mhz crystal frequency. (12)
- (OR)**
- b) (i) Design an embedded system using 8051 and write code using Embedded C for the following modules:
Module 1: To count the people coming through the front door and display hall full message using LCD display when 100 people entered.
Module 2: To continuously monitor power availability and switch ON Genset if power goes off. (12)
- (ii) List the advantages of using Embedded C over assembly language. (4)
15. a) (i) Name the three types of multi state systems. Give one example embedded system for each type and explain. (8)
- (ii) Describe the role of embedded software development tools debugger and emulator (8)
- (OR)**
- b) Design an intruder detection system in a museum using 8051 and RTOS. (16)