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B.E / B.Tech. DEGREE END SEMESTER EXAMINATIONS, MAY/JUN 2013
INFORMATION TECHNOLOGY BRANCH
IV SEMESTER (REGULATIONS 2009)
IT 9252 – EMBEDDED SYSTEMS

Time: 3 hrs

Max. Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. Compare and contrast microprocessor and micro controller
2. Discuss the difference between SJMP and LCALL instructions with an example
3. Draw memory interface diagram for generating a 32k x 16 memory with memory blocks of 16k x 16
4. Write register structure of TMOD register in 8051 and discuss about different timer modes
5. Explain briefly priority inversion in scheduling
6. Explain about context switching with example
7. Write an embedded C program to send values -10 to 10 to port P1
8. Write an embedded C program to check the status of the switch connected to 2rd pin of Port 1, If it is ON ring a buzzer which is connected at pin 2.5
9. Explain briefly debugger and emulator
10. Explain mutistate systems (timed) with an example

Part – B (5 x 16 = 80 Marks)

11. (i) Write an embedded C program to send message “Embedded sys” at port 1 (6)
(ii) Write an embedded C program using interrupts to do the following
Create a square wave of 5 KHz frequency and
Receive a data given at port 1 and send it serially with a baud rate of 9600
(assume that XTAL =11.0592 MHz) (10)
 - 12a. (i) Draw architecture diagram of 8051 micro controller and explain the working principle of this processor (10)
(ii) Write an Assembly program to find the MSB and LSB bit of an accumulator
If MSB = LSB send ‘Y’ at Pin P0, if not send ‘N’ at P0 (6)
- (OR)
- 12.b. (i) Draw dataflow model of ARM core and explain the working principle of this processor (10)
(ii) Explain briefly BL, LSL and MLA instructions of ARM core with example (6)

a. Connect a 16K x 8 data and 1K x 8 program memory with 8051. Draw the connection diagram with an example code to read data and program segments from the Data memory and program memory and display them at port 1

(OR)

b. Write steps to program 8051 in timer mode 2 and write an assembly code to generate a rectangular wave of 3ms on time and 6ms off time with 11.0592 MHz oscillator.

14.a. Differentiate dynamic and static priority based scheduling

Discuss about EDF Scheduling and schedule the following task with EDF

(process(exe time, deadline)) -- P1(1,4) P2(2,5) P3(1,20)

(OR)

b. Discuss in detail about inter process communication mechanisms in embedded systems

Schedule the following task set with fixed priority algorithm. Assume top priority process is

P1 and least priority process is P3

(process(exe time, deadline)) -- P1(1,4) P2(2,5) P3(1,20)

15.a Discuss in detail about design issues in embedded system design

and Discuss about any three design methodologies in detail

(OR)

b. Design a controller for a traffic signal, identify the functions to implement the system and write the code for the same