

Roll No:

B.E. (Full-time) End Semester DEGREE EXAMINATIONS, April / May 2011

ELECTRICAL & ELECTRONICS ENGINEERING,

Fourth Semester – (Regulation 2008)

EE 9252 MICROPROCESSORS AND MICRO CONTROLLERS

Time : 3 hr

Answer ALL questions

Max. marks : 100.

PART – A (10 x 2 = 20)

1. What are the similarities between 'CALL, RET' pair and 'PUSH, POP' pair? What are the differences?
2. State any four differences between memory mapped I/O and peripheral mapped I/O.
3. What is the vector address corresponding to Timer0 interrupt of μC 8051 and that corresponding to RST5.5 of μP 8085?
4. Correct the mistake in the following delay subroutine of μP 8085. Also evaluate approximately the count required to obtain a time delay of 7 msec. Assume a μP clock frequency of 3 MHz.
 Delay : LXI B, 16-bit count
 Repeat : DCX B
 JNZ Repeat
 RET
5. How would you check if there was any framing error in the character recently received by the USART 8251?
6. How would you initialize 8259 to have ISR address for IR0 as 4560H, ISR address for IR1 as 4564H, etc.
7. Distinguish between the operations of LXI H,4500H and LHLD 4500H? Also identify the addressing mode used in each of these instructions.
8. There is no explicit instruction for performing 'Jump if the overflow flag is set' in μC 8051. How would you achieve this?
9. What is/are the instruction(s) available in μC 8051 to make reference to a look-up table included as a part of the program code?
10. How is the IC 74373 (8-bit D-latch) useful in a μP / μC based system design?

PART – B (5 x 16 = 80)

11. Along with a neat sketch of the functional block diagram / architecture, describe the salient features available in the 16-bit μP 8086. Discuss the role of both BIU and EU.
12. a) i) Draw the timing diagram showing fetching and complete execution of the μP 8085 instruction STA 4567H. Assume that this instruction is fetched from memory location 4321H.
 ii) Along with a neat sketch of the functional block diagram / architecture, describe the salient features available in the 8-bit μP 8085. (8 + 8)

OR

OR

- b) i) Given two unsigned 8-bit numbers at memory locations 4200H and 4201H, write a program which finds the sum, difference (2nd number *minus* 1st number, assumed positive), product (assumed lesser than 0FFH), quotient and remainder on performing (2nd number / 1st number) and stores them at subsequent memory locations. Use μ P 8085 or μ C 8051 assembly language.
ii) Using μ P 8085 assembly language, write a time delay subroutine, which generates a delay of 1 msec. Use counter-0 of 8253 timer in 'reading on fly / latch on count' mode. Assume its input clock frequency to be 1 MHz.
iii) Using μ C 8051 assembly language, write a time delay subroutine, which generates a delay of 1 msec. Use one of its internal timers in any suitable mode. Assume the crystal frequency to be 12 MHz. (6+5+5)

13. a) Along with relevant external hardware, internal block diagram and relevant control word formats, explain how keypad and displays have been interfaced to μ P 8085 using 8279 in the μ P kits. Also write a program segment which would display ' EE 9252 ' in the μ P kit that you have used in the laboratory.

OR

- b) Along with internal block diagram and relevant mode/ command/ status word formats, describe the salient features of 8251 – Universal Synchronous Asynchronous Receiver Transmitter. Also comment on the UART features (only mode-1 required to be explained) available in μ C 8051.

14. a) A room's temperature is to be maintained in the range 10°C to 35°C, by switching ON a fan in case of temperature exceeding 35°C and by switching ON a heater in case of temperature going below 10°C. Draw necessary hardware and give required 8085 program for achieving this objective. Assume LM 135 temperature sensor, connected to μ P 8085 through 8255 PPI and ADC 0801.

OR

- b) i) A thumb wheel switch is connected as the input device, and two number of 7-segment LEDs connected through 7447 decoders form the output device. Both these are interfaced to μ P 8085 through 8255 PPI. Assume suitable port connection. 8255 PPI itself is required to be connected following memory mapped I/O with address range of F000- F003H. Draw the hardware connections. Also write a program which reads in the BCD input from thumb wheel switch and displays the value of its square at the 7-segment displays.
ii) Same external hardware is now connected to a μ C 8051; thumbwheel switch to port -1 and 7447 decoder ICs to the port-2. Write a program in μ C 8051 assembly language, to perform the same task. (11+5)

15. a) Along with external hardware/ power circuit and machine cross-sectional diagram, explain how a stepper motor interface can be controlled from μ P 8085 or μ C 8051.

OR

- b) Along with a neat sketch of the functional block diagram / architecture, describe the salient features available in the 8-bit micro-controller 8051. State the purpose for each of the Special Purpose Registers, mentioning if bit-addressable or not.
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