END SEMESTER EXAMINATION, May-2007
Sixth Semester, B.E. (EC/COE/IC-311)

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Time: 3:00 Hrs. Max. Marks: 70

> **Note: Attempt any FIVE questions. Assume and specify any missing data**

Q1 is Compulsory.

Q1.

(a) Draw the timing diagram of RST5 instruction. (3 marks)

(b) How and when does the 8085 CPU decide the number of bytes to be fetched from memory to execute an instruction? (2 marks)

(c) Write a single byte instruction each to perform the following operations (i) Clear Accumulator (ii) Clear Carry Flag (iii) Assume that register pair HL = 0010(hex). Make it 0020 (hex) (3 marks)

(d) Reset all the flags without performing any arithmetic or logical operations. (2 marks)

(e) For signed arithmetic, if a register of 8085 has 8F(hex) and it has to be copied in a register pair, say HL, what would be the contents of the HL register pair after the copy operation is performed? (2 marks)

(f) If 8085 processor operates on a 10 MHz crystal, and has 2 wait states for memory/opcode read/write machine cycle and 1 wait state for port read/write machine cycle, how much time would an IN 55(Hex) instruction take to execute? (2 marks)

Q2.

(a) Give the technical specifications and pin out diagram of the 8085 Microprocessor. (7 marks)

(b) Write an assembly language program for finding the sum of a set of 16-bit numbers stored in memory locations starting from 2000(hex). The number of 16-bit numbers are stored in register B. Assume that the sum will not exceed 32 bits. (7 marks)

Q3.

(a) Explain the interrupt structure of 8085 (both hardware and software) and their use. Is it possible for a lower priority interrupt to interrupt a higher priority interrupt subroutine? If yes, How? (7 marks)

(b) Design a 1-minute timer using a 50 Hz power line as an interrupting source. Choose and draw your own output display circuit, but the display should show minutes and seconds in BCD. (7 marks)

Q4.

    (a) A set of 10 bytes are stored in memory location starting 2000(hex). Write a program to check the bytes and store them in memory locations starting from 2050 (hex), if the bytes are higher than 60(decimal) or lower than 100(decimal) only. (5 marks)

    (b) Write a program to multiply two 16-bit numbers using the shift and add method. Assume product will not be more than 32-bits. (6 marks)

    (c) Write a program to continuously display the status of the SID pin on SOD output pin. (3 marks)

Q5.

    (a) Explain the mode 1 operation of 8255. (7 marks)

    (b) Design an 8085 based Traffic lights controller system using 8255 as a peripheral interface. (7 marks)

Q6.

    (a) Write a subroutine to initiate counter 0 of 8254 in mode 1. The initial count to be loaded is 0024 in BCD. It should also read the counter on the fly. When the counter reaches zero, SOD line of the 8085 should be set. Assume the base address of 8254 as 00(hex). (7 marks)

    (b) Explain all the control words used for initialization of 8279 to read a key and display the key on the 7-segment display. (7 marks)

Q7.

    (a) Explain with the help of a neat sketch, how 8259 generates the ISR address on receiving interrupt request. (7 marks)

    (b) In a master-slave configuration for 8259, a slave is connected to IR2 of the master. The base address of the master and slave are FC(hex) and FE(hex) respectively. Initialize the master and slave for the following specifications, with proper justification for your answer: 8085A system, normal EOI mode, non-buffered environment, Fully Nested Mode and call address interval of 8 bytes. All IR pins except IR2 of master and IR1, IR2, IR4 and IR6 of the slave are to be masked. The address space available for ISR of master and slave are 0F40-0F7F(hex) and 0F80 -0FBF(hex) respectively. (7 marks)

Q8   Write short notes on any two of the following:

    (a) 8251 USART. (7 marks)

    (b) 8257 DMAC. (7 marks)

    (c) Memory Interfacing with Wait States. (7 marks)

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