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17EC46

Fourth Semester B.E. Degree Examination, July/August 2021
Microprocessors

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions.*

1 a. What advantage does 8086 processor have by having two independent units Bust Interface Units (BIU) and Execution Unit (EU)? **(04 Marks)**

b. With suitable examples, explain various addressing modes of 8086 processor. **(08 Marks)**

c. The machine code of an instruction is 8907H, explain how these two bytes are interpreted? What is the Instruction? Given, Opcode of MOV instruction '100010'. **(08 Marks)**

2 a. Explain the following :
   i) Offset address   ii) Physical address
   iii) Paragraph Boundary   iv) Memory relocation. **(04 Marks)**

b. Explain the (MOD – REG – R/M) byte of an 8086 instructions. **(08 Marks)**

c. At a certain instant during the execution of a program the 8086 processor has the following data in the registers AX = 1234H , BX = 5678H , SI = 1200H , DI = ABCDH , CS = AB00H and IP = 789AH , DS = ES = 4567H.
   State the addressing modes and find physical addresses of source and destination of data, when each of the following instruction is executed.
   i) MOV BX , AX   ii) MOV [BX + DI + 120FH] , AB46H
   iii) MOV AX, [1200H]   iv) LODSW. **(08 Marks)**

3 a. Use appropriate logical instruction which performs :
   i) Set higher nibble of AL register   ii) Clear AX register
   iii) Invert even bits of BX register   iv) Clear 5th and 6th bits of CH register. **(04 Marks)**

b. Write an 8086 ALP to transfer a block of data stored at SRC to another memory area DST. The length of the block is specified at location BLK – LEN. **(08 Marks)**

c. Consider the registers of 8086 loaded with the following data :
   ES = 1234H , DS = 1224H , DI = 200H , SI = 100H , CX = 10H , DFlag = '1'.
   If now, the instruction REP MOVSW is completely executed workout the contents of above defined registers after the execution of the REP MOVSW instruction. **(08 Marks)**

4 a. What are Assembler directives? With examples, explain the data definition directives DB, DW and DD. **(04 Marks)**

b. Write an 8086 ALP to arrange an array of 'N' bytes in ascending order. **(08 Marks)**

c. Explain five string primitives of 8086. Also specify necessary initializations to be done before using the string instructions. **(08 Marks)**

5 a. Distinguish between MACROS and Procedures. **(04 Marks)**

b. Explain working of Interrupt and Trap flags of 8086 processor. Write a procedure to set trap flag and procedure to reset trap flag. **(08 Marks)**

c. With neat schematic, explain generation of NMI interrupt during power failure. **(08 Marks)**

6 a. Explain how the 8086 processor finds the address of interrupt service subroutine for particular interrupt. **(04 Marks)**

b. Explain Interrupt system of 8086 processor. Write the sequence of events takes place when an interrupt occurs. **(08 Marks)**

c. What is meant by Modular Programming? Also write a procedure to generate a delay of 2 msec, for the 8086 operated at 5 MHz. **(08 Marks)**

7 a. Compare memory mapped I/O and I/O mapped I/O interfacing schemes. **(04 Marks)**

b. Why the address demultiplexing is required in 8086 processor? Explain how it is done for minimum mode of operation. **(08 Marks)**

c. What is Wait State? How do you introduce it? Explain with necessary timing diagram with respect to 8086 processor. **(08 Marks)**

8 a. Explain the function of following 8086 pins :
i) $\overline{BHE}$ ii) ALE   iii) INTR   iv) DT/$\overline{R}$. **(04 Marks)**

b. Sketch memory read bus cycle of 8086 and explain. **(08 Marks)**

c. Explain 8255 modes of operations. **(08 Marks)**

9 a. Write 8255 control word to set PC_5. **(04 Marks)**

b. Interface a stepper motor to 8086 processor using 8255 and write an ALP to it for 180^0 in clock wise direction. **(08 Marks)**

c. Explain Mode - 0 and Mode – 3 operations of 8254. **(08 Marks)**

10 a. Bring out the differences between CICS and RISC processors. **(04 Marks)**

b. Describe any five DOS functions related with INT21H. **(08 Marks)**

c. Using DOS functions write an 8086 ALP to read a two digit hexadecimal number and display the same on the console. **(08 Marks)**

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