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06CS4

Fourth Semester B.E. Degree Examination, Dec.09/Jan.10
Microprocessors

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

Part – A

1 a. Sketch neat block diagram of internal architecture of 8086 microprocessor. Explain functions of following in brief: i) BIU ii) Queue iii) AX iv) IP v) CX vi) CS **(12 Marks)**

b. Calculate physical address of memory to access OP code and stack.
IP = C846H, CS = 8480 H, SS = C800H, SP = FFFFH. **(04 Marks)**

c. Identify memory addressing mode in the following instructions and calculate effective offset address: i) MOV AX, 1000 H ii) MOV CX, [1000H] iii) MOV al, [SI+05] iv) ADD AX, BX **(04 Marks)**

2 a. State and explain instruction format for MOV instruction to transfer data between register and memory. Also generate opcode for following instructions assuming the opcode for mov as 1 0 0 0 1 0 0 1.
i) MOV AL, BL ii) MOV AX, [BX]
iii) MOV AL, [SI+05] iv) MOV CX, [1000H] **(10 Marks)**

b. Explain following assembler directives with examples of each:
i) PROC and ENDP ii) MACRO and ENDM iii) DW, DD
iv) EVEN v) PUBLIC and EXTRN. **(10 Marks)**

3 a. Explain instructions with example of each:
i) DAA ii) XLAT iii) DIV iv) AAA v) CMP **(10 Marks)**

b. Differentiate between short, near and far jump instructions with two examples of each. **(10 Marks)**

4 a. Write an ALP which reads the user password through keyboard and check with stored correct password. Display the result as 'Valid' or 'Not valid' password on monitor by using DOS function 07 interrupt 21 H. **(08 Marks)**

b. Write an ALP to calculate delay of 100 milliseconds by using 8086 MP working at 10 MHz clock frequency. Assume the states for the instructions used. **(06 Marks)**

c. Write an ALP to compute the value of function $f(x) = 4x^2 + 8x - 20$ where x is 8 bit unsigned binary number. **(06 Marks)**

Part – B

5 a. Write an ALP to compute factorial of single digit positive number using recursive procedure. For N = 4 show the stack operations. **(08 Marks)**

b. Write procedure to unpack BCD digits from packed two digit BCD number and store the result in memory locations. **(06 Marks)**

c. List the instructions to process the flags in flag register. **(06 Marks)**

6 a. Explain with block diagram minimum mode configuration of 8086 MP. How de-multiplexing of address bus is obtained? **(10 Marks)**

b. Draw and explain the timing diagram for opcode fetch memory read cycle with one wait state for 8086 MP. **(10 Marks)**

7 a. Explain the action taken by 8086 MP when an interrupt occurs. Describe Interrupt Vector Table (IVT). **(08 Marks)**

b. Explain with neat diagram how NMI pin of 8086 MP is used to read ASCII characters through keyboard? Also write instructions to initialize IVT for NMI interrupt. **(06 Marks)**

c. Interface IC 8259 to 8086 MP with a base address of FF10H. Write initialization sequence for IC 8259 with edge triggered input, only one 8259 IC, 8086 MP, interrupt type 40 H corresponds to IR_O input, normal EOI, non buffered mode, not SFNM, IR and IR_3 are unmasked. **(06 Marks)**

8 a. With neat timing diagram explain the different types of parallel data transfer from 8255. **(06 Marks)**

b. Describe internal block diagram of IC 8255 PPI. **(08 Marks)**

c. Explain control word format for IC 8255 PPI. Write initialization sequence for IC 8255 PPI in mode 'O' with A port, B port as output and C port as input with address of A port FFOOH. **(06 Marks)**

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