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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fourth Semester, B.E. - Computer Science and Engineering

Semester End Examination; June - 2017

Microprocessor

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. List the categories of registers used in 8086 processor. Also explain their special functions, if any. 8

b. Explain the operation of instruction queue. 4

c. Describe instruction format along with special one bit indicators. 8

2 a. List the advantages of segment registers. 4

b. Define addressing mode for the instructions given below:
i) Addressing mode ii) Physical address iii) Execution time by assuming 5 mHz clock
MOV [bx], ax
MOV cl, [bx+di]
Where DS = 1000h, bx = 1572h, di = 212Ah. 6

c. Find the sum and flag settings after hexadicimally adding 62A0h to each of the following:
i) CFA0h ii) 9D60h. 4

d. Explain any two branch related addressing mode. 6

UNIT - II

3 a. Describe the use of the following instructions with an example :
i) DAA ii) LES iii) XCHG. 6

b. Develop a program to find the largest and smallest element out of N bytes of data. Store largest data in *bx* register and smallest data in *dx* register. 8

c. Differentiate between the following instruction :
i) Sub and Cmp ii) Test and And iii) MOV bx, Table, iv) Lea bx, Table. 6

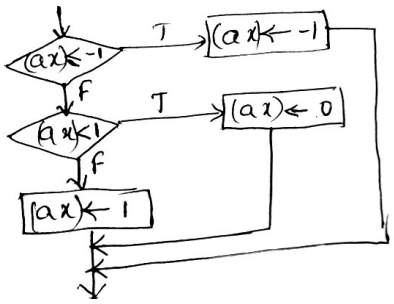
4 a. Show the allocated space and initialized data caused by the following statement :
i) Byte_var db 'byte', 12, -12h, 3 dup (0, ?, 2, dup (1, 2),?)
ii) Word_var dw 5 dup (0, 1, 2), ?, -5, 256. 4

b. Explain the following directives along with an example:
i) EQU ii) SIZE iii) SEG. 6

c. Develop a program to separate given N word array into odd array and even array. 6

d. Develop a program sequence to implement the following flow chart. 4

Contd…2



UNIT - III

5 a. List the reasons for breaking a program into small parts. 4

b. Explain with an example different types of segment combinations. 5

c. Write a program using recursive procedure to find nC_r. 8

d. List and explain different types of interrupts available in 8086 processor. 3

6. a Explain with an example the directives used to access external identifiers. 5

b. Write the macro definition named DADD that adds 2 three word memory operands and stores the result back in a three wind memory location. The dummy parameters are to be associated with the least significant words of the operands and the result. Also give the expansion resulting from the following calls. 5

% DADD (Ops, Price, Total)

c. Differentiate between the following : 5

i) Procedure and macro ii) Intersegment call and interrupt.

d. Write a FAR procedure by name search that searches a byte array for a given byte and sets the ax register to 1 if a match is found otherwise, sets the ax register to -1. 5

UNIT - IV

7 a. Explain the following instruction with an example : 6

i) cmpsb ii) SCASb iii) MOVSb.

b. Write a program to find the sum of square of two BCD numbers using look up table technique. 6

c. Write a program by choosing appropriate instructions to replace the digits present in a string with '%'. 8

8 a. With flowchart explain the operation of programmed i/o data transfer. 6

b. Write sequence of steps that occurs to transfer datum from interface to the memory during block input byte transfer. 8

c. With figure explain Daisy chain priority scheme. 6

UNIT - V

9 a. Explain the functions of following pins : 10

i) $M / \overline{IO}$ ii) HLDA iii) $\overline{LOCK}$ iv) $\overline{TEST}$ v) $\overline{RD}$.

b. Explain with timing diagram memory write cycle with wait states. 6

c. How would you use Ready signal in microprocessor system. 4

10 a. Explain with fig interrupt system based on a single 8259A. 10

b. Given 4k RAM write an interfacing diagram for 8086 to realize a memory of 16k starting at the address C0000h. 10

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