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

(An Autonomous Institution affiliated to VTU, Belgaum)

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

Make-up Examination; July - 2016

Microprocessor

Time: 3 hrs *Max. Marks: 100*

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

UNIT - I

1 a. Explain the following with respect to 8086 processor : 6

i) Pointer and Index register ii) Data registers along with their special use.

b. Explain with figure, how the instructions queue is filled by a sequence of instruction of length 1 byte, 2 bytes and 3 byte respectively. 6

c. Explain the following addressing mode along with an example. Also explain how effective address and physical address is calculated, 8

i) Direct ii) Register relative iii) Register indirect iv) Based indexed.

2 a. Give the sum and also conditional flag settings after adding the following hexadecimal number, 4

i) 0fc8dh+0f923h ii) 9436 +3cfgh.

b. Explain special one bit indicator present in op-code. 5

c. With figure explain branch related addressing modes. 6

d. Obtain the machine code for the following instruction : 5

i) add d, bh ii) add [BX +DI], dx iii) add [BX + DI + 2345h], 0ff97h.

UNIT - II

3 a. Explain with an example the following instructions : 8

i) MOV ii) INZ iii) DAA iv) IMUL.

b. Write an assembly language program find the largest of *n* numbers. 6

c. Give a sequence of instruction to set n^{th} bit, to clear $(n + 1)^{th}$ bit and to filp zeroth bit on the data present in *bl* register. Where, $6 \geq n < 0$. 3

d. Explain the following instruction with an example : 3

i) Loop ii) ROL.

4 a. Write an assembly language program to sort *n* word data into ascending order. 8

b. Define assembler directive. Explain the following with an example : 6

i) *Dup* ii) *Struc* iii) *Length*.

c. Give the sequence of instruction to evaluate the following Boolean expression and store result in *dx*, 6

$\overline{x}_1 x_2 x_1 \overline{x}_0 + \overline{x}_3 x_0 + \overline{x}_5 \overline{x}_4 x_3$

Contd…2

UNIT - III

5 a. How the segments with the same name are joined together? Explain possible combined type with figures. 10

b. Write recursive assembly language program to find the factorial of a number. 5

c. Explain with an example how external variables or functions are accessed. 5

6 a. Differentiate between procedure and macro. 5

b. Write a macro to add two byte of data using their macro write a program to add *n* bytes of data. Store result at memory called sum. 8

c. What is the role of stack in calling and returning to and from procedure? What is the size of IVT? Find the address into IVT for an instruction INT 20h. What is the main difference between INT and call statement. 7

UNIT - IV

7 a. Explain the following string manipulation instruction : 6

i) *cmps* ii) *scas* iii) *stos.*

b. Write an assembly language program sequence that compares 10 bytes beginning at char 1 with 10 bytes beginning at char 2 and store 0ffh at 2000h if they match else store 00h at 3000h. 5

c. Explain briefly different means of giving priority to an interrupt system. 9

8 a. Write an assembly language program using table translation instruction to convert BCD to seven segment display code. 6

b. What are the steps to be followed in sending data from interface to the memory during block transfer? 6

c. Write an assembly language program to find the frequency of occurrence of a given character in the string. 8

UNIT - V

9 a. Explain the function of the following pins : 10

i) DT/$\overline{R}$ ii) HLDA iii) $\overline{TEST}$ iv)MN/$\overline{MX}$ v) READY.

b. With timing diagram, explain read and write operation in minimum mode. 10

10 a. With figure explain the action taken in the normal mode when a typical sequence of interrupt occurs. 10

b. Explain with figure interrupt system based on multiple 8259 As. 10

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