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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; May/June - 2019

Microprocessor

Time: 3 hrs *Max. Marks: 100*

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

UNIT - I

1 a. Explain with a neat diagram the architecture of 8086 microprocessor. 10

b. With an example, distinguish between Physical address, Logical address and Offset address. If CS = 2000h, DS = 3000h, SS = 4000h, ES = 5000h, BX = 0020h, BP = 0030h, find physical address for; i) MOV AL, [BP] ii) MOV CX, [BX] 5

c. Explain any three data transfer instructions with an example for each. 5

2 a. Briefly explain any three addressing modes of 8086 with an example for each. 7

b. Write down the machine code for the following :

[**Hint:** Opcode for ADD : 000000, MOV: 100010]

i) ADD 2345H[BX][DI], CL ii) MOV CH, BL iii) MOV SS:2345H[BP], DX 6

c. Write an ALP to count the number of one's and zero's in a given 8-bit data using rotate instructions. 7

UNIT - II

3 a. Explain syntax of the following instructions with example :

i) ADC ii) AAA iii) DAA iv) XOR v) RCL vi) CLC 12

b. Write an ALP to add 5-bytes of data stored in data segment. 4

c. Explain the significance of REP prefix with instruction variants and example. 4

4 a. With syntax, explain conditional and unconditional control transfer instructions. 10

b. Write an ALP to convert lowercase to uppercase letters by reading string from keyboard (all in lowercase) and display the converted string on the screen. 10

UNIT - III

5 a. With neat diagram and example code, explain segment combination types. 10

b. Show the memory dump for the following data section :

```
ORG     0010H
DATA1   DB  25
DATA2   DB 10001010B
DATA3   DB  12H
        ORG  0020H
DATA4   DB '2591'
        ORG  0040H
DATA5   DW   9, 2, 7, 0CH, 01001101B, 5
        ORG  0050H
DATA6   DW   4DUP (00H)
```

4

Contd… 2

c. What is Recursion? Explain. Write an ALP to find the factorial of a single digit positive number using recursive procedure. 6

6 a. Differentiate between; 6

i) Assembler and Linker ii) PUBLIC and EXTERN iii) Macros and Procedure

b. What are the sequence of actions taken by 8086 and the devise, when a device interrupts 8086 over INTR line? Explain about the software and recurred internal interrupts of 8086. 8

c. Explain the stack structure of 8086 and the operations of PUSH and POP instructions. 6

UNIT – IV

7 a. With a neat diagram, explain concept of programmed I/O. 10

b. With a neat sketch, explain the functioning of 8255 PPI. 10

8 a. Explain the concept of interrupt driven I/O. 10

b. Discuss the control word format of 8255 PPI with a sketch. 10

UNIT - V

9 a. Explain the memory read bus cycle of 8086 in minimum mode with a neat diagram. 10

b. With neat diagram, explain interrupt system based on a single 8259A. 10

10 a. Sketch the maximum mode configuration of 8086 and explain the operation briefly. 10

b. With neat timing diagram, explain memory read cycle. 10

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