



# 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] 6
- i) ADD 2345H[BX][DI], CL      ii) MOV CH, BL      iii) MOV SS:2345H[BP], DX
- 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 : 12
- i) ADC      ii) AAA      iii) DAA      iv) XOR      v) RCL      vi) CLC
- 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 : 4
- ```

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)
```

- 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 device, 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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