

# CBCS SCHEME



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17EC46

## Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020 Microprocessors

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Define Microprocessor. Describe the architecture of 8086 with neat block diagram. (10 Marks)  
b. Explain flag register of 8086 with its format. (08 Marks)  
c. Explain the formation of opcode for MOV AX, BX. Opcode for MOV instruction is "100010". (02 Marks)

OR

- 2 a. Explain the following addressing modes of 8086:  
(i) Register Addressing mode (ii) Based Indexed mode. (08 Marks)  
(iii) Immediate mode (iv) Direct addressing mode  
b. Write 8086 program to find the smallest number out of N 16 bit unsigned numbers stored in a memory block starting with the address 2000H. Store the result at word location 3000H. (08 Marks)  
c. Explain the significance of following pins of 8086:  
(i) ALE (ii) RESET (iii)  $\overline{\text{TEST}}$  (iv)  $\overline{\text{M}/\overline{\text{IO}}}$  (04 Marks)

### Module-2

- 3 a. Explain the following instruction with examples:  
(i) LEA (ii) IDIV (iii) XLAT (iv) TEST (08 Marks)  
b. Write a complete assembly language program in 8086 which determines all the occurrences of a character in a given string. (08 Marks)  
c. What are assembler directives? Explain any three. (04 Marks)

OR

- 4 a. List and explain the string manipulation instructions. Also give its advantages. (10 Marks)  
b. Write an ALP to copy a 100 byte block of data from LOC1 to LOC2 using the MOVS instructions. (06 Marks)  
c. Write an ALP to find whether the given number is 2 out of 5 code. (04 Marks)

### Module-3

- 5 a. Explain the stack structure of 8086 and the operations of PUSH and POP instructions with examples. (08 Marks)  
b. Differentiate between procedure and macro. (06 Marks)  
c. Write an ALP to change a sequence of sixteen 2 byte numbers from ascending to descending order. Store the new series at different address. Use LIFO property of the stack. (06 Marks)

OR

- 6 a. Explain the type of interrupts and the action taken by the 8086 when an interrupt occurs in detail. (06 Marks)  
b. Explain the interrupt acknowledgement cycle of 8086 with the neat timing diagram. (06 Marks)  
c. Write a program to generate a delay of 100ms using an 8086 system that runs on 10 MHz frequency. Show the calculations. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

**Module-4**

- 7 a. Sketch the minimum mode configuration of 8086 and explain the operation briefly. (08 Marks)
- b. Interface two 4k×8 EPROM and two 4k×8 static RAM chips of 8086. The addresses of RAM and ROM should start from FC000H and FE000H respectively. (08 Marks)
- c. Draw the timing diagram for  $\overline{RQ}/\overline{GT}$  for maximum mode. (04 Marks)

**OR**

- 8 a. Write the control word format of 8255 PIA. (06 Marks)
- b. Show an interface of keyboard of 8086 and explain with a flowchart. (10 Marks)
- c. How is key Debounce achieved through hardware? (04 Marks)

**Module-5**

- 9 a. Explain the internal architecture of 8087. (06 Marks)
- b. Write a program to read analog input connected to the last channel of ADC0808 interfaced to 8086 using 8255 and digital value to be stored at location 3000h. (06 Marks)
- c. Explain the following INT 21K DOS function calls:  
(i) Function 01H (ii) Function 02H (iii) Function 09H (iv) Function 0AH (08 Marks)

**OR**

- 10 a. Write an ALP to rotate a stepper motor by 100 steps in clockwise direction for a 1.8 degree connected to 8255 port. Show details of calculations. Motor is rotating at 12 rpm and processor speed is 10 MHz. (08 Marks)
- b. Explain Von-Neumann and Harvard CPU architecture and USC and RISC CPU architecture. (08 Marks)
- c. Write a program to generate triangular wave using DAC 0800. (04 Marks)

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