



CBCS SCHEME

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) $\overline{\text{M/IO}}$ (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)

1 of 2

F7 JAN 2020

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)
