

# CBCS SCHEME

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15EC42

Fourth Semester B.E. Degree Examination, Jan./Feb.2021

## Microprocessors

Time: 3 hrs

Max. Marks: 80

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

### Module-1

- 1 a. Define Microprocessor. With a neat diagram, describe the architecture of 8086. (08 Marks)
- b. Explain the significance of following pins of 8086:  
(i) ALE (ii)  $\overline{MN}/\overline{MX}$  (iii)  $M/\overline{I}/\overline{O}$  (iv)  $\overline{DT}/\overline{R}$ . (04 Marks)
- c. Write an ALP to reverse a data block without using a dummy block. (04 Marks)

OR

- 2 a. The Opcode for MOV instruction is "100010". Determine Machine Language code for the following instructions:  
(i) MOV BL, CL (ii) MOV [S1], DL (04 Marks)
- b. Explain the following instructions, with examples:  
(i) XLAT (ii) LDS (iii) AAM (06 Marks)
- c. Write an ALP to add two, 16 bit (4 digit) BCD numbers. Ignore the end-around carry. (06 Marks)

### Module-2

- 3 a. Write an ALP to convert a 16 bit binary number to BCD. (06 Marks)
- b. If AX = 1234 H, Trace the output in AX after the execution of following instructions :  
(i) SHL AX, 1 (ii) ROR AX, 1 (04 Marks)
- c. Explain any three string instructions of 8086. (06 Marks)

OR

- 4 a. Write an ALP to find number of 1's and 0's in a given 16 bit number. (06 Marks)
- b. What are assembler directives? Explain the following assembler directives with an example:  
(i) DW (ii) OFFSET. (06 Marks)
- c. Explain any four Flag Manipulation Instructions of 8086. (04 Marks)

### Module-3

- 5 a. Explain the stack structure of 8086. (06 Marks)
- b. Explain the Interrupt cycle of 8086. (04 Marks)
- c. Write an ALP to find factorial of a 8 bit binary number. (06 Marks)

OR

- 6 a. Explain passing parameters to procedures with an example program. (06 Marks)
- b. Explain MACROS in 8086, with an example. (04 Marks)
- c. Write a program to generate a delay of 10 minutes using 8086 microprocessor operating on 10 MHz frequency. Show delay calculation in detail. (06 Marks)

- Module-4**
- 7 a. Explain maximum mode of 8086 with a neat block diagram. Write the memory read timing diagram. (10 Marks)
- b. Explain I/O addressing capability of 8086. (06 Marks)

**OR**

- 8 a. Design an Interface between 8086 CPU and two chips of 16K×8 EPROM and two chips of 32K×8 RAM. Select the starting address of EPROM suitably. The RAM address must start at 0000H. (08 Marks)
- b. Explain the BSR mode of operation of 8255. (04 Marks)
- c. What do you mean by key debouncing? Explain key debouncing circuit. (04 Marks)

**Module-5**

- 9 a. Interface ADC 0808 with 8086 using 8255 ports. Use Port A of 8255 for transferring digital data out of ADC to the CPU and Port C for control signals. Assume that an analog input is present at I/P2 of the ADC and a clock input of suitable frequency. Draw the schematic and write a program to convert an analog data to digital using ADC interface. (08 Marks)
- b. Explain the following keyboard handling INT21H DOS function:  
 (i) 01H (ii) 02H (iii) 09H (iv) 0AH (08 Marks)

**OR**

- 10 a. Interface an 8255 with 8086 at 80H as an I/O address of port A. Interface five 7 segment displays with the 8255. Write a sequence of instructions to display 1, 2, 3, 4 and 5 over five displays continuously as per their positions starting with 1 at the least significant position. (10 Marks)
- b. Discuss the interface between 8086 and 8087 Numeric processor with a neat diagram. (06 Marks)

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