

# CBCS SCHEME

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15EC42

## Fourth Semester B.E. Degree Examination, Dec.2018/Jan.2019 Microprocessors

Time: 3 hrs.

Max. Marks: 80

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

### Module-1

- 1 a. Explain the flag register of 8086 in detail with neat diagram. (08 Marks)
- b. Explain in detail with examples any 4 addressing modes of 8086. (06 Marks)
- c. Opcode for MOV instruction is "100010", explain the formation of opcode for MOV AX, BX. (02 Marks)

OR

- 2 a. With a neat block diagram explain the internal architecture of 8086. (08 Marks)
- b. Write an 8086 assembly language program to sort a block of 20 eight bit numbers at LOC1 into even and odd numbers, save them at EVN and ODD. (06 Marks)
- c. Explain the working of following 8086 instructions:  
(i) MOV AX, [SI] (ii) ADD BYTE PTR [DI], 3 (02 Marks)

### Module-2

- 3 a. Write an ALP to add two ASCII numbers N1 and N2 and save the result at RES as a hexadecimal number. (08 Marks)
- b. Write an ALP to replace the "##" in a given string of 50 characters with "\*\*". (08 Marks)

OR

- 4 a. What are assembler directives? Explain the following assembler directives :  
(i) DQ (ii) ASSUME (iii) DUP. (04 Marks)
- b. Write an ALP to copy a 100 Byte block of data from LOC1 to LOC2 using the MOVS instruction. (06 Marks)
- c. A two digit BCD number is typed using a keyboard. Write an ALP to read the value, save it as BCD number at LOC as packed BCD. (06 Marks)

### Module-3

- 5 a. Describe the purpose of the interrupt vector table of 8086 processor and conditions which cause the following interrupts Type 0; Type 2; Type 4. (08 Marks)
- b. What are the differences between MACRO and PROCEDURE? (04 Marks)
- c. Write a procedure DELAY which performs 10 msec delay with 8086 processor @ 10MHz. Show the calculations of the delay. (04 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 MACRO to create a DELAY where the delay parameter is passed on to the macro. (04 Marks)

**Module-4**

- 7 a. With a neat diagram explain the control register of 8255 in detail. (06 Marks)  
 b. Write ALP to setup 8255 so that port A is input port B is output and PC0-3 are input, PC4-7 are output ports. Assume 8255 is mapped as IO at 40H. Show with neat diagram the hardware connection of 8086 to 8255 using 74LS138 decoder to generate  $\overline{CS}$  logic. (10 Marks)

**OR**

- 8 a. With neat diagram explain maximum mode of operation of 8086. (06 Marks)  
 b. 8086 is interfaced through a 8255 to a 4 by 4 keypad where Port C4-7 is connected to column and PC0-3 to row. 8255 is in isolated IO mode at location 40H. Write ALP to setup 8255 and read the key pressed to display on screen as "ROW#: \_\_" and "COLUMN#: \_\_". Assume a 50 msec delay routine DELAY50 is available to you. (10 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 working of DOS21H interrupt when AH = 09h and AH = 02h. (04 Marks)

**OR**

- 10 a. Write an ALP to rotate 100 steps in clockwise direction for a 1.8 degree stepper motor connected to 8255 port. Show details of calculations. Motor to rotate at 12 rpm. Processor speed is 10 MHz. (08 Marks)  
 b. Explain the control register of 8253/54 in detail. (06 Marks)  
 c. Explain the difference between CISC and RISC Architecture. (02 Marks)

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