

# CBCS SCHEME

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17EC46

## Fourth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Microprocessors

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain in brief the internal architecture of 8086 microprocessor with a neat diagram along with functions of each block. (10 Marks)
- b. Explain the advantages of the segmented memory scheme. (05 Marks)
- c. If DS = AB30h, CS = 8920h, SS = 3B01h, BP = 2D45h, SP = 0130h, SI = 1234h, DI = 4356h, then determine the physical address of the following instructions:  
i) MOV [BP + DI + 5], AH      ii) MOV AL, [5036H]. (05 Marks)

OR

- 2 a. Explain with example, the following addressing modes in 8086.  
i) Register addressing mode  
ii) Base plus index addressing mode  
iii) Variable port addressing mode  
iv) Stack addressing mode. (08 Marks)
- b. What is wrong with the following instructions: i) POP CS      ii) MOV [AX], 20h  
iii) MOV SS, DS      iv) MOV BL, SI. (04 Marks)
- c. Given the opcode 8907h, explain how these two bytes are interpreted in machine language. What is the resulting instruction? (08 Marks)

### Module-2

- 3 a. What are assembler directives? Explain the action performed by the following directives:  
i) Price db(?)  
ii) Proc ..... ENDP  
iii) ALIGN 16  
iv) ASSUME  
v) EXTRN (06 Marks)
- b. Write an ALP to add 'N' one byte BCD numbers and store result in memory location. (08 Marks)
- c. Explain the use of REP prefix for MOVS and STOS instructions. (06 Marks)

OR

- 4 a. Write a program that convert an 8 bit binary number into equivalent gray code. (06 Marks)
- b. Write a program to find out the number of positive and negative numbers from a given series of signed numbers. (06 Marks)
- c. Explain the flag manipulation and processor control instructions. (08 Marks)

### Module-3

- 5 a. Define stack. Illustrate with diagram, how stack top address calculation will be calculate with push and pop instructions. Assume SS = 5000h and SP = 3500h. (06 Marks)
- b. Bring out the differences between MACRO and procedure. (04 Marks)
- c. Illustrate with example, the various parameter passing techniques to a procedure. (10 Marks)

OR

- 6 a. Describe the purpose of interrupt vector table and conditions which causes the processor to perform the following types of interrupts type 0, type 1, type 2, type 3 and type 4. (06 Marks)  
b. Write an interrupt procedure that sets trap flag to enable trap. (04 Marks)  
c. Write a program to generate a delay of 100ms using an 8086 system that runs at 10MHz frequency. (10 Marks)

Module-4

- 7 a. Show the timing diagram to execute a memory write operation in 8086 in minimum mode. (10 Marks)  
b. Explain with neat diagram, I/O addressing capability of 8086. (10 Marks)

OR

- 8 a. Interface two 4K × 8 EPROMS and two 4K × 8 RAM chips with 8086. Select suitable address maps. (10 Marks)  
b. Explain the programmable peripheral interface (PP1) with command bytes of command register. (10 Marks)

Module-5

- 9 a. Interface DAC with 8086 CPU running at 8MHz. Write an ALP (Assembly Language Program) to generate a triangular wave for frequency 500Hz. (10 Marks)  
b. Interface 0808 ADC to 8086 using 8255 port A and port C. (10 Marks)

OR

- 10 a. Write a short note on:  
i) RISC and CISC CPU architecture  
ii) With block diagram, explain the internal block diagram of 8254 (timer). (10 Marks)  
b. Explain the following DOS system call INT21h function:  
i) INT21H, Function 01h  
ii) INT21H, Function 08h  
iii) INT21H, Function 0Ah  
iv) INT21H, 2Bh  
v) INT2h, Fun 2Dh (10 Marks)

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