

17431**14115****3 Hours / 100 Marks**

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.
 (2) Answer each next main Question on a new page.
 (3) Illustrate your answers with neat sketches wherever necessary.
 (4) Figures to the right indicate full marks.
 (5) Assume suitable data, if necessary.

Marks**1. (A) Attempt any SIX of the following :****12**

- (i) List any four salient features of 8085 microprocessor.
- (ii) State the names of segment registers in 8086 microprocessor.
- (iii) Define addressing mode. List any two addressing modes of 8086 microprocessor.
- (iv) Define flowchart & algorithm.
- (v) List the names of flags in flag register of 8085 microprocessor.
- (vi) Define pipelining. What is the size of instruction prefetch queue in 8086 microprocessor ?
- (vii) Write any two differences of FAR & NEAR procedures.
- (viii) Write assembly language instructions of 8086 microprocessor to :
 - (a) Add 100 H to the contents of AX register.
 - (b) Rotate the contents of AX towards left by 2 bits.

(B) Attempt any TWO of the following :**8**

- (i) State the functions of
 - (a) Editor
 - (b) Assembler
- (ii) List any four assembler directives. State the functions of any two assembler directives.
- (iii) What do you mean by re-entrant procedures ? Write any assembly language program with re-entrant procedure.

**P.T.O.**

17431

[2]

2. Attempt any FOUR of the following :**16**

- (a) List & explain the functions of all general purpose registers of 8085 microprocessor.
- (b) Draw the neat labelled architecture of flag register of 8086 microprocessor.
- (c) State all the control signals generated by S0, S1, S2 with their functions.
- (d) Compare 8085 microprocessor & 8086 microprocessor. (with respect to)
 - (i) No. of data lines
 - (ii) No. of address lines
 - (iii) Frequency of operation
 - (iv) Registers
- (e) What will be contents to AX register after execution of following lines of code :

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MOV AL, 10
MOV DL, 20
MUL DL
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- (f) Describe the physical memory address generation process in 8086 microprocessor. If, CS = 69FAH & IP = 834CH, calculate the physical address generated.

3. Attempt any FOUR of the following :**16**

- (a) Write any two arithmetic instructions & logical instructions with their functions. Give the syntax with one example each.
- (b) State the functions of following pins of 8086 microprocessor :
 - (i) ALE
 - (ii) DT / \bar{R}
 - (iii) M / \overline{IO}
 - (iv) HOLD

17431

[3]

- (c) Draw the interfacing of 8284 clock generator with 8086 microprocessor. List and explain interfacing signals.
- (d) List & explain any four string operation instructions with their functions & syntax.
- (e) Write an assembly language program to add two 16 bit numbers.
- (f) Write any four important functions of any two units of 8086 microprocessor.

4. Attempt any FOUR of the following :

16

- (a) Identify the addressing modes of following instructions :
 - (i) MUL AL, BL
 - (ii) MOV AX, BX
 - (iii) MOV BX, [S1]
 - (iv) MOV DX, 0040H
- (b) Explain the following instructions of 8086 microprocessor with their syntax :
 - (i) STRCMP
 - (ii) ADD
- (c) Write an assembly language program to find smallest number from array of 5 elements.
- (d) Write an assembly language program to find the length of a string using 8086.
- (e) Write an assembly language program to add two BCD numbers using 8086.
- (f) Define Macro. Write assembler directives used in Macros. Explain.

5. Attempt any FOUR of the following :

16

- (a) Write an assembly language program to add the series of 5 numbers.
- (b) What will be the contents of AL, BL, AX, DX registers, after the execution of all 4 lines :

MOV AL, 03H

MOV BL, 03H

SUB AL, BL

MUL AL, 08H

Also write which flags will be affected ?

P.T.O.

17431

[4]

- (c) Write an assembly language program to add only odd numbers in the list of following elements :

6, 5, 21, 3, 8, 9

- (d) Write an assembly language instructions to perform following operations :
- (i) Move contents of memory location pointed by DI into BX register.
 - (ii) Copy a string from one memory location to another using string manipulation instruction.
- (e) What are the functions of CALL & RET instructions ? Write syntax of CALL & RET instructions.
- (f) What do you mean by recursive procedure ? Write an assembly language program using recursive procedure to find factorial of a number.

6. Attempt any TWO of the following :

16

- (a) With the neat diagram, describe the maximum mode operation of 8086. List & describe functions of signals of maximum mode of 8086.
 - (b) Write an assembly language program to sort the array of 5 elements in ascending order. Also draw the flowchart for the same.
 - (c) Write an assembly language program to multiply two 8 bits numbers using NEAR procedure. Also draw the flowchart for the same.
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