

# 17431

**15162**

**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.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

- 1. a) Attempt any SIX of the following:** **12**
- (i) State the function of following pins of 8085 microprocessor.
- (1) Ready
- (2) Trap
- (ii) Draw labelled flag register format of 8086 microprocessor.
- (iii) State any two example of immediate addressing mode and two example of direct addressing mode.
- (iv) Define flowchart and algorithm.
- (v) List any four salient features of 8085 microprocessor.
- (vi) What is pipelining ? How it is implemented in 8086 microprocessor.
- (vii) State any two differences between NEAR and FAR procedure.

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- (viii) Write an assembly language instructions of 8086 microprocessor to
- (1) Divide the content of AX register by 50H
  - (2) Rotate the content of BX register by 4 bit toward left.
- b) **Attempt any TWO of the following:** **8**
- (i) State function of linker and assembler.
  - (ii) Explain the following assembler directives.
    - (1) ORG
    - (2) EQU
    - (3) DD
    - (4) ASSUME
  - (iii) What is MACRO ? Explain MACRO with suitable example.
2. **Attempt any FOUR of the following:** **16**
- a) Draw the labelled flag register format of 8085 and explain the function of all flags.
  - b) Draw the neat labelled architecture diagram of 8086 microprocessor.
  - c) State the function of the following pins of 8086 microprocessor.
    - (i) NMI
    - (ii)  $\overline{\text{TEST}}$
    - (iii)  $\overline{\text{DEN}}$
    - (iv)  $\text{MN}/\overline{\text{MX}}$
  - d) Explain the function of Stack Pointer (SP) and Program Counter (PC) of 8085 microprocessor.
  - e) Analyse the content of AL register and status of carry and auxiliary carry flag after the execution of following instructions.  
MOV AL, 99H  
ADD AL, 01H  
DAA
  - f) Explain how 20 bit physical address is generated by 8086 microprocessor. Calculate physical address if CS = 2308H and IP = 76A9H.

- 3. Attempt any FOUR of the following:** **16**
- a) Explain DAA instruction with suitable example.
  - b) State all the control signal generated by  $S_0$ ,  $S_1$ ,  $S_2$  with their function by 8086 microprocessor.
  - c) Draw interfacing diagram of 74LS373 octal latch with 8086 microprocessor and explain it.
  - d) Explain any two string operation instructions with suitable example.
  - e) Write an assembly language program to multiply two 16 bit number.
  - f) Differentiate between 8085 and 8086 microprocessor.  
(Any four points)
- 4. Attempt any FOUR of the following:** **16**
- a) Identify the addressing mode of following instructions.
    - (i) INC [4712H]
    - (ii) ADD AX, 4712H
    - (iii) DIV BL
    - (iv) MOV AX, [BX + SI]
  - b) Explain the following instructions of 8086 with suitable example.
    - (i) XLAT
    - (ii) AAA
  - c) Write an assembly language program to subtract two 16 bit numbers.
  - d) Write an assembly language program to find largest number from array of 10 numbers.
  - e) Write an instructions of 8086 to perform following operation.
    - (i) Shift the content of BX register 3 bit toward left.
    - (ii) Move 1234H in DS register.
  - f) Explain the re-entrant procedure with suitable diagram.

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

- a) Write an assembly language program to find length of string.
- b) How many times LOOP1 will be executed in the following program. Write the content of AL register after the execution of following program.  

```
MOV CL, 00H  
MOV AL, 00H  
LOOP1: ADD AL, 01H  
DEC CL  
INZ LOOP1
```
- c) Write an assembly language program to count numbers of '1' (ones) in 16 bit number stores in BX register.
- d) Explain the following instructions of 8086 with suitable example.
  - (i) LOOP
  - (ii) INT D.
- e) Explain CALL and RET instructions with suitable example. Write syntax of CALL and RET instructions.
- f) Write an assembly language program using MACRO to perform following operations.

$$X = (A + B) * (C + D)$$

**6. Attempt any TWO of the following:****16**

- a) Draw and explain the timing diagram of 8086 in minimum mode.
  - b) Write an assembly language program to sort 10 numbers in array in descending order. Draw the flow-chart for it.
  - c) Write an assembly language program for sum of series of 10 numbers using procedure. Also draw the flow-chart for the same.
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