# 17431

**21415**

**3 Hours / 100 Marks**    Seat No.

*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.**    **Attempt any FIVE of the following:**    **20**

a) Describe how 20 bit physical address is generated in 8086 microprocessor. Give one example.

b) Describe various addressing modes used in 8086 instructions with example.

c) List all 16 bit registers in 8086 and write their functions.

d) State the function of the following pins of 8086

(i)   NMI

(ii)  $\overline{\text{TEST}}$

(iii) $\overline{\text{DEN}}$

(iv)  MN/$\overline{\text{MX}}$

**Marks**

e) Describe memory segmentation in 8086 microprocessor and list it's four advantages.

f) Identify addressing modes in following instructions:

   (i)   MOV AX, 2050H

   (ii)  STC

   (iii) MOV AL, DS : [SI]

   (iv)  INC BX

g) Write difference between the following instructions
   JNC 2000 H and JMP 2000 H

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

a) Write algorithm and assembly language programme for 8086 to find largest number among block of data. Assume block size = 15.

b) Define MACRO, Give an example indicating how a MACRO can be used in 8086 ALP

c) Explain the minimum mode configuration of 8086 microprocessor. Write comparison between 8086 in minimum mode and maximum mode.

**Marks**

3. **Attempt any <u>FOUR</u> of the following:** **16**

a) Describe reentrant procedure with the help of schematic diagram.

b) What will be content of register BX after execution of instructions.

MOV    BX,  2050H

MOV    CL,  05H

SHL    BX,  CL

c) State functions of following assembly language programming tool.

   (i)   Assembler

   (ii)  Linker

d) Differentiate between following instructions:

   (i)   ROL,   RCL

   (ii)  ADD,   ADC

   (iii) MOV,  LXI

   (iv) JMP,   JNC

e) Draw a neat labeled functional block diagram of 8085. State the function of ALU.

f) Write an ALP to add BCD numbers in an array of 10 numbers. Assume suitable array with BCD numbers. Store the result at the end of array.

Marks

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

a) Write an ALP for 8086 to sort the array in ascending order. Draw flowchart. [Assume array of size 10]

b) Explain NEAR CALL and FAR CALL procedure.

c) Write the difference between PROCEDURE and MACRO.

d) Write the difference between 8085 and 8086 with respect to

   (i) Register size

   (ii) Address bus size

   (iii) Pipelining

   (iv) Segmented memory

e) Describe various string instructions in brief.

f) Explain pipelining in 8086 microprocessor. How is queuing useful in speeding up the operation of 8086 microprocessor.

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

a) Draw architecture of 8086 and label it. Write the functions of BIU and EU.

b) Write ALP to concatenate two strings with algorithm

   String 1 : "Maharashtra board"

   String 2 : "of technical Education"

c) Describe following assembler directives:

   (i) DB

   (ii) ASSUME

   (iii) SEGMENT

   (iv) EQU

**Marks**

6. **Attempt any <u>FOUR</u> of the following:**      **16**

   a) Write an ALP to count the number of '1' in a 16 bit number. Assume the number to be stored in BX register. Store the result in $C_X$ register.

   b) Explain maskable and non maskable interrupt used in 8086.

   c) Explain stack operation. Why PUSH and POP instructions are used before and after CALL sub-routine?

   d) Draw the flag register format of 8085 microprocessor and explain all the flags.

   e) Write algorithm to transfer block of data from source address to destination address and vice versa [overlapping block transfer].

   f) Compare between Jump and call instruction in 8086.

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