313305

3 Hours / 70 Marks   Seat No.

Instructions –   (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer 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:**   **10**

a) Define nibble and word.

b) Define following terms –

   i)   Minterm

   ii)   Maxterm.

c) Draw the labelled format of flag register of 8086.

d) State the use of following directives with suitable example –

   i)   DD

   ii)   DQ.

e) Write an assembly language program to add two 8 bit number.

f) State any two applications of flip flop.

g) State any two instructions with format.

Marks

2. **Attempt any THREE of the following:** **12**

a) Convert the following –

   i) $(120)_{10} = (?)_2$

   ii) $(126)_8 = (?)_{16}$

b) Minimize the following Boolean expression using. K-map and draw the logical diagram of minimize expression using logic gates –

   $Y = (A,B,C,D) = \Sigma m(1, 3, 5, 7, 8, 10, 14)$

c) Draw neat labelled interfacing diagram of 8086 in minimum mode.

d) Describe DAA instruction with suitable example.

3. **Attempt any THREE of the following:** **12**

a) Convert the following expression into canonical SOP –

   i) $A + CD + BC$

   ii) $\overline{A} (\overline{B} + C)$.

b) Describe following string instruction with suitable example –

   i)   MOVSB

   ii)   CMPSW.

c) Write an assembly language program to find smallest number from the array of 10 numbers.

d) State and prove De-Morgan's theorem using truth table.

4. **Attempt any THREE of the following:** **12**

a) Subtract following numbers using 2's complement method –

   i) $(11011)_2 - (1010)_2$

   ii) $(10111)_2 - (11000)_2$

b) Design half adder using K-map and basic gates.

c) Describe the function of following pins of 8086 –

   i) $DT/\overline{R}$

   ii) $\overline{RD}$

   iii)   ALE

   iv)   READY.

    d) Describe any four addressing modes with suitable example.

    e) Write an assembly language program to count the occurrence of a given number in the array of 10 numbers.

**5.**   **Attempt any <u>TWO</u> of the following:**   **12**

    a) Reduce the following Boolean expression using Boolean laws –

        i) $Y = A\overline{B} + \overline{A}B + AB + \overline{A}\ \overline{B}$

        ii) $Y = A\overline{B} + \overline{A}C + ABC.$

    b) Describe the concepts of memory segmentation with suitable diagram. Calculate the physical address of code segment if IP = 5000 H and CS = [6028H].

    c) Identify the addressing mode of the following instructions –

        i)   MOV BL, [4000H]

        ii)   AND [SI], AX

        iii)   SUB BX, 2000H

        iv)   MOV AX, [BX + SI]

        v)   OR AX, BX

        vi)   MOV AX, [BX + SI + 80H].

Marks

6. **Attempt any TWO of the following:** 12

a) Write an output for each of the following input with reference to Figure No. 1 below -

A	B	C	Y
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	
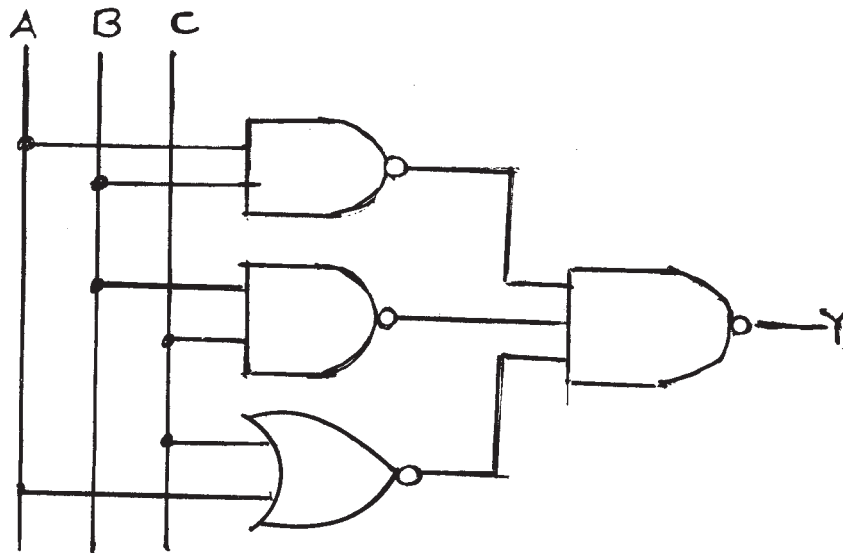
Fig. No. 1

b) Write an instructions to perform following operations –

i) Multiply BL by 90H.

ii) Signed division of AL by BL.

iii) More 5000H to DS Register.

iv) Rotate the content of AX toward left four times.

v) Shift the content of BX toward right three times.

vi) Load SS with FFFOH.

c) Write an assembly language program to concatenate two strings.

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