

22323

21819

3 Hours / 70 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) Assume suitable data, if necessary.
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following:** **10**
- State the function of linker and debugger.
 - List any four addressing modes and give one example of each.
 - State any two Boolean laws with expression.
 - Define:
 - Bit
 - Nibble
 - Convert following number into its equivalent Binary Number $(146.25)_{10}$.
 - Define Minterm and Maxterm.
 - Draw three variable K-map format.

P.T.O.

2. Attempt any THREE of the following: 12

- a) Draw symbol and truth table of D and T flip flop. State their applications.
- b) Minimize the following function using K-map.
 $F = \sum m (0,1,2,3,11,12,14,15)$.
- c) Perform binary subtraction using 2's complement of the following:
 - i) $(63)_{10} - (20)_{10} = ?$
 - ii) $(34)_{10} - (48)_{10} = ?$
- d) Simplify the following Boolean expression
 - i) $Y = AB + ABC + \overline{A}B + \overline{A}\overline{B}C$
 - ii) $Y = (A + B) (A + \overline{B}) (\overline{A} + B)$.

3. Attempt any THREE of the following: 12

- a) Draw 8086 architecture block diagram and state the functions of EV and B/V.
- b) Design half adder using K-map and realize it using basic gate.
- c) Construct NOT, AND, OR, NOR gates using NAND gate.
- d) Interpret the given program and specify the output for the following situation.


```
MOV AX, 34F9H
MOV BX, 3A69H.
```

 - (i) Masking of lower nibble of AX.
 - (ii) Rotate right through carry contents of BX by 4 positions.
 - (iii) Shift left contents of BX by 6 positions.
 - (iv) XOR AX, BX

- 4. Attempt any THREE of the following:** **12**
- a) Explain the concept of pipelining.
 - b) Explain concept of physical address calculation with suitable diagram and examples.
 - c) State and prove De-Morgan's Theorems.
 - d) Describe race-around condition in JK flip flop and suggest ways to overcome it.
 - e) Compare combinational and sequential circuits (four points).
- 5. Attempt any TWO of the following:** **12**
- a) Write an assembly language program with algorithm for finding smallest number from the array of 10 numbers (Assume suitable data).
 - b) Draw minimum mode configuration of 8086 and explain the function of any four control signals.
 - c) List the addressing modes of 8086 and describe them with an example.
- 6. Attempt any TWO of the following:** **12**
- a) Define the following term with respect the digital IC's:
 - (i) Propagation delay
 - (ii) Fan in
 - (iii) Fan out
 - (iv) Power Dissipation
 - (v) Noise Margin
 - (vi) Threshold Voltage.
 - b) Write an assembly language program to arrange any array of 10 bytes in ascending order. Draw flowchart for the same.

- c) Refer given Fig. No. 1 and write the outputs for each of the following input:

A	B	C	F
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

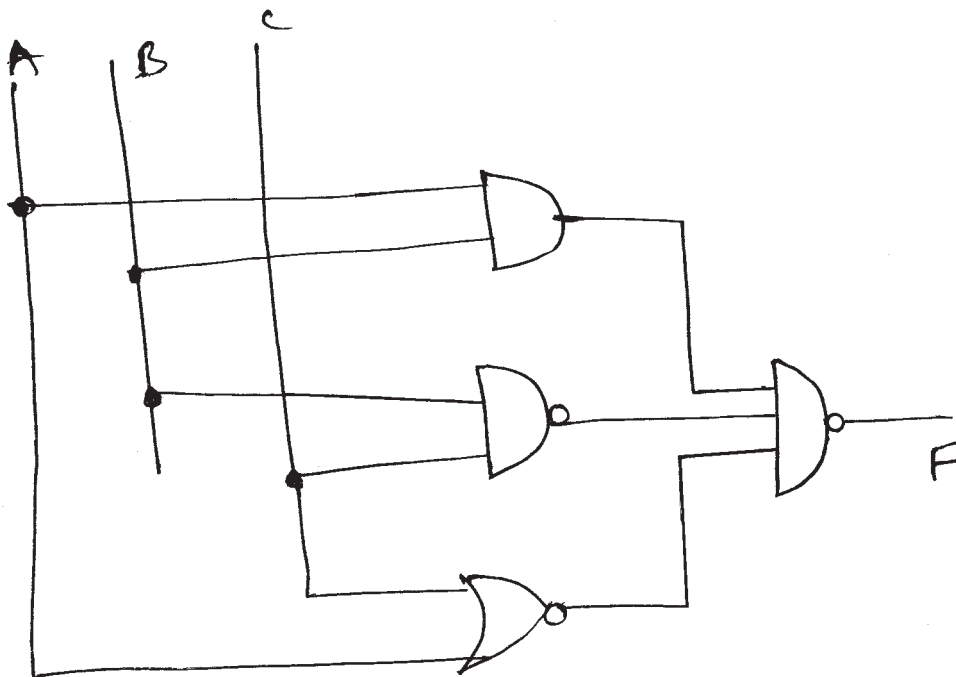


Fig. No. 1