

# 22323

11819

**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) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (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**
- a) Draw symbol and write truth table of EX-OR gate.
  - b) Define terms “Minterm” and “Maxterm” with proper example of each.
  - c) Draw symbol of JK flipflop and write its truth table.
  - d) State importance of pipelining in 8086 microprocessor.
  - e) Give any four applications of digital circuits.
  - f) Define the following terms -
    - (i) Physical Address
    - (ii) Effective Address
  - g) Choose instruction for following situations:
    - (i) Addition of 16 bit Hex. No with carry
    - (ii) Division of 8 bit No.
    - (iii) Rotate content of BL by 4 bit.
    - (iv) Perform logical AND operation of AX and BX.

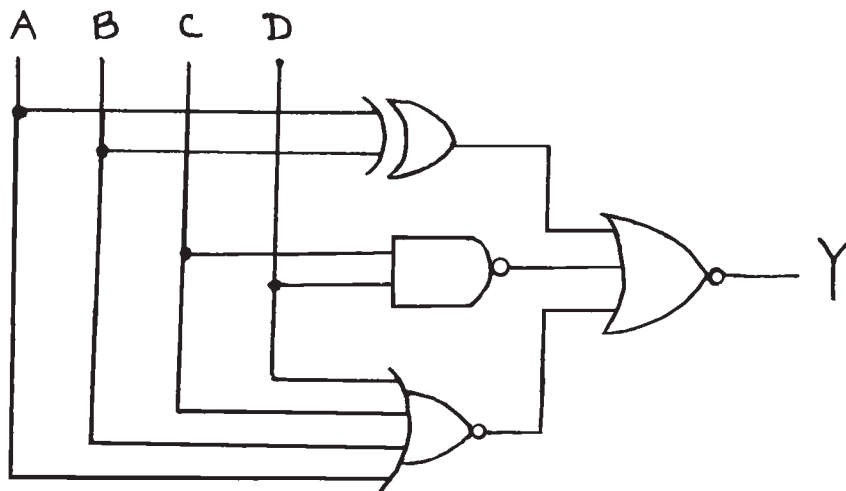
P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Convert following decimal to octal and Hexadecimal
- (i)  $(297)_{10} = ( \quad )_8$
- (ii)  $(453)_{10} = ( \quad )_{16}$
- b) Convert the given minterm into standard POS form  
 $Y(A,B,CD) = (\bar{A} \cdot BC) + (B \cdot \bar{C} \bar{D}) + (\bar{A} \bar{B})$
- c) Draw symbol and write truth table for the following flip flop and give one application of each.
- (i) Clocked R–S flipflop
- (ii) T - Flip flop
- d) Prove  $A(\bar{A} + C)(\bar{A}B + C)(\bar{A}BC + \bar{C}) = 0$
- 3. Attempt any THREE of the following:** **12**
- a) Implement “OR” gate and “NOT” gate using “Universal NAND” gate. Write expressions for both.
- b) Explain following instructions for 8 bit and 16 bit data.
- (i) PUSH
- (ii) DAA
- (iii) IDJV
- (iv) XOR
- c) Draw waves for positive and negative edge triggering with proper lableing. Identify two situations where these triggering can be used?
- d) Simplify  $Y = F(A, B, CD)$   
 $= \Sigma m(1, 2, 8, 9, 10, 12, 13) + d(4,5)$   
 using K-MAP and write expression.

- 4. Attempt any THREE of the following:** **12**
- a) Suggest “Two instruction” for each of the following addressing modes.
- (i) Register Addressing Mode
  - (ii) Direct Addressing Mode
  - (iii) Based Indexed Addressing Mode
  - (iv) Immediate Addressing Mode
- b) Minimize the expression and draw logic circuit using basic gates.  
 $F(A,B,CD) = \pi m \{0, 2, 4, 6, 7, 10, 11, 14, 15\}$
- c) Compare combinational and sequential circuits. Draw block diagram of sequential circuit and describe the function of each block.
- d) (i) Differentiate between RISC and CISC processor (Three point)  
(ii) Compare 8086 and 80586 (Pentium) (3 points)
- e) Draw 16:1 multiplexer using 4:1 multiplexers “ONLY” with proper labels.
- 5. Attempt any TWO of the following:** **12**
- a) Write algorithm and 8086 assembly language program to find average salary of five employees of “SILICON Systems” Assume 4 digit salary of each employee. Also - write output.

- b) Refer Fig. No. 1 and write truth table and output “Y” write expression at output of gates. Redraw the “Fig. No. 1.”

Truth Table				
Inputs				Output
A	B	C	D	Y
O	O	O	O	
⋮	⋮	⋮	⋮	
1	1	1	1	



**Fig. No. 1**

- c) Draw minimum mode configuration of 8086 and explain the function of each block.

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

**12**

- Draw architectural block diagram of 8086 microprocessor and describe the function of each block.
- Design full adder using K-MAP and draw logic circuit using basic gates and write truth table.
- Write an assembly language program to find the largest number from an array of a 10 numbers. Assume suitable data.