

Time: 3 Hrs

Max. Marks: 80

Q. 1. Solve any four Questions out of five

- Perform the following conversion [5]
- A** i) $(7436)_8 = (?)_2 = (?)_{16}$
 ii) $(CODE)_{16} = (?)_{10} = (?)_8$
- B** Write entity declaration constructs in VHDL for AND, OR, NOT and EX-OR gates. [5]
- C** Compare between Static and Dynamic RAM. [5]
- D** Convert S-R flip flop to J-K flip flop. [5]
- E** If $F(A, B, C, D) = \sum m(0, 3, 7, 13, 14, 15) + d(1, 6)$ with its truth - table and express F in SOP form also draw the circuit diagram. [5]

Q. 2. Solve the following

- Implement the following function using, [10]
- A** i) NAND gate ii) NOR gate
- $Y = (A + BC)(B + \bar{C}A)$
 Convert the following into, Octal, Binary, BCD, Excess -3 [10]
- B** i) $(396)_{10}$ ii) $(4096)_{10}$

Q.3. Solve any Two Questions out of Three

- A** Design a Gray- to-Binary code converter [10]
- B** Explain the operation of twisted ring counter with neat diagram [10]
- C** Design full subtractor using half subtractor [10]

Q. 4. Solve the following

- A** Explain Universal Shift register with neat diagram. [10]
- B** Design a BCD – to – Excess 3 code converter using PLA [10]

Q. 5. Solve the following

- A** Draw and explain 4- bit Johnson counter [10]
- B** Draw and explain master-slave J-K Flip Flop with neat diagram and truth table [10]

Q. 6. Solve the following

- A** Define and explain the following terms in case of logic families: [05]
 i) Figure of merit ii) Fan-Out iii) Current and Voltage parameters
 iv) Noise Immunity
- B** Minimize the following logic function [05]
 $F(A, B, C, D) = (AB\bar{C}D + \bar{A}BCD + \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}\bar{D} + A\bar{C} + A\bar{B}C + \bar{B})$
- C** Simplify the following expression using Boolean algebra [05]
 $Y(A, B, C) = \sum m(0, 1, 2, 3, 4, 5, 6, 7)$
- D** Compare Moore and Mealy Machine with neat Diagram [05]
