

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]
- $F(A, B, C, D) = (ABC \bar{D} + \bar{A}BCD + \bar{A}\bar{B}\bar{C} + \bar{A}\bar{B}\bar{D} + A\bar{C} + A\bar{B}C + \bar{B})$
- 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]

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