

Total No. of Questions : 12]

SEAT No. :

P1182

[Total No. of Pages : 2

**[4659] - 78****B.E. (Electrical)****A : VLSI DESIGN****(2008 Pattern) (Elective - III) (Semester - II)***Time : 3 Hours]**[Max. Marks : 100**Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Answer any three questions from each section.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Use of Calculator is allowed.*
- 6) *Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Differentiate between combinational circuit & sequential circuit with one example of each. **[6]**
- b) Draw state transition table, state diagram & implement the hardware circuit diagram for “1111” sequence detector using mealy model. **[10]**

**OR**

- Q2)** a) What do you mean by universal gate? Implement basic gates using universal gates. **[10]**
- b) Implement NAND, NOR, AND gate using 4:1 MUX only. **[6]**
- Q3)** a) What do you mean by Assembly language, Low level language? VHDL is which type of language? Differentiate between any high level language & VHDL. **[8]**
- b) Define the terms & write VHDL code for : **[10]**
- i) Entity
  - ii) Architecture
  - iii) Component
  - iv) Configuration
  - v) Subprogram

***P.T.O.***

**OR**

- Q4)** a) Write VHDL code for  $1 \times 8$  DEMUX & Draw its gate level circuit diagram. [8]  
 b) Draw circuit diagram & timing diagram of MOD 6 synchronous & Asynchronous counter. [10]
- Q5)** a) Write nine different values of standard logic. Also write the syntax in VHDL for  $8 \times 8$  array of Standard logic vector. [8]  
 b) Explain the construction of MOSFET with suitable diagram. [8]

**OR**

- Q6)** a) Explain any four data types & any four data objects used in VHDL. [8]  
 b) State & Explain standard device specifications of MOSFET. [8]

**SECTION - II**

- Q7)** a) Explain configuration with suitable example with VHDL code. [8]  
 b) Give device specifications for typical 54/74 CMOS device. [8]

**OR**

- Q8)** a) Write a note on MOS transistor. [8]  
 b) Define  $V_{OH}$ ,  $V_{IH}$ ,  $V_{IL}$ ,  $V_{OL}$  w.r.t. CMOS. [8]  
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- Q9)** a) Draw the Architecture of PLA & Explain its each block in detail. [8]  
 b) Draw & Explain Architecture of FPGA. [8]

**OR**

- Q10)** a) Write a note on simulation & synthesis. [8]  
 b) Define fan-in, fan-out, FOM, Noise Margin w.r.t. CMOS. [8]

- Q11)** a) Write VHDL code for 4 bit Adder. [8]  
 b) Write code for  $8 \times 8$  RAM & Explain it. [10]

**OR**

- Q12)** a) Draw block diagram of ALU & write its VHDL code. [8]  
 b) Write & Explain VHDL code for 4 bit shift register with parallel load & serial right shift operation. [10]

