

Time: 3 Hours

Marks: 80

- N.B. : (1) Question No 1 is Compulsory.  
 (2) Attempt any three questions out of the remaining five.  
 (3) All questions carry equal marks.  
 (4) Assume suitable data, if required and state it clearly.

**1 Attempt any FOUR**

**[20]**

- a** Convert the following number systems.
  - 1)  $(37.31)_{10}$  to Binary
  - 2)  $(10)_{10}$  to BCD
  - 3)  $(436.71)_8$  into Hexadecimal
- b** Draw and explain 4-bit Carry Look Ahead Adder.
- c** With a neat diagram, explain the working of IC7490 Decade Counter.
- d** Distinguish between PLA and PAL devices.
- e** Write a code in Verilog HDL to implement half adder circuit.

- 2 a** A function is defined as  $F(A, B, C, D) = \sum m(0,1,3,5,7,10,11,13,14,15)$ . Design using single IC 74151. **[10]**

- b** Explain the working of IC7485 with the help of a function table. Draw a neat diagram of an 8-bit comparator using two IC7485. **[10]**

- 3 a** With a neat block diagram, explain the working of 74138 Decoder IC. Design 4:16 decoder using two 74138 ICs. **[10]**

- b** With a neat diagram, explain the working of IC74194. Design it as a Ring Counter. **[10]**

- 4 a** Design a Non-Overlapping Mealy Sequence Detector for sequence 1101. **[10]**

- b** With suitable examples, explain Weighted Codes and Hamming codes. **[10]**

- 5 a** Write a short note on CPLD Devices. How are they different from FPGA Devices? **[10]**

- b** Draw the circuits of NAND and NOR Gates using CMOS devices. Explain the working of each. **[10]**

- 6 a** Write a code in Verilog HDL to implement 4-bit Up-down counter. **[10]**

- b** Design IC74163 to count from binary equivalents of 4 to 15. **[10]**

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