Code No.: R22EC305ES   R22   H.T.No. [ ][ ][8][R][ ][ ][ ][ ][ ]

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–I–Semester End Examinations (Supply) - June- 2025
DIGITAL LOGIC DESIGN
(CSD)

[Time: 3 Hours]   [Max. Marks: 60]

Note: This question paper contains two parts A and B.
  Part A is compulsory which carries 10 marks. Answer all questions in Part A.
  Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A   (10 Marks)

1. a) What are the basic properties of Boolean algebra?   [1M]
   b) Convert $(AB)_{16}$ = ( )$_2$.   [1M]
   c) State the limitations of Karnaugh map.   [1M]
   d) What are called don't care conditions?   [1M]
   e) Define Encoder.   [1M]
   f) What do you mean by comparator?   [1M]
   g) What are the classifications of sequential circuits?   [1M]
   h) What is race-around condition?   [1M]
   i) What are the types of ROM.   [1M]
   j) What are identifiers?   [1M]

PART-B   (50 Marks)

2. Perform the subtraction on the given unsigned binary numbers using the 2's [10M]
   complement:
   (i) 1001-110101   (ii) 101000-10101

                                    OR

3. State and prove Associate law and Distributive law using logic gate and truth table. [10M]

4. Simplify the Boolean function using K-map in products of sums form: [10M]
   F(w, x,y,z)=Σm(2,3,10,11,12,13,14,15).

                                    OR

5. Explain NAND-NOR implementations and design the circuit by Using NAND gates [10M]
   F= (X+Y). (X'+Y'+Z')

6. Draw the logic diagram of full subtractor and explain its operation.   [10M]

                                    OR

7. Using 8 to 1 multiplexer, realize the Boolean function   [10M]
   T = f(w, x, y, z) = Σm(0,1,2,4,5,7,8,9,12,13).

8. Explain the principle of RS Flip-flop with the help of a logic diagram and truth table. [10M]

                                    OR

9. Explain the operation of a 4-bit universal shift register with D flip-flops. [10M]

10. What is ROM? Explain the different types of ROM's in detail.   [10M]

                                    OR

11. Define HDL and explain various HDL models for combinational circuits.   [10M]

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