Code No.: DS305ES | R20 | H.T.No. | | | 8 | R | | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–I–Semester End Examinations (Supply) - February- 2024
DIGITAL LOGIC DESIGN
(CSD)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 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 **(20 Marks)**

1. a)	Convert $(145.96)_{10}$ to hexadecimal numbers.	[2M]
b)	Define a minterm and a maxterm.	[2M]
c)	Identify any two fundamental postulates of Boolean Algebra.	[2M]
d)	Realize the NAND gate using NOT gate.	[2M]
e)	What is Comparator and deduce the truth table of 1-bit comparator.	[2M]
f)	Outline any two applications of encoder and decoder.	[2M]
g)	What is latch and filp-flop.	[2M]
h)	Differentiate synchronous and asynchronous counters.	[2M]
i)	Give the comparison between ROM and PLA.	[2M]
j)	Explain RAM briefly.	[2M]

PART-B **(50 Marks)**

2. Represent decimal number 8620 in i) BCD, ii) Excess-3 code, iii) Binary number and iv). Grey code. [10M]

OR

3. Perform the subtraction with the following unsigned binary numbers by taking the 1's complement of the subtrahend. [5M]
   a) 11110 – 10000 [5M]
   b) 11010 – 1100

4. Minimize the following expression using K-map and realize using NAND gates. [10M]
$$F(A,B,C,D,E) = \prod(6,9,11,13,14,17,20,25,28,29,30)$$

OR

5. Simplify the following function and implement with NAND gates [10M]
F=Σm(0,1,3,4,5,7,9,11,13,15).

6. Construct a 4-bit binary adder using full-adders to perform binary addition between two 4-bit numbers. [10M]

OR

7. Design 3:8 decoder and explain operation with truth table. [10M]

8. Implement a 3-bit Ring Counter circuit using D-Flip Flops. [10M]

OR

9. Illustrate the operation of clocked SR Flip-Flop with the help of truth table. [10M]

10. Implement the following functions using PROM: F1=Σm(0,1,3,5,7); F2=Σm(0,4,3,6,7). [10M]

OR

11. Classify different PROMS and explain in detail. [10M]

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