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Code No.: R22EC303PC | R22 | H.T.No. | | | 8 | R | | | | | | |

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

[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 2's complement and 9's complement of a numbers? Give examples. [1M]
   b) Solve for x? $(257)_8 = (x)_2$. [1M]
   c) Define pair quad and octet in K-Maps and give examples. [1M]
   d) Write a short note of Tristate TTL. [1M]
   e) What is a Decoder and Encoder? [1M]
   f) What is the difference between Latch and Flip-flop? [1M]
   g) Define a Register? [1M]
   h) Write a truth table of JK-Flip-flops. [1M]
   i) What is a Merger graph? [1M]
   j) Define a Finite State Machines. [1M]

PART-B **(50 Marks)**

2. Explain various number systems and codes and their conversion with examples for each. [10M]

OR

3. Simplify $F(A,B,C,D) = \sum (4,5,6,7,12,13,14) + d(1,9,11,15)$ using K-map. [10M]

4. Simplify the following Boolean expressions to a minimum number of literals. [10M]
   i)ABC+A'B+ABC' (ii) xy + x(wz+wz')

OR

5. Discuss about RTL logic family in detail, with one example. [10M]

6. What is an Encoder? Design an Octal to Binary Encoder. [10M]

OR

7. Explain the conversion of SR flip flop into JK and D flip flop with an excitation table. [10M]

8. With a neat diagram, Explain the operation of Bidirectional Shift registers? [10M]

OR

9. Design a Mod-6 Synchronous counter using JK Flip flops. [10M]

10. Write difference between Mealy and Moore machines. [10M]

OR

11. What are the capabilities and limitations of Finite state machines? Explain. [10M]

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