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**SIR C.R.REDDY COLLEGE OF ENGINEERING, ELURU**

**FIRST YEAR ENGINEERING DEPARTMENT**

**GRAND TEST**

**Course: I/IV B.E/B.Tech A.Y 2021-22**

**Branch:AI&DS DATE:21/07/2022**

**SUBJECT:DLD SUB CODE:R201221**

***(Answer all the questions)***

1. a) Implement the following Boolean functions with a PROM:

A(x,y,z)=Ʃ(1,2,4,6); B(x,y,z)=Ʃ(0,1,6,7); C(x,y,z)=Ʃ(2,6); D(x,y,z)=Ʃ(1,2,3,5,7).

b) Implement a Boolean function. F(x,y,z)=∑(2,4,6) with a multiplexer.

(or)

2. a) A combinational circuit is defined by the functions:

F1(A,B,C)= Ʃ(3,5,6,7); F2(A,B,C)= Ʃ(0,2,4,7)

Implement the circuit with PLA.

b) Design a priority encoder of 4-bit.

3. a) Design a JK flip flop using AND gates and NOR gates. Explain the operation of the JK flip flop with the help of characteristic table and characteristic equation. Explain the Race around condition and also explain how to eliminate it.

b) Draw the logic diagram of D-flip flop and explain.

(or)

4. a) Explain the terms Preset and Clear in connection with a flip-flop.

b) Implement RS-latch using NAND and NOR gates. Explain its operation.

5. a) Design a counter with the following repeated binary sequence: 0, 1, 2, 3, 4, 5, 6. Use JK flip-flops. Treat the un-used states as don’t-care conditions.

b) The content of a 4-bit register is initially 1101. The register is shifted six times to the right with the serial input being 101101. What is the content of the register after each shift?

(or)

6. a) Draw the circuit diagram of 4-bit ring counter using d-flip flop and explain its operation.

b) Design a mod 12 counter using T flip-flops