

Time : Three Hours]

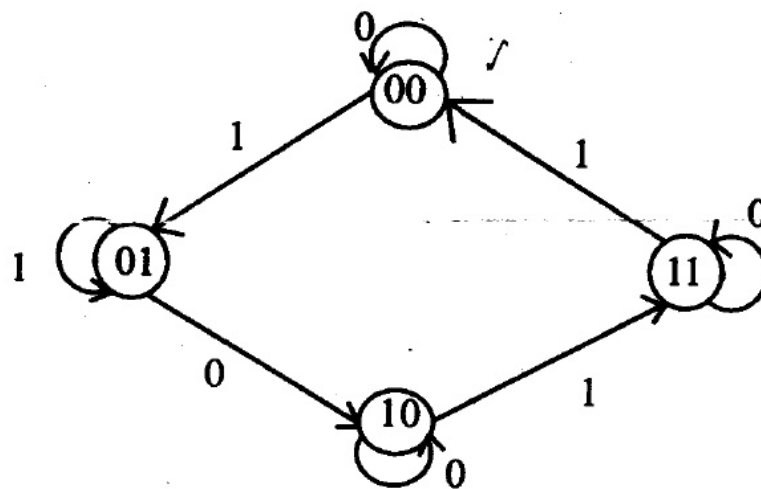
[Maximum Marks : 100

Note:- Attempt any FIVE questions.

1. (a) Prove that an AND-OR configuration is equivalent to a NAND-NAND configuration. 5
 (b) What is Gray Code ? What are its applications ? How will you convert a binary no. into Gray code ? 5
 (c) Minimize the equation :

$$f(A, B, C, D) = \sum m(1, 3, 7, 11, 15) + d(0, 2, 5).$$
 10
2. (a) Simplify the equation using Quine-McCluskey method :

$$Y(A, B, C, D) = \sum m(0, 1, 3, 7, 8, 9, 11, 15)$$
 10
 (b) Design a 2-decade BCD-to-binary converter. 10
3. (a) Discuss Master-Slave Flip flop with neat diagram. 5
 (b) Design a divide by 6 counter. 7½
 (c) Design a 3 bit synchronous counter using J-K Flip-flop. 7½
4. (a) For the state diagram shown below, obtain the state table and design the circuit using minimum no. of J.K flip-flops. 10



- (b) Realize a 4 variable truth table using 8:1 multiplexer. 10
5. (a) Define the following terms :
- (i) Fan in
 - (ii) Figure of merit
 - (iii) Speed of operation
 - (iv) Noise immunity
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- (v) Fan out. 10
- (b) Describe CMOS logic family in detail with their properties. 10
6. (a) Design R-2R ladder D/A converter.
- (b) Explain sample and hold circuit.
- (c) Explain specifications of A/D converters.
- (d) Explain parallel-comparator A/D converter. $5 \times 4 = 20$
7. (a) Draw block diagram of PLA and explain. 10
- (b) What is PLA ? Discuss its applications also. 10
8. Write short notes on any two :
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- (a) Bipolar Logic Families
- (b) Synchronous Ring Counter
- (c) Dual Slope ADC. $10 \times 2 =$