

Con. 6602-13.

LJ-10598

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No.1 is **compulsory**.
 (2) Attempt any **four** out of remaining **six** questions.
 (3) **Figures to right** indicate **full** marks.
 (4) Assume **suitable data** if **required**.

1. Answer the following :— 20
- (a) (i) Obtain the XS-3code for $(428)_{10}$
 (ii) Convert 1110 Gray to Binary.
 (b) Define (i) Propagation Delay Time.
 (ii) Fan-In and Fan -Out.
 (c) Perform XS-03 addition $(27)_{10} + (38)_{10}$
 (d) Prove De-Morgan's theorem.
 (e) Compare TTL and ECL Logic Family.
2. (a) Minimize the following expression and realize using basic gates. 10
 $Y = \sum m (1, 2, 3, 5, 7, 8, 9, 11).$
 (b) Obtain minimal expression using Quine Mc-Cluskey method. 10
 $f(A,B,C,D)=\sum m(1,5,6,12,13,14) +(2,4)$
3. (a) Design and implement 3-bit synchronous up-counter using J-K flip flop. 10
 (b) Implement the following expression using 3 data select i/p multiplexer. 10
 $f(A, B ,C, D)= \sum m (0,1,2,3,4,10,11,14,15)$
4. (a) (i) Convert SR flip-flop to JK flip-flop. 10
 (ii) Convert JK flip-flop to T flip-flop.
 (b) Show that : (i) $(A+ \bar{A}B) (A+AB) (A+C) =A$ 10
 (ii) $AB+ \bar{A}C=AB+ \bar{A}C+BC$
5. (a) Implement BCD to Excess 3 Converter. 10
 (b) Design and Implement an even parity generator for 4- bit input. 10
6. (a) Draw functional block diagram of IC 723 and explain its operation. 10
 (b) Draw and explain monostable multivibrator IC 555. 10
7. Write short notes on – (Any **three**) :— 20
- (a) Hamming Codes.
 (b) Master-slave JK flip-flop.
 (c) ADC 0808.
 (d) ECL logic family.