

Con. 5076-07.

(REVISED COURSE)

CD-6750

(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 the **right** indicate **full marks**.  
 (4) Assume **suitable** data if **required**.

1. Explain :- 20
  - (a) TTL, CMOS, ECL Logic Families.
  - (b) Encoder and Decoder.
  - (c) Laws of Boolean Algebra.
  - (d) 8 : 1 Multiplexer.
  
2. (a) Design and implement a BCD to 7 segment decoder for common Cathode 10  
 configurations.  
 (b) Design X-OR and X-NOR gates using all universal gates. 10
  
3. (a) Implement the following using all 4 : 1 mux : 12
  - (i)  $F(A, B, C) = \pi(0, 1, 4, 5, 7)$
  - (ii)  $F(P, Q, R, S) = \Sigma m(1, 2, 6, 7, 9, 11, 13, 15)$
- (b) Using Two's complement method subtract : 4  
 $(47)_8$  from  $(47)_{10}$ .
- (c) State the rules for BCD subtraction : 4  
 $Z = (54)_{10} - (39)_{10}$ , find Z.
  
4. (a) Draw the block diagram of BCD adder using IC 7483. 12  
 (b) What is reflective code ? Give any one example of a reflective code. 4  
 (c) Convert the decimal number 67 to BCD and to 7421 code. 4
  
5. (a) Design JK flip-flop using SR flip-flop. 8  
 (b) Design 3 bit asynchronous Up-Down counter. 12
  
6. (a) Using Quine Mc-Cluskey method, simplify the following equation : 10  
 $F(A, B, C, D, E) = \Sigma m(1, 2, 6, 8, 10, 11, 14, 15, 16, 17, 20, 21, 24, 30)$   
 (b) Simplify  $F(0, 1, 2, 3, 8, 9, 12, 13, 14)$  using K-map. Realize CKT using basic gates 10  
 and universal gates.
  
7. (a) Draw Twisted Ring Counter and explain . 10  
 (b) Simplify : 10
  - (i)  $F = A + \bar{B} \bar{D} + D \bar{C} \bar{A} + AC$
  - (ii)  $Y = \overline{AD + \bar{C}D \cdot BD + \bar{C}D}$