

Time : Three Hours]

[Maximum Marks : 100

Note :- Attempt **FIVE** questions in all taking at least **ONE** question from each unit.

UNIT-I

1. (a) Determine 1 bit, 2 bit, 3 bit Gray code and tabulate alongwith their equivalent decimal numbers. 7
 - (b) Represent decimal number 4096 in BCD code, Binary code, Excess-3 code, Octal code, Hexadecimal code. 7
 - (c) Prove $\frac{B \oplus (B \oplus A.C) = A.C}{A \oplus B = A \oplus \bar{B} = \bar{A} \oplus B}$ 6
 2. Simplify the following expression and realize using NAND/NOR gates : 20
- $f_1(A, B, C, D, E, F) = \prod M(6, 9, 13, 18, 19, 25, 27, 29, 41, 45, 57, 61)$

UNIT-II

3. Design BCD to 7 segment decoder CKT. 20
4. (a) Explain the operation of a twisted-ring counter and give its state diagram. 12
- (b) Describe Master Slave J-K Flip Flop. 8

UNIT-III

5. (a) Explain the operation of CMOS NOR gate. 10
- (b) Compare the performance of TTL and CMOS families. 10

- | | | |
|----|--|----|
| 6. | (a) Describe the characteristics of Digital ICs. | 12 |
| | (b) Explain Resistor-Transistor Logic CKT. (RTL) | 8 |

UNIT-IV

- | | | |
|----|--|---------|
| 7. | (a) Write a short note on S/H CKT. | 8 |
| | (b) Describe dual slope ADC with suitable diagram. | 12 |
| 8. | Write short notes on :- | |
| | (a) FPGA | |
| | (b) CPLD. | 10×2=20 |