BT-4/M09 9315

Digital Electronics

Paper : ECE-204 E

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 $\frac{B \oplus (B \oplus A.C) = A.C}{A \oplus B = A \oplus \overline{B} = \overline{A} \oplus B}$ 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