

Roll No. ....

Total No. of Pages : 2

**BT-4/JX**

**8315**

**Digital Electronics (New)**

**Paper : ECE-204 E**

Time : Three Hours]

[Maximum Marks : 100

**Note :— Attempt any FIVE questions.**

1. (a) Give five examples each of analog and digital systems. 5
- (b) Complement and simplify following :—
  - (i)  $\bar{A} B$
  - (ii)  $(\bar{A} + B)(\bar{C} \bar{D})$ .
  - (iii)  $(A + \bar{A}B)(C + \bar{D})$ . 5
- (c) Explain Excess-3 and Gray codes. 5
- (d) Find the standard product of sum form
  - (i)  $AB + \bar{A}C\bar{D}E + \bar{B}CD$ .
  - (ii)  $AB\bar{C}D + BC\bar{E} + AD$ . 5
2. Use minimum number of
  - (a) NAND gates
  - (b) NOR gates to synthesize the following :
    - (i)  $f = \Sigma m(0, 1, 2, 3, 8, 9, 10, 11)$
    - (ii)  $f = \Pi M(5, 7, 13, 15)$ . 20
3. (a) Draw a Mod-3 counter and explain it with the help of gates and waveforms. 10
- (b) What are positive and negative edge triggered flip flops and explain
  - (i) negative edge triggered J-K flip flop
  - (ii) +ve edge triggered D-type FF. 10

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(Contd.)

4. Design a four flip flop shift counter. Explain it with help of diagram, truth table and waveforms. If there is malfunction due to illegal states then cure it. 20
5. (a) Suppose you need a TTL device with a power dissipation of less than 5 mW per gate and a delay time of less than 20 ns. What TTL type will you choose and why? 12  
(b) Explain the characteristics of ECL family in detail. 8
6. (a) Explain why the temperature sensitivity of HTL is significantly better than that of DTL. 10  
(b) Write a note on Tri-state logic. 10
7. Write notes on :—  
(i) FPGA.  
(ii) Dual-slope ADC. 10×2=20
8. (a) Explain the Basic design principle of Successive-Approximation of A/D converter with the help of an example. 12  
(b) Explain the specifications of D/A converters. 8