

Roll No.

Total Pages : 3

BT-4/M-13

8406-R

DIGITAL ELECTRONICS (New)

Paper-ECE-204-E

Time Allowed : 3 Hours]

[Maximum Marks : 100

Note : Attempt five questions in all, selecting at least one question from each Unit. All questions carry equal marks.

UNIT-I

1. (a) Starting from the logical equation $F = (A + BC)(B + \bar{C}A)$ minimize the function in POS and SOP forms and realize it with NAND and NOR gates respectively. 10
- (b) What do you mean by the Gray code? What are its applications? 5
- (c) What are the advantages and disadvantages of the Q-M method vis-a-vis the K-map? 5
2. (a) If register A holds $(257)_{10}$, register B holds $(1050)_{10}$ and register C holds their Sum, show the contents of register A, B and C in: (i) Binary form, (ii) BCD form, (iii) Hex. code. 10
- (b) Simplify the Boolean function using K-map $F(w, x, y, z) = \Sigma(1, 3, 7, 11, 15)$ and don't care conditions $d(w, x, y, z) = \Sigma(0, 2, 5)$. 10

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UNIT-II

3. (a) Describe the operations performed by the following logic circuits: (i) Decoder, (ii) Encoder. 10
- (b) Draw the logic diagram and timing diagram of a 3-bit binary ripple-up counter and down counter using positive-edge triggered FFs. 10
4. (a) Carry out a method to convert a D flip-flop to a J-K flip-flop. 10
- (b) Explain the operation of a 4-bit bidirectional shift register with the help of a circuit diagram. 10

UNIT-III

5. (a) Sketch a 2-input ECL gate and explain its operation. 10
- (b) Compare the following Technologies: Bipolar and CMOS! 10
6. (a) What are the merits and demerits of the TTL family? 10
- (b) How do open-collector outputs differ from totem-pole outputs? 10

UNIT-IV

7. (a) Define the following parameters of DACs:
 - (i) Resolution
 - (ii) Accuracy

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- (iii) Monotonicity
- (iv) Settling time
- (v) Offset voltage. 10
- (b) Write short note on D/A converting. 10
- 8. (a) Give the principle of Counter type A/D converter. 10
- (b) Write short note on Read only Memories. 10