

Roll No.

Total No. of Pages : 2

Total No. of Questions : 09

B.Tech (CSE/IT) (Sem.-3)
DIGITAL CIRCUITS & LOGIC DESIGN
Subject Code : CS-205
Paper ID : [A0453]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY.
2. Attempt any FOUR questions from SECTION-B.
3. Attempt any TWO questions from SECTION-C.

SECTION-A (10 × 2 = 20 Marks)

1. Write short notes on :

- (a) Convert $(10110111)_2$ to decimal equivalent.
- (b) Convert the following BCD number to its decimal equivalent.
10011000.01000101
- (c) Realize NAND gate with the help of NOR gates only.
- (d) What are the advantages of CMOS memory chips over bipolar memory chips?
- (e) What is multiplexer? Explain with the help of an example.
- (f) How sequential circuits are different from the combinational circuits?
- (g) What is the function of multivibrator?
- (h) What is resolution in A/D converter?
- (i) What is shift register?
- (j) Why do we use PGAs?

SECTION-B (4 × 5 = 20 Marks)

2. Minimize the following Boolean expression.

$$Y = (\overline{ABC} + A\overline{BC})(\overline{A}BC + A\overline{BC})$$

3. Design full subtractor using demultiplexer.
4. Design mod-8 down asynchronous counter using T flip-flops.
5. Draw and explain the circuit of TTL NAND gate with open collector.
6. State and prove De-Morgan's theorems.

SECTION-C (2 × 10 = 20 Marks)

7. Write short notes on following :
- (a) Successive approximation A to D Conversion Technique
- (b) Multivibrators
8. Differentiate between custom and semi-custom VLSI design.
9. What is race-around condition? How it is eliminated in Master-Slave J- K flip-flop ?