

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (CSE / IT) (Sem.-3rd)

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** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students has to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students has to attempt any **TWO** questions.

SECTION-A

1. Answer briefly :

- (a) Why one need to know variety of codes, whereas digital machine/ circuit understands, only binary code ?
- (b) How negative numbers are represented?
- (c) What should be best option for the unused inputs in a 4 input NAND gate when only two inputs are to be used ?
- (d) What do you mean by line termination ?
- (e) What are the important parameters which need to be considered while converting Analog to Digital ?
- (f) What are the important features of any memory system ?
- (g) How many select lines are required for 14 to 1 MUX ?
- (h) List the advantages of MOS over TTL logic family.
- (i) How many transistors can be integrated in a typical VLSI chip ? Mention the chip size also.
- (j) List the applications of ASCII code.

SECTION-B

2. Mention the varieties of ROM's. Compare their relative advantages and disadvantages.
3. Simplify the Boolean function :
$$f(A, B, C, D) = \Sigma (0, 2, 3, 5, 6, 7, 8, 9)$$
 with 10, 11, 12, 13, 14, 15 as don't cares.
4. Draw the circuit of a 4-bit shift register and explain its operation.
5. Draw the circuit of a CMOS-NOR gate and explain its truth table.
6. Calculate the conversion time of a ten-bit digital ramp A/D convertor and a ten bit successive approximation A/D convertor, when the clock frequency used by them is 1000 KHz.

SECTION-C

7. (a) Draw the circuit of a successive approximation A/D convertor and explain its operation.
(b) Discuss R-2R Ladder D/A convertor.
8. (a) Explain the difference between combinational and sequential circuits.
(b) Draw the circuit of a MOS-Static RAM cell and explain its working.
(c) Draw the circuit of a Bistable Multivibrator and explain its working.
9. (a) Draw the circuit of a tristate NOT gate and explain its working.
(b) Draw the circuit of a 3 input TTL NAND gate with totempole output and explain its truth table.