

Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (ECE) (Sem.-6)

**VLSI DESIGN**

Subject Code : BTEC-604

M.Code : 71124

Date of Examination : 12-07-22

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 have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Answer briefly :**

- a) What is architecture body? Give example.
- b) What are the design units in VHDL? Name them.
- c) What are deferred constants?
- d) Differentiate between sequential statements and concurrent statements by giving an appropriate example.
- e) Explain the formal estimation of CMOS Inverter delay.
- f) Why NMOS technology is preferred more than PMOS technology?
- g) What is propagation delay?
- h) What is the cause of delay in CMOS inverter?
- i) Describe the different scaling models and scaling factors.
- j) What is rise-time estimation?

## SECTION-B

2. List the various scalar data types and explain them with examples.
3. Design  $8 \times 1$  MUX using two 4:1 MUX and one 2:1 MUX along with its diagram. Implement  $8 \times 1$  multiplexer in VHDL using structural modelling style.
4. Define Threshold Voltage. Express threshold voltage and discuss dependency of  $V_T$  on various parameters.
5. Explain the concept of driving large capacitive loads with relevant examples.
6. Explain the static and dynamic power dissipation in CMOS circuits with necessary diagrams and expressions.

## SECTION-C

7. Write a VHDL code for 4-bit Binary to Gray code converter using behavioral style of modeling.
8. Sketch the cross section and explain the operation of  $n$ -channel enhancement type MOS transistor. Draw the characteristics of the device.
9. Discuss about the effects of scaling down the dimensions of MOS circuits and systems.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**