B.TECH.
(SEM VII) THEORY EXAMINATION 2022-23
VLSI DESIGN

Time: 3 Hours   *Total Marks: 100*

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.**   **2x10 = 20**

    (a) Define the term worst case timing analysis.
    (b) State the term delay.
    (c) Define the term lumped circuit.
    (d) What is a transient response in any circuit?
    (e) What is a dynamic circuit?
    (f) Differentiate between Combinational and Sequential circuits.
    (g) What is a volatile memory?
    (h) Define the term Power consumption.
    (i) Define the term faults.
    (j) What is the term controllability?

SECTION B

2. **Attempt any *three* of the following:**   **10x3 = 30**

    (a) Describe different propagation delays in VLSI Design.
    (b) Explain Skin effect and its related functions used in VLSI Design.
    (c) What is charge sharing VLSI? Define the solution to avoid or lessen charge sharing in any circuit.
    (d) Elaborate the pipeline architecture.
    (e) Define the term functional modeling in VLSI circuits.

SECTION C

3. **Attempt any *one* part of the following:**   **10x1 = 10**

    (a) Describe different packaging techniques used in VLSI Circuits.
    (b) Elaborate general VLSI design flow by describing each block separately.

4. **Attempt any *one* part of the following:**   **10 x1 = 10**

    (a) Describe the term Logical effort and calculate the logical effort of a path.
    (b) Explain the distributed R-C model.

5. **Attempt any *one* part of the following:**   **10x1 = 10**

    (a) Describe the working and application of two-phase clocking systems.
    (b) Elaborate the working and applications np-CMOS logic.

6.   **Attempt any *one* part of the following:**   10x1 = 10

   (a)   Explain the working and applications of a Flash memory cell.

   (b)   Illustrate different types of RAM cells.

7.   **Attempt any *one* part of the following:**   10x1 = 10

   (a)   Describe different faults defined in any VLSI circuits.

   (b)   Explain the Built-in-Self-Test technique for testing a VLSI Circuit.