

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including question No. 1 which is compulsory and selecting two questions from each Unit.

- I. Attempt the following:- x-x-x
- What is a pass transistor? What are its applications? Compare it with a transmission gate.
 - List four CAD tools used in VLSI design.
 - Differentiate between placement and routing in VLSI layout.
 - Differentiate between an RS flip flop and a toggle flip flop.
 - What are ratioed circuits? What are their applications? (5x2)

UNIT – I

- In an NMOSFET, explain the weak, moderate and strong inversion regions. Explain the linear and saturation regions of IV characteristics of a p type MOSFET. (10)
- Differentiate between a CMOS inverter and a MOS inverter with active load. What is an active resistor? Draw transfer characteristics of a CMOS inverter. (10)
- Explain the working of NOR and NAND logic gates using a MOSFET. Also explain the design steps of such logic gates. Compare these gates with the Bi-CMOS NOR and NAND gates. (10)

UNIT – II

- Explain how a VLSI digital circuit can be described using a language? Explain the salient features and types of such a language. (10)
- Explain and compare the terms placement and floor planning. What are their types? Name two of the algorithms of placement and floor planning. (10)
- Write notes on:-
 - Power line distribution in a VLSI layout
 - Types of routing in a VLSI layout. (5,5)