

VLSI Design

Time : Three Hours

Maximum Marks : 70

Note: Attempt only one question from each unit. Each question carries equal marks

UNIT – I

1. a) Explain the operation of n-channel enhancement MOSFET with different values of Gate voltage.
- b) What do you mean by hybrid technology? Describe the thick film and thin film circuits.

OR

2. a) Explain the following terms:-
 - i) Oxidation
 - ii) Lithography
 - iii) Ion-Implantation
 - iv) Epitaxy
- b) Discuss about the Bipolar process in detail.

UNIT – II

3. a) Draw and explain small-signal MOSFET model.
- b) Explain short channel devices. Also mention its applications, advantages and limitations.

OR

4. a) Explain the dc model for (i) Diode (ii) BJT
- b) Explain the method for measurement of λ and K.

UNIT-III

5. a) Explain the simulation of a circuit using SPICE with suitable flowchart.
- b) Compare the high-frequency model of BJT and MOSFET.

OR

6. a) Explain the level I large signal MOSFET model.
- b) Explain noise model for MOSFET as well as BJT.

UNIT-IV

- a) Explain and differentiate the random logic forms and structured logic forms.
- 14 Describe the Bit-serial processing elements in details.

OR

8. a) Discuss the working of a static register cell.
- b) What is ALU? Explain its architecture with detail.

UNIT- V

9. a) Discuss the steps of n-well CMOS fabrication process with suitable diagram.
- b) Explain the following terms with respect to latch up:
 - i) Physical origin
 - ii) Latch-up prevention

OR

10. a) Explain the basic steps for the fabrication process flow
- b) What are the circuit elements? Describe the various types of circuit elements in detail.