Time: 3 Hours

Max.Marks: 60

Instructions: Each Unit carries 12 marks.
Answer all units choosing one question from each unit.
All parts of the unit must be answered in one place only.
Figures in the right hand margin indicate marks allotted.

UNIT-I

1. With neat sketches discuss about
   a) p-well process  b) n-well process  c) Twin-tub process  12
   OR

2. a) Write short notes on:
   i) Enhance mode transistor action
   ii) Depletion mode transistor action  6
   b) Write short notes on BiCMOS technology  6

UNIT-II

3. Derive the equations for $I_{ds}$ in non-saturated and saturated region  12
   OR

4. Discuss about
   a) CMOS inverter  b) BiCMOS inverter  12

UNIT-III

5. a) Explain in detail about CMOS design style  6
   b) Explain Lambda based design rules  6
6. Draw stick diagram and layout for a 2-input nMOS NOR gate

UNIT-IV

7. Write short notes on:
   a) Propagation delays in cascaded pass transistors
   b) Wiring capacitances

OR

8. Explain in detail about limitations of scaling

UNIT-V

9. Explain in detail about structural design of four line gray code converter with mask layout

OR

10. Explain in detail about behavioral description, structural and physical description of an incrementer/decrementor