2063
B.E. (Electronics and Communication Engineering)
Fifth Semester
EC-501: VLSI Design

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt _five_ questions in all, including Question No. I which is compulsory
and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

a) What are the factors that have led to the evolution and enhancement of VLSI
Integrated Circuits?

b) Give the brief idea of dynamic power loss in CMOS.

c) Why threshold voltage is important in MOSFET.

d) Give the importance of lambda based design rules.

e) Explain the short channel effect in brief.   (5x2)

UNIT - I

II.   Explain in detail, the Chemical Vapour Deposition in monolithic IC process. (10)

III.   What is Ion-implantation? Why ion-implantation is preferred over diffusion for
impurity doping? Explain briefly ion-implantation technique.   (10)

IV.   Explain the CMOS n-well process in detail.   (10)

UNIT - II

V.   a) Explain the I-V and transfer characteristics of enhancement and depletion mode
MOSFET.

b) Explain the concept of static power dissipation in CMOS circuits.   (2x5)

VI.   Explain the Clocked CMOS and Conventional CMOS logic families.   (10)

VII. Derive and analyze the expression for rise time, fall time & propagation delay (high
to low) in CMOS inverter.   (10)

x-x-x