Roll No. ..... **Total Pages : 02**

BT-7/M-20 **37008**

VLSI DESIGN

ECE-401-E

Time : Three Hours] [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) Draw the stick diagram and layout for CMOS Inverter.

(b) Explain the electrical properties of MOS transistor in detail.

2. Describe the equation for source to drain current in the three regions of operation of a MOS transistor and draw the VI characteristics.

Unit II

3. (a) Explain the need of scaling, scaling principles and fundamental units of CMOS inverter.

(b) Draw the static CMOS logic circuit for the following expression :

(i) Y = (A.B.C.D)'

(ii) Y = (D(A + BC))'.

4. (a) Design a logic function block diagram of 8 : 1 multiplexer.

(b) What are the different algorithms used in various VLSI problem solving ?

Unit III

5. What is purpose of floor planning ? Explain different types of floor plans.

6. Write a short note on routing procedures involved in FPGA interconnect.

Unit IV

7. What is zero stack model ? Explain with example.

8. Explain the following :

(a) Timing driven placement

(b) Timing driven routing.