

VLSI SYSTEM DESIGN LAB(ECE3001)

(BY PROF.JAGANNADHA NAIDU K)

TASK-3

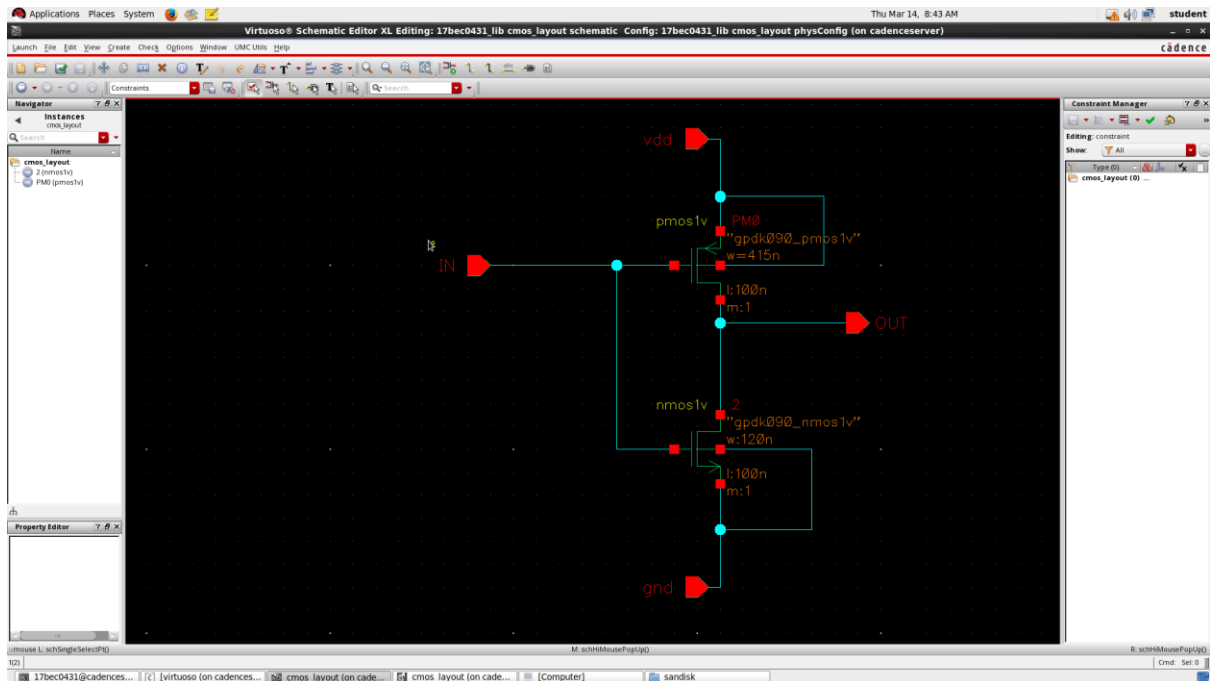
SLOT-L23+L24

NAME:SIDDHANT AGARWAL

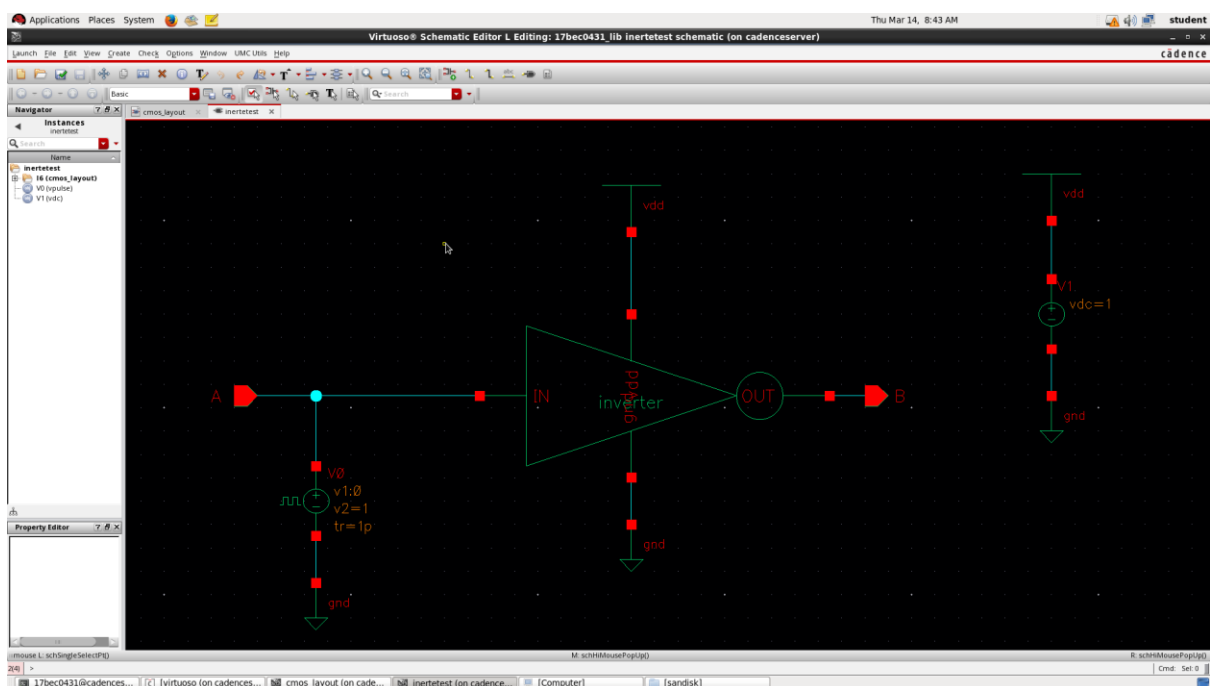
REGISTER NO:-17BEC0431

AIM: TO use cadence virtuoso to make CMOS inverter layout and transient analysis.

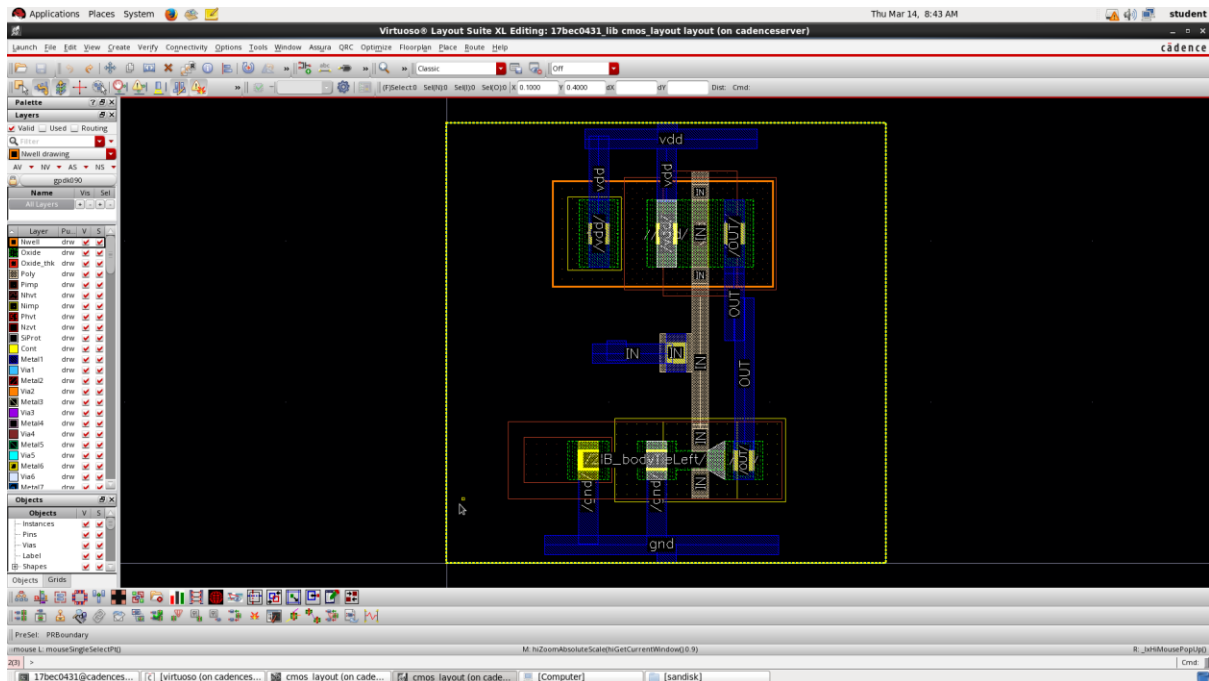
SCHEMATIC :-



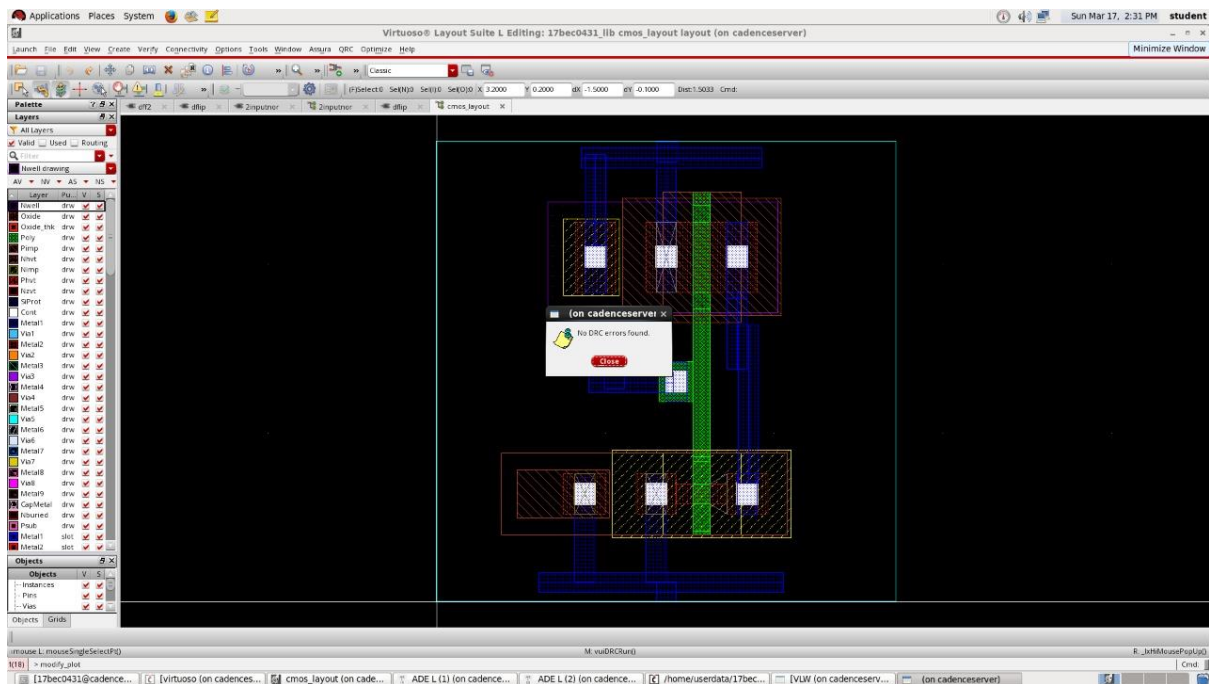
SYMBOL LAYOUT TEST



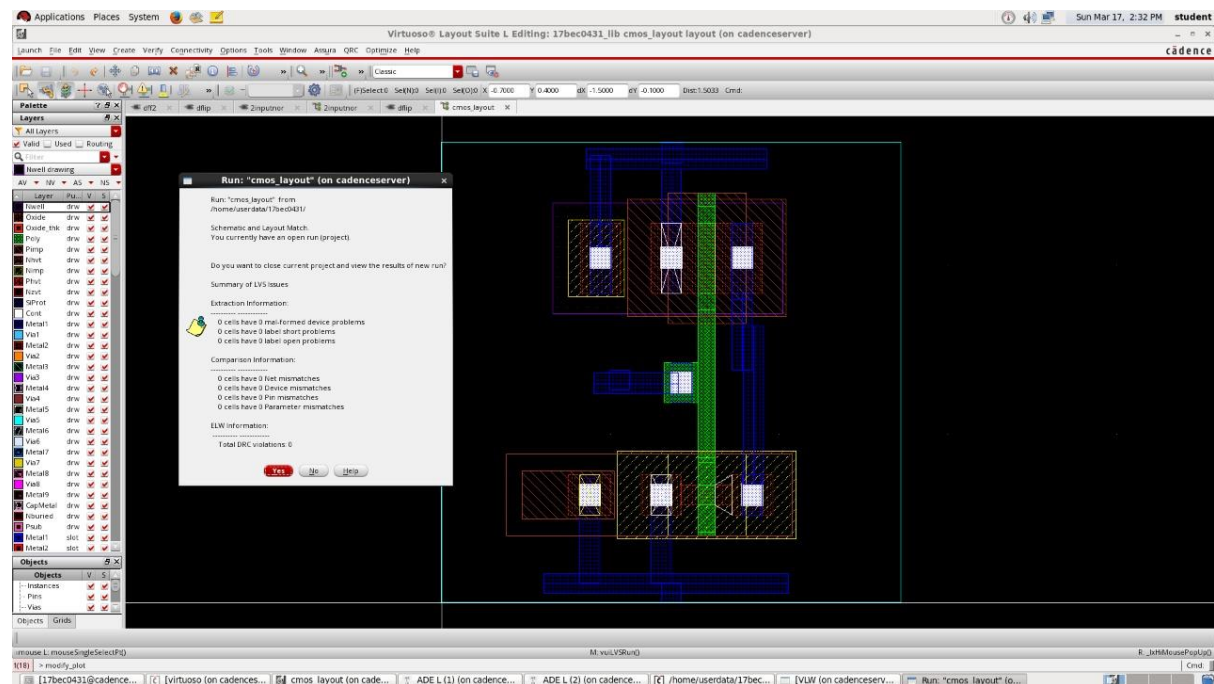
Inverter LAYOUT



OUTPUT VERIFICATION



LVS RUN



GRAPHICAL OBSERVATION

FOR SCHEMATIC



The screenshot displays the Virtuoso (R) Visual & Analysis XL interface. The top window shows the 'Transient Response' plot for the dataset 'tran-tran'. The plot displays three signals over a time range from 0.0 to 100.0 ns:

- Top Plot (V1):** A red square wave signal representing voltage, labeled 'V(V)'. The y-axis ranges from -0.4 to 1.6 V. The signal alternates between approximately 1.2 V and -0.2 V.
- Middle Plot (V2):** A green square wave signal representing voltage, labeled 'V(V)'. The y-axis ranges from -0.1 to 1.1 V. The signal alternates between approximately 0.9 V and -0.1 V.
- Bottom Plot (W1):** A red square wave signal representing power, labeled 'W (uW)'. The y-axis ranges from -10.0 to 180.0 uW. The signal alternates between approximately 150 uW and -10 uW.

The x-axis for all plots is 'Time (ns)' ranging from 0.0 to 100.0. The interface includes a top menu bar (File, Edit, View, Graph, Axis, Trace, Marker, Measurements, Tools, Window, Browser, Help) and a toolbar with various analysis and plotting tools. The bottom status bar shows the current trace and dataset information.

AV EXTRACTED POWER ANALYSIS



OBSERVATION

Delay calculation(schematic):-

$$T_{pHl} = 3.1 \times 10^{-12} \text{ s}$$

$$T_{pLh} = 3.9 \times 10^{-12} \text{ s}$$

$$\text{Delay} = (t_{pLh} + t_{pHl}) / 2 = 3.5 \text{ ps}$$

Delay calculation(avextracted)

$$T_{pHl} = 8.9 \times 10^{-12} \text{ s}$$

$$T_{pLh} = 5.3 \times 10^{-12} \text{ s}$$

$$\text{Delay} = (t_{pLh} + t_{pHl}) / 2 = 7.1 \text{ ps}$$

POWER:-

At Schematic:- 138.6nW

At avextracted:- 169.3nW

RESULT

At Schematic:-

Delay=($t_{plh}+t_{phl}$)/2 =3.5ps

POWER:- 138.6Nw

At avextracted:-

Delay=($t_{plh}+t_{phl}$)/2 =7.1ps

POWER:- 169.3nW