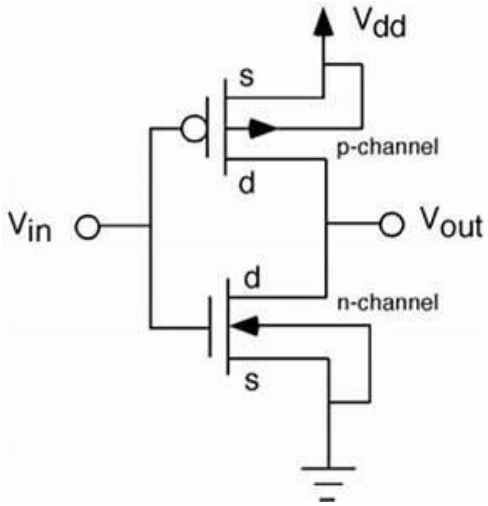
EXPT NO: 10 CMOS INVERTER LAYOUT DATE:

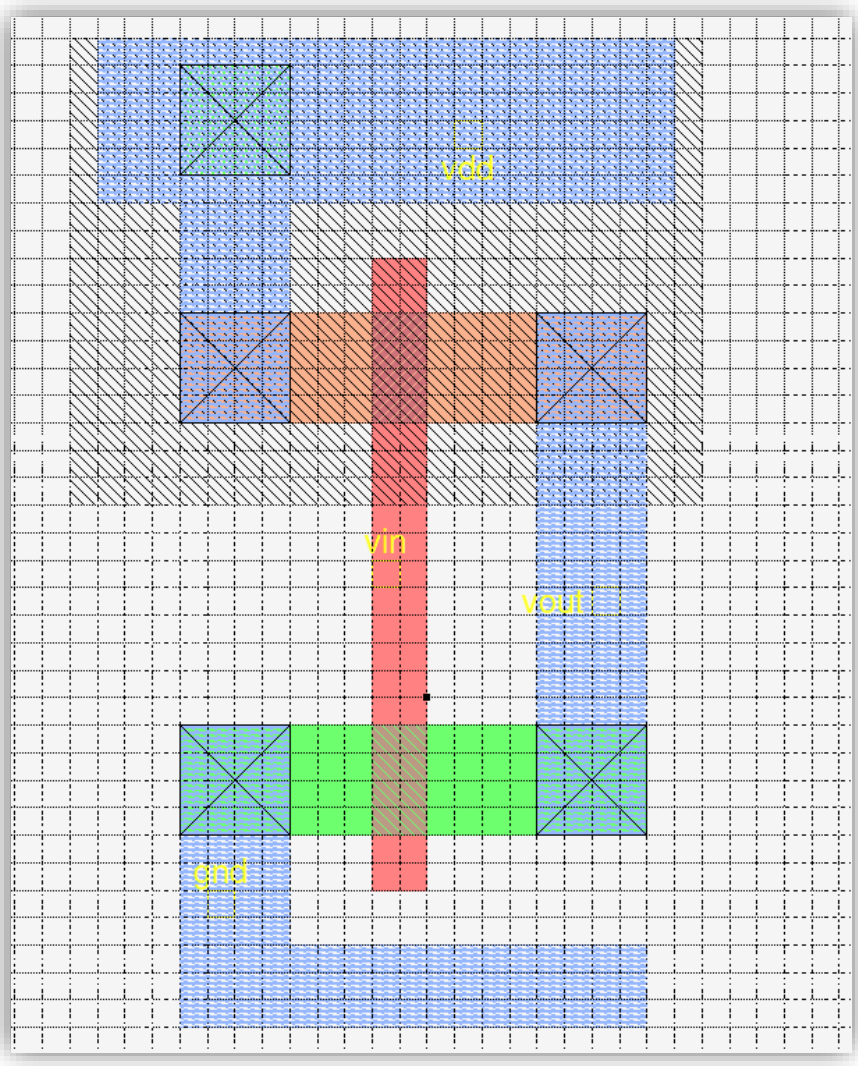
AIM: To draw the LAYOUT of CMOS Inverter in MAGIC, extract the parameters in SPICE and verify the functionality.

SOFTWARE REQUIRED: Ubuntu 10.1, NGSPICE, MAGIC

DIAGRAM:



CMOS INVERTER Layout in MAGIC:



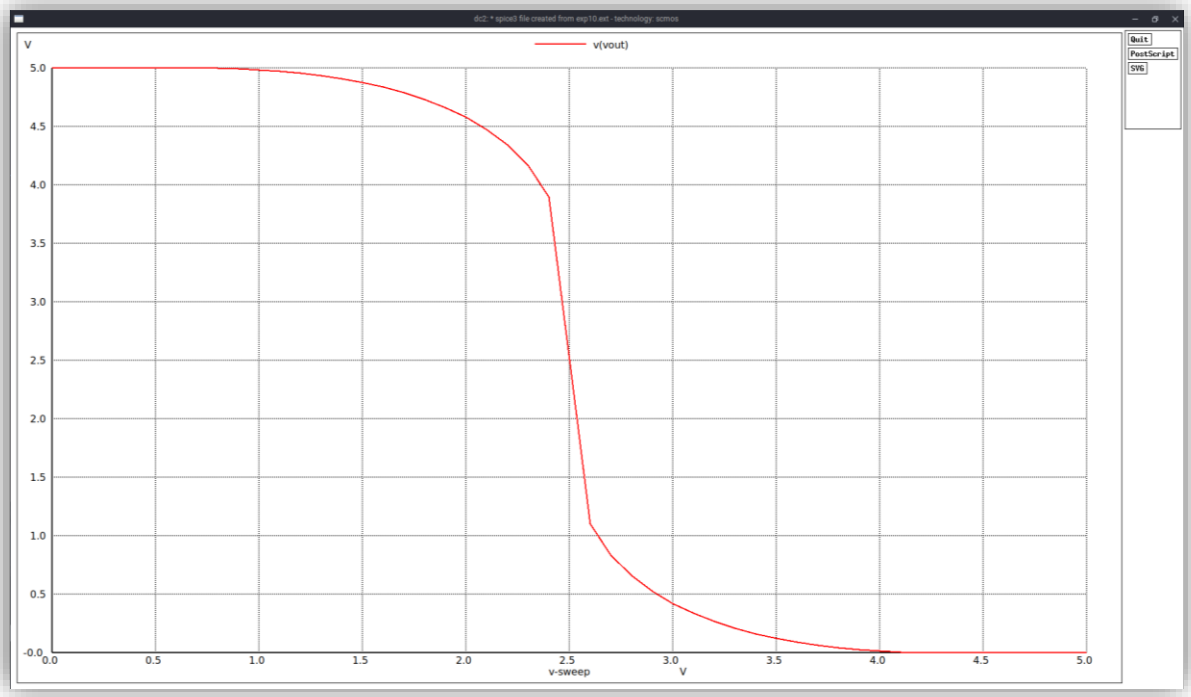
SPICE CODE FOR CMOS INVERTER :

Open ▾ aca.spice ~/Desktop Save

```
* SPICE3 file created from aca.ext - technology: scmos

.option scale=1u

M1000 Vout vin vdd vdd pfet w=4 l=2
+  ad=32 pd=24 as=32 ps=24
M1001 Vout vin gnd Gnd nfet w=4 l=2
+  ad=32 pd=24 as=32 ps=24
C0 gnd Gnd 4.89fF
C1 vin Gnd 4.05fF

Vsupply vdd 0 5
vin1 vin 0 5
Vdummy gnd! 0 0
.model nfet nmos(kn=20u vto=0.7 lambda=0.01 gamma=0.001)
.model pfet pmos(kp=20u vto=-0.7 lambda=0.01 gamma=0.001)
.dc vin1 0 5 0.1
.control
run
plot v(Vout)
.endc
.end
```

Plain Text ▾ Tab Width: 8 ▾ Ln 22, Col 1 ▾ INS

OUTPUT: CMOS INVERTER CHARACTERISTICS :



CONCLUSION: The LAYOUT was successfully drawn, parameters extracted in SPICE and the characteristics of CMOS Inverter were verified.