<Expt. No. 1a - MOSFET device and CMOS inverter characterization using HSPICE	
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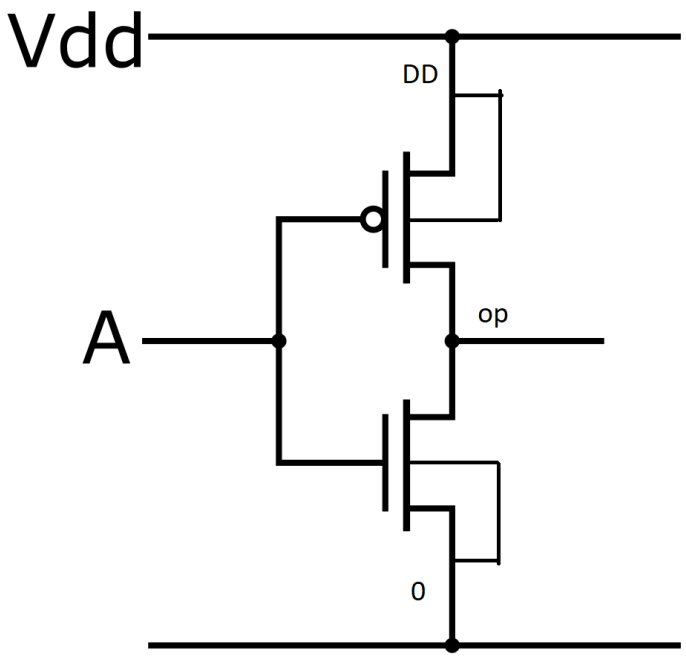
ROLL No.: CB.EN.P2VLD21016	**Marks :** **out of 10**

AIM:

To obtain MOSFET device and CMOS inverter characterization using HSPICE

BLOCK/CIRCUIT DIAGRAM:



CODE:

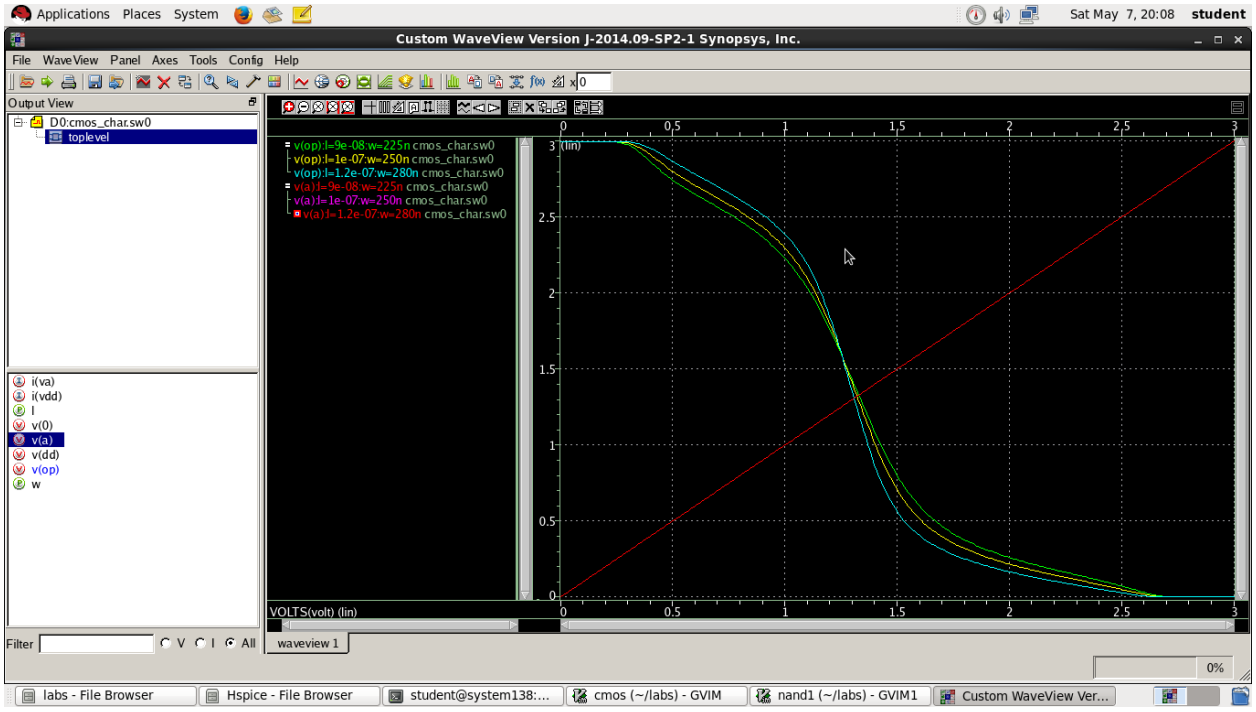
```
*CMOS Characteristics
.MODEL PCH PMOS LEVEL=54
.MODEL NCH NMOS LEVEL=54
MPA op A DD DD PCH L=L W=W
MNA op A 0 0 NCH L=L W=W

vdd DD 0 3
va A 0 3

.DATA d1
L        W
90n      225n
100n     250n
120n     280n
.ENDDATA

.DC va 0 3 0.01 SWEEP DATA=d1
.plot DC V(A) V(op)
.option post
.end
```

OUTPUT:



INFERENCE:

- Analyzed the CMOS inverter characteristics using Hspice tool
- Modeled the devices only by designing netlist for the operation with level 54 devices
- Assigned node names for the MOSFET devices and provided input and analyzed the output characteristics
- Manually written the netlist for the devices, so schematic is not required
- Since node names were assigned, connections can be easily monitored
- Analyzed the output characteristics of the CMOS inverter device with three different W and L values keeping the W/L ratio as 2.5 for all W, L values respectively