MOSFET with Capacitor: 3, 7, 11, 15, 19, 23, 25-30
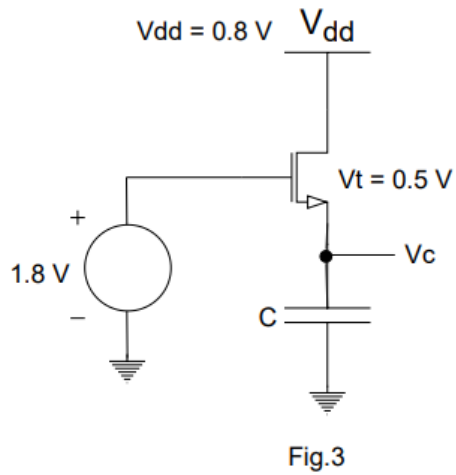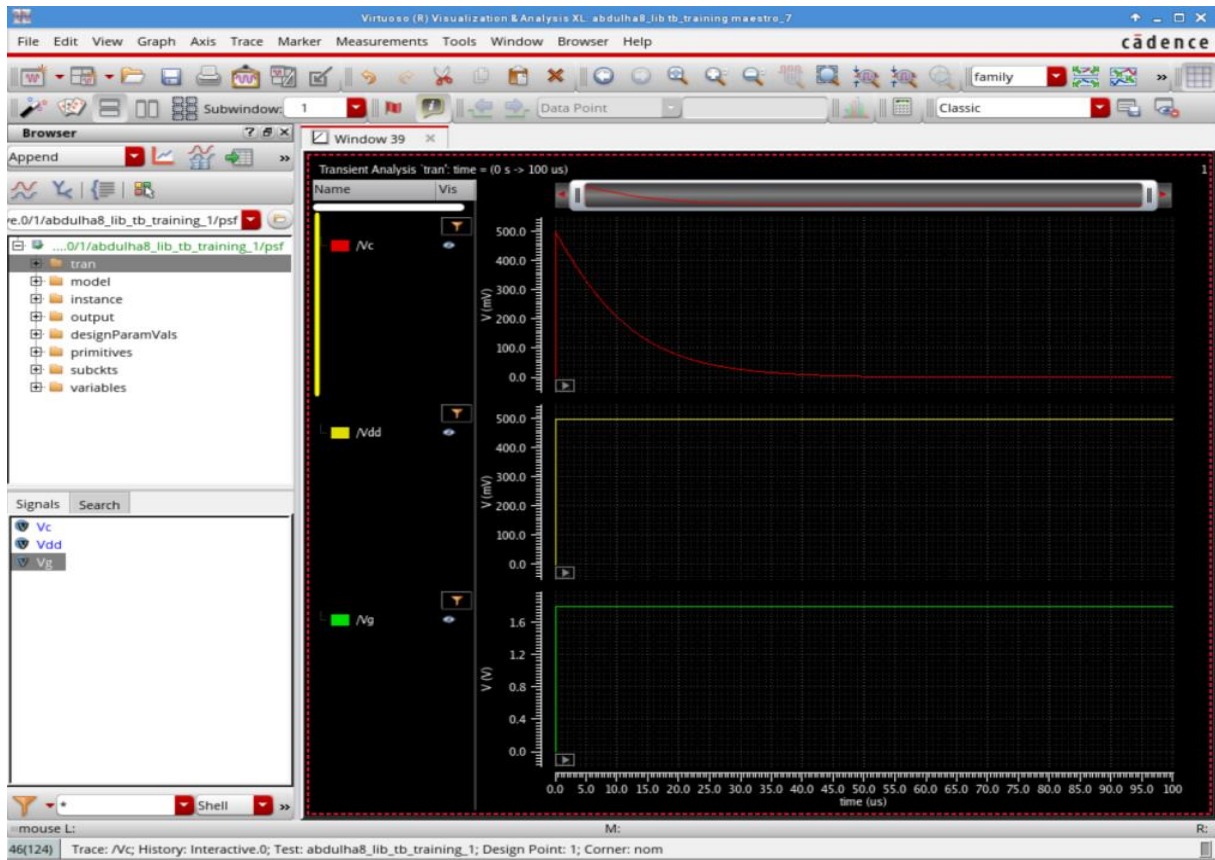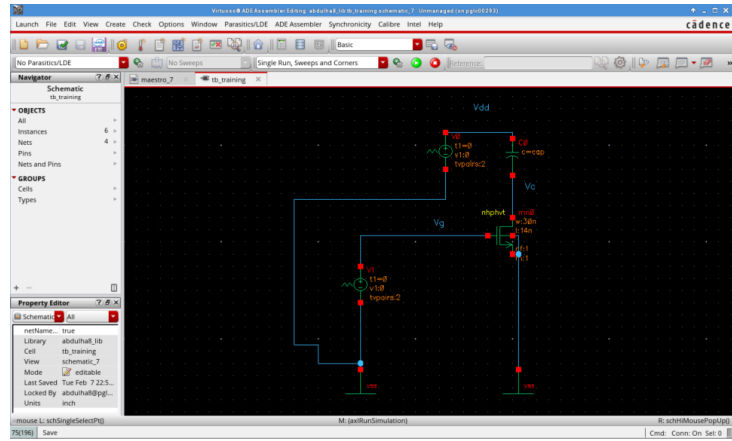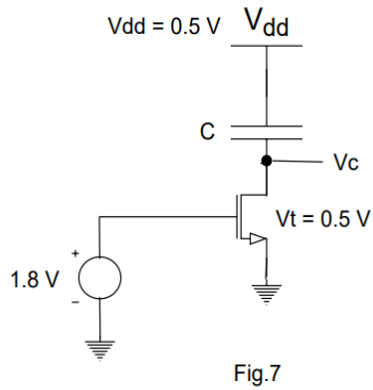


Fig.3
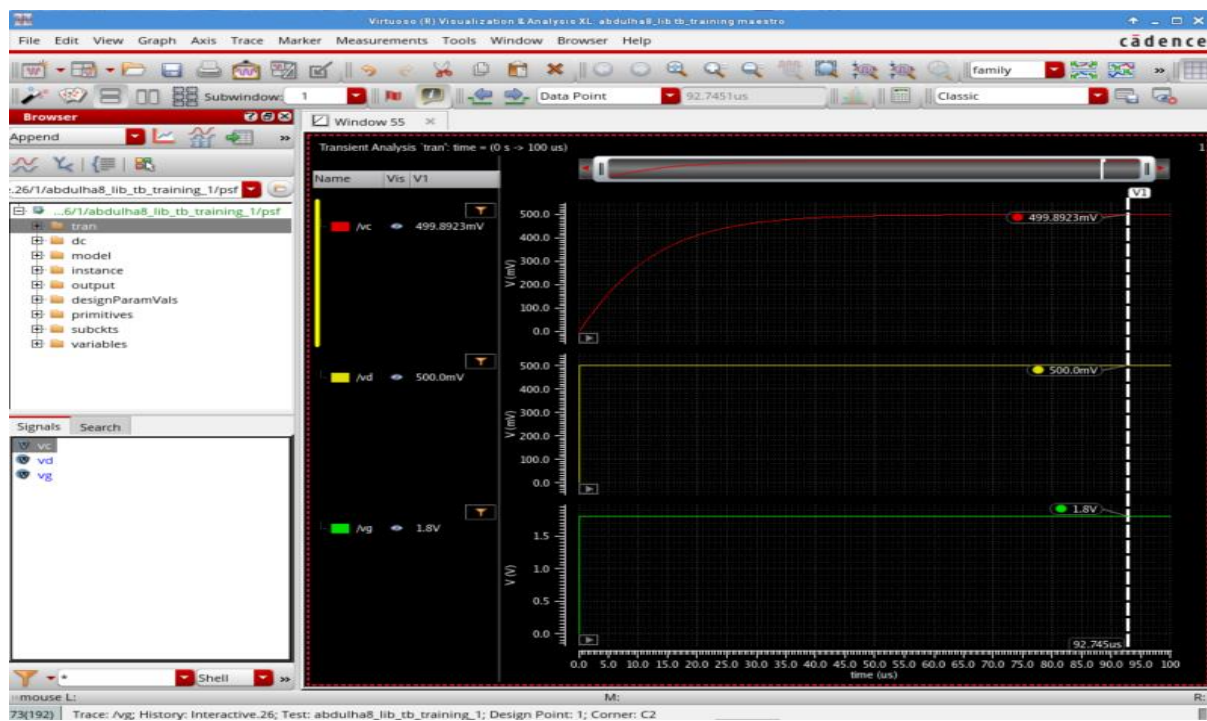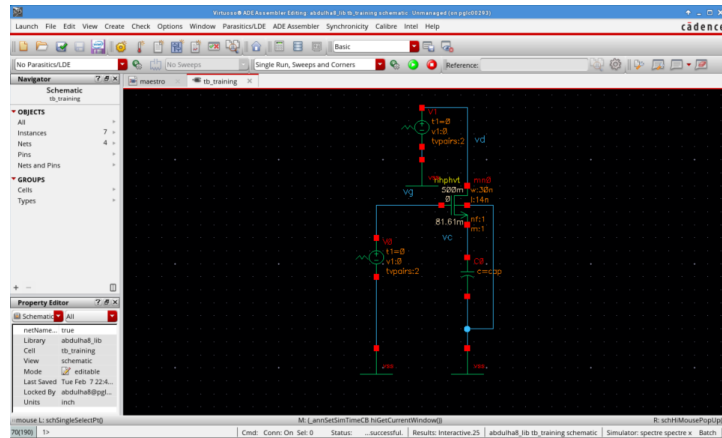


Cap= 5nF

Q-7: Initially capacitor C is discharged. Find the value of Vc at steady state. Draw the waveform of Vc vs Time.



Vdd = 0.5 V

C

Vc

Vt = 0.5 V

1.8 V

Fig.7



Cap= 5nF

Q-11: Initially capacitor C is charged to 1.8 V. Find the value of Vc at steady state. Draw the waveform of Vc vs Time.
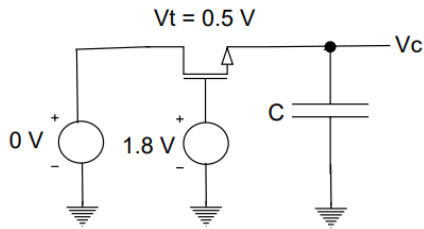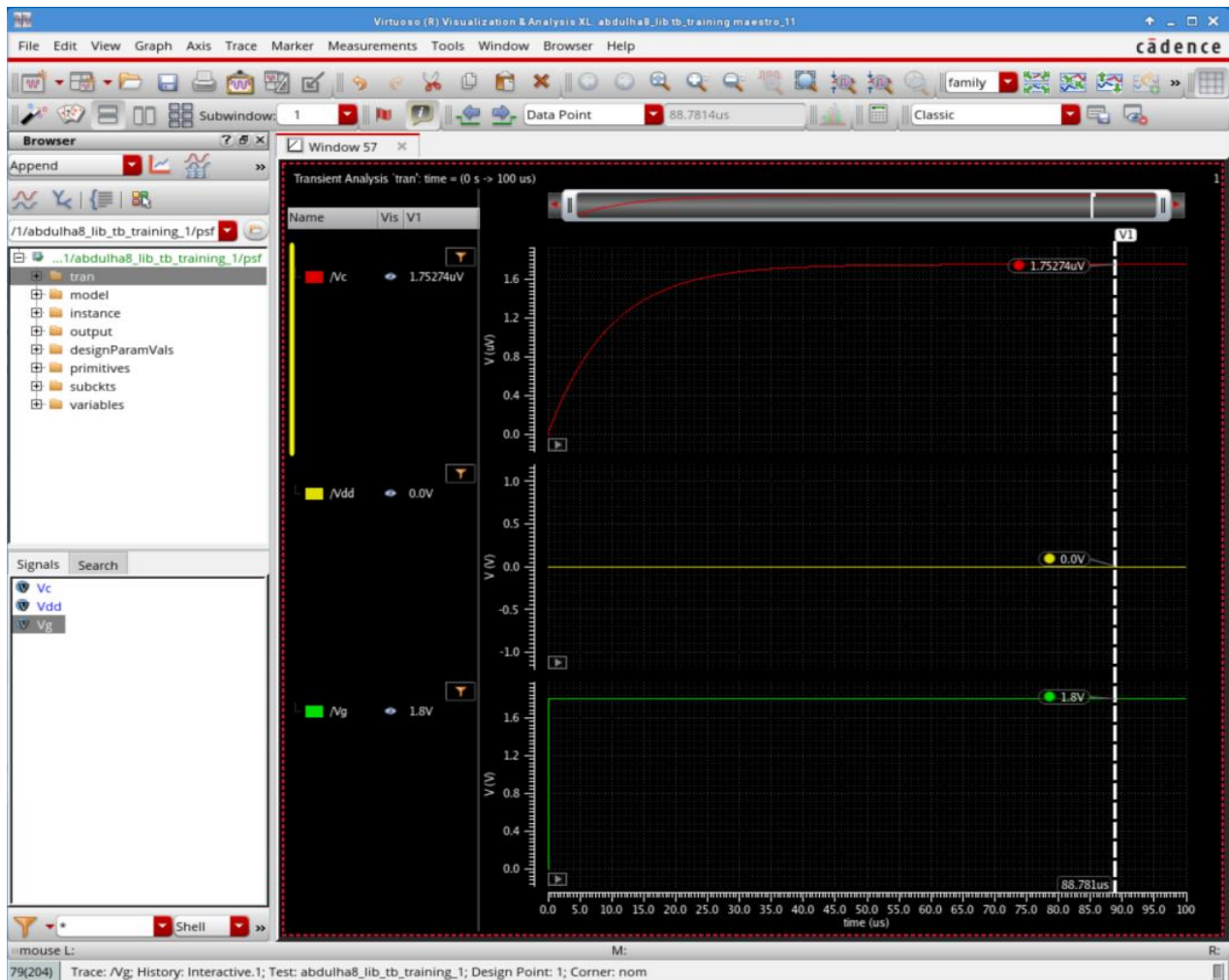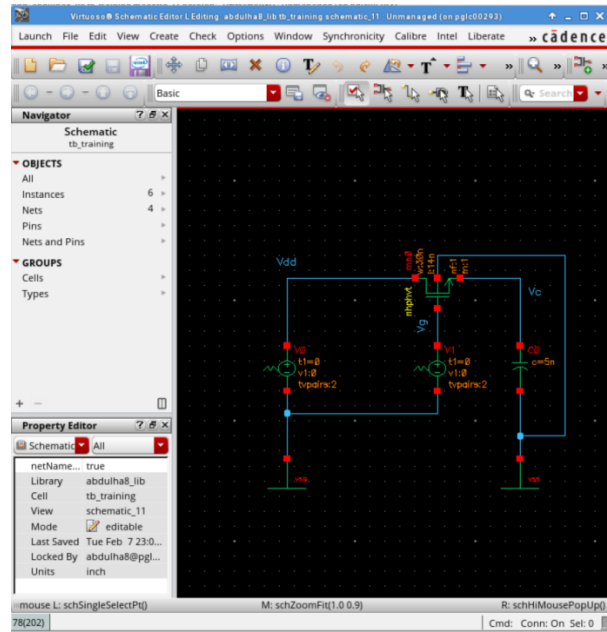


Fig.11

**Q-15:** Initially capacitor C is discharged. Find the value of Vc at steady state. Draw the waveform of Vc vs Time.
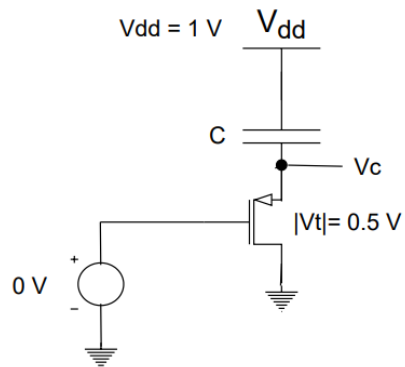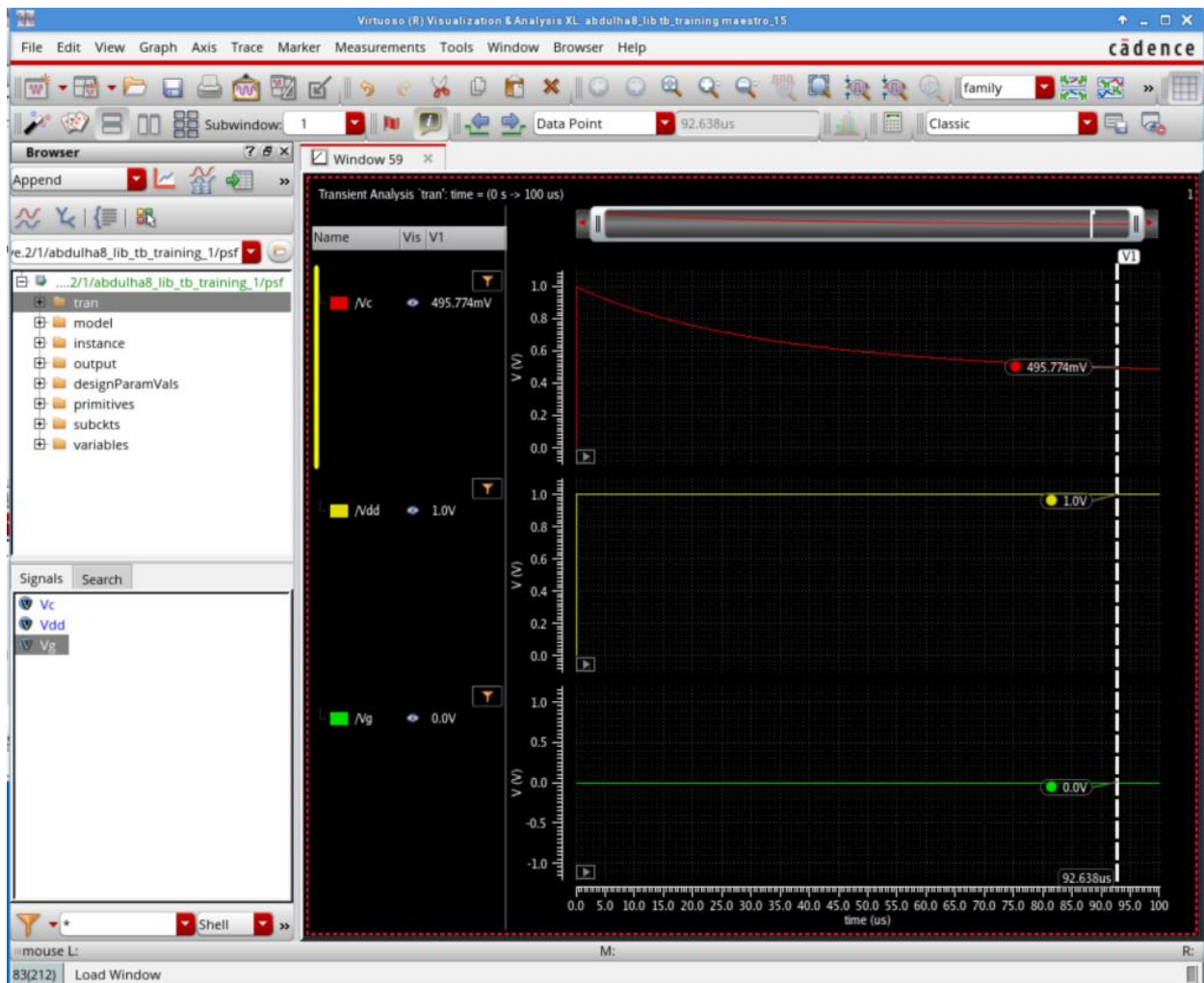


Vdd = 1 V

$V_{dd}$

C

Vc

$|V_t| = 0.5$ V

0 V

+

−
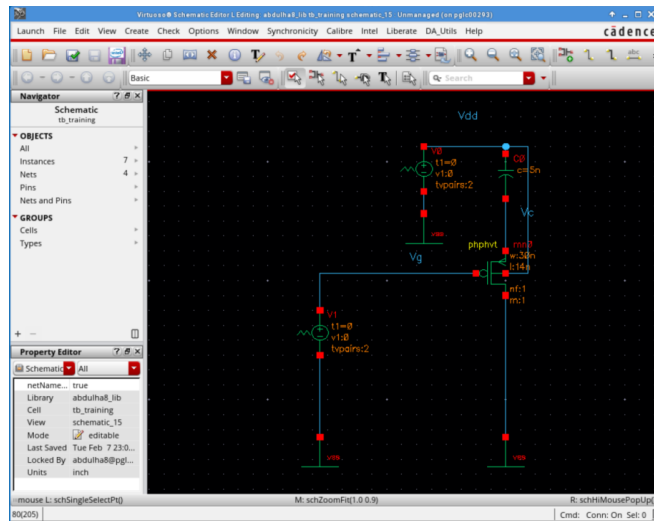
Fig.15

Q-19: Initially capacitor C is discharged. Find the value of Vc at steady state. Draw the waveform of Vc vs Time.

Vdd = 1.8 V

$V_{dd}$

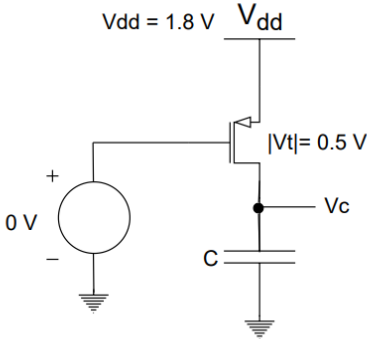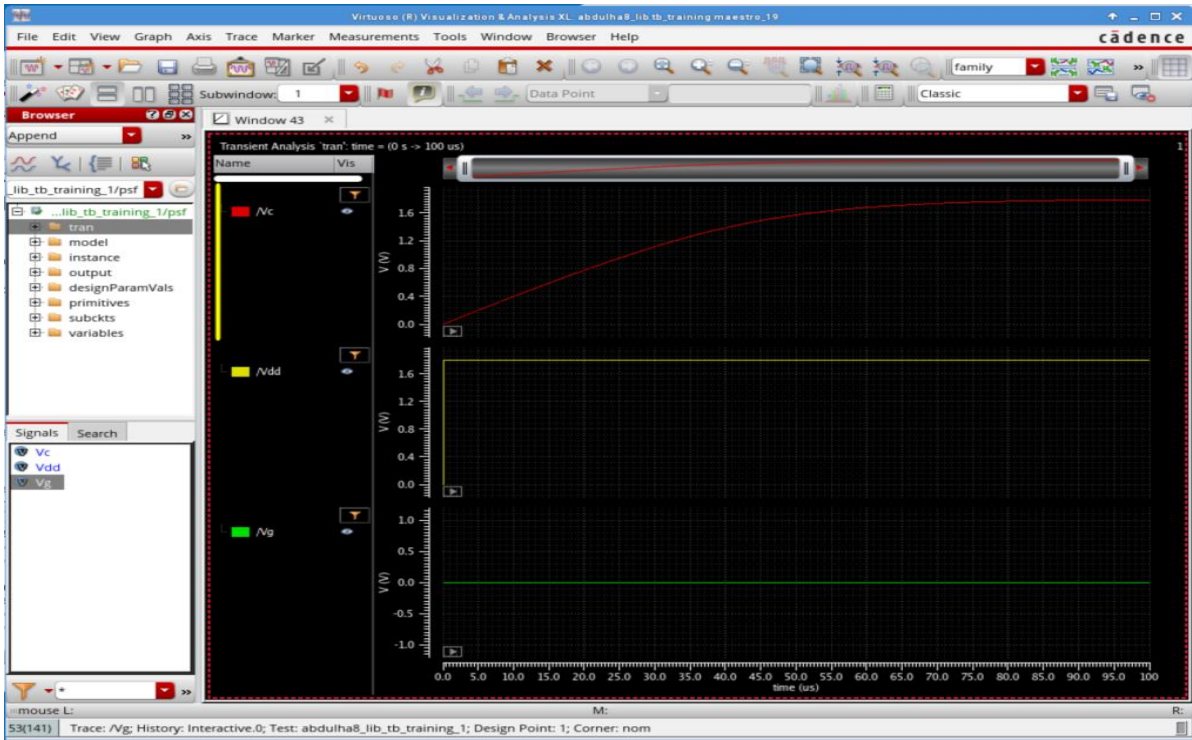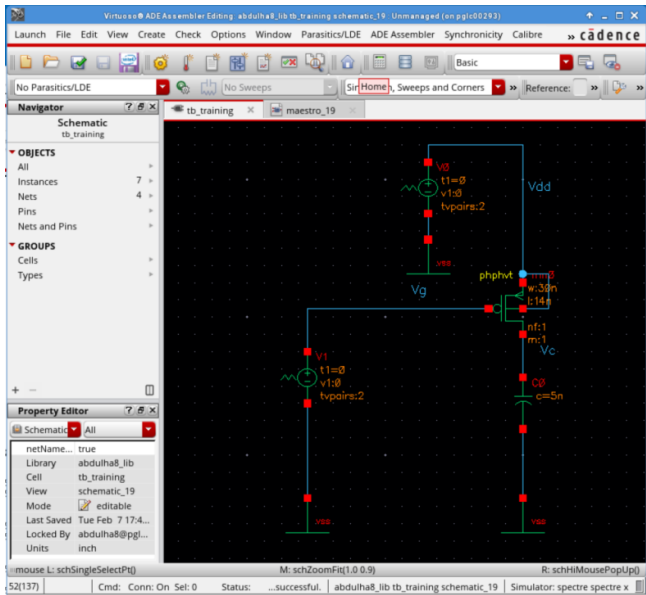$|Vt| = 0.5$ V

0 V

+

−

Vc

C

Fig.19

**Q-23:** Initially capacitor C is charged to 1.8 V. Find the value of Vc at steady state. Draw the waveform of Vc vs Time. Assume for PMOS higher potential terminal is source
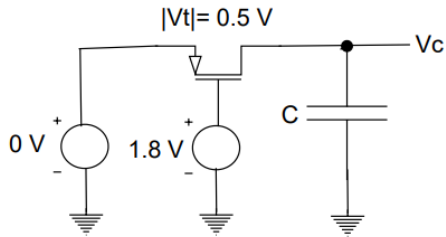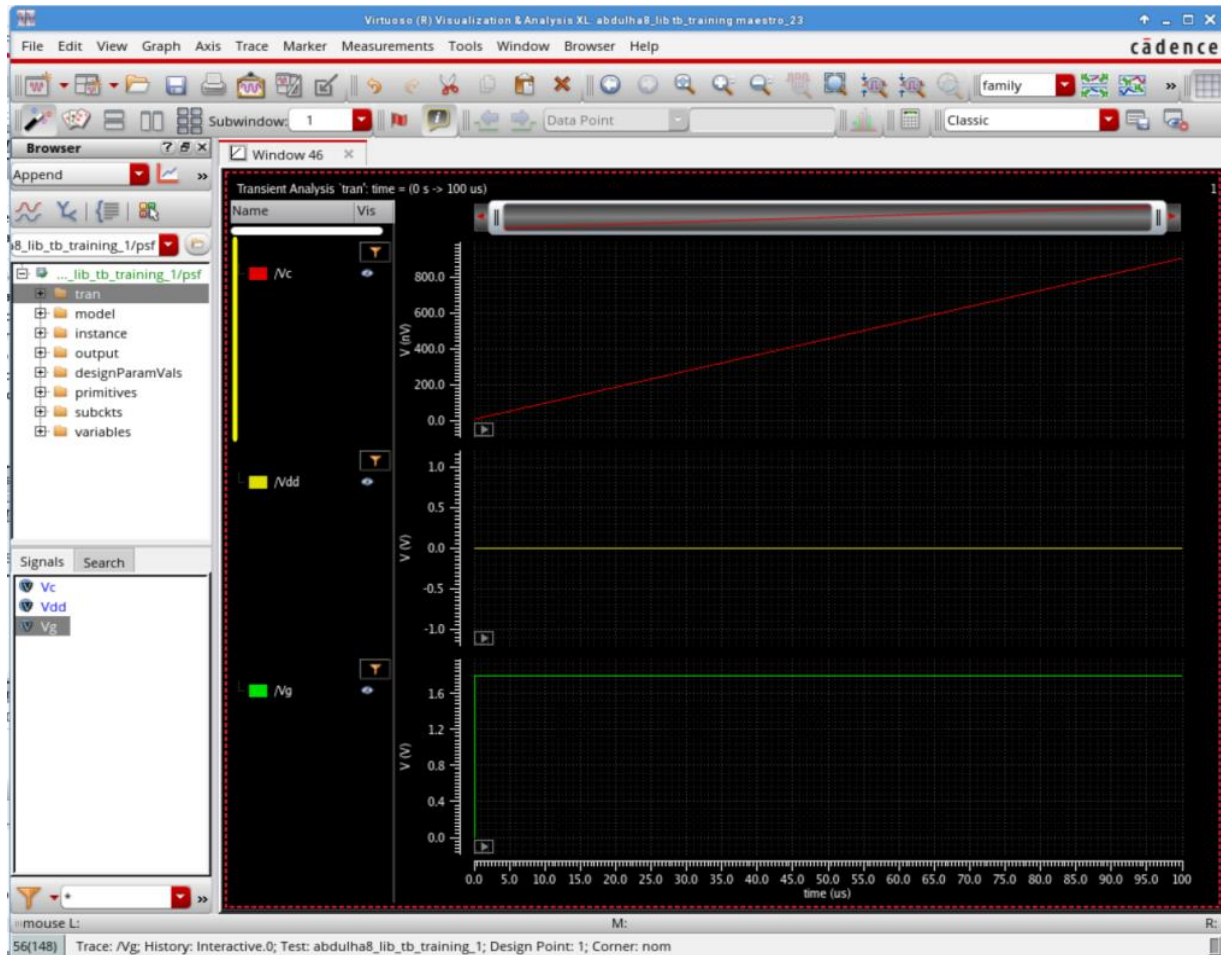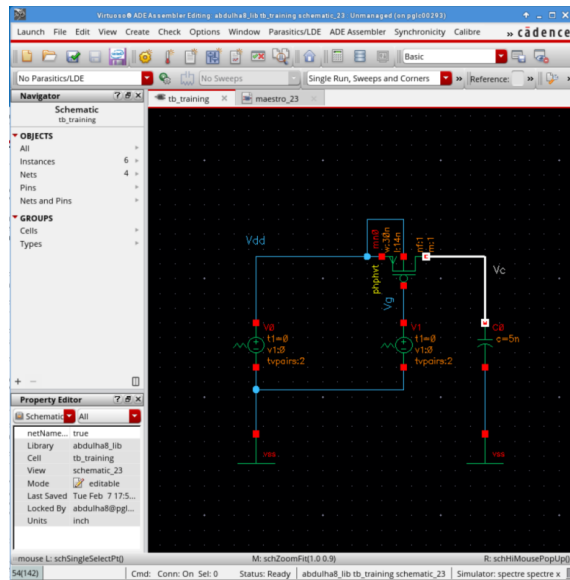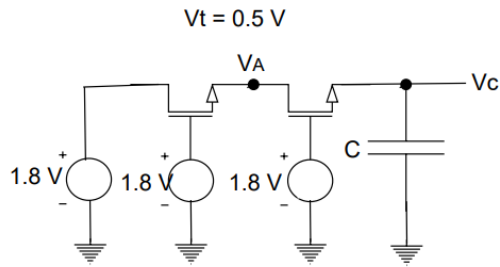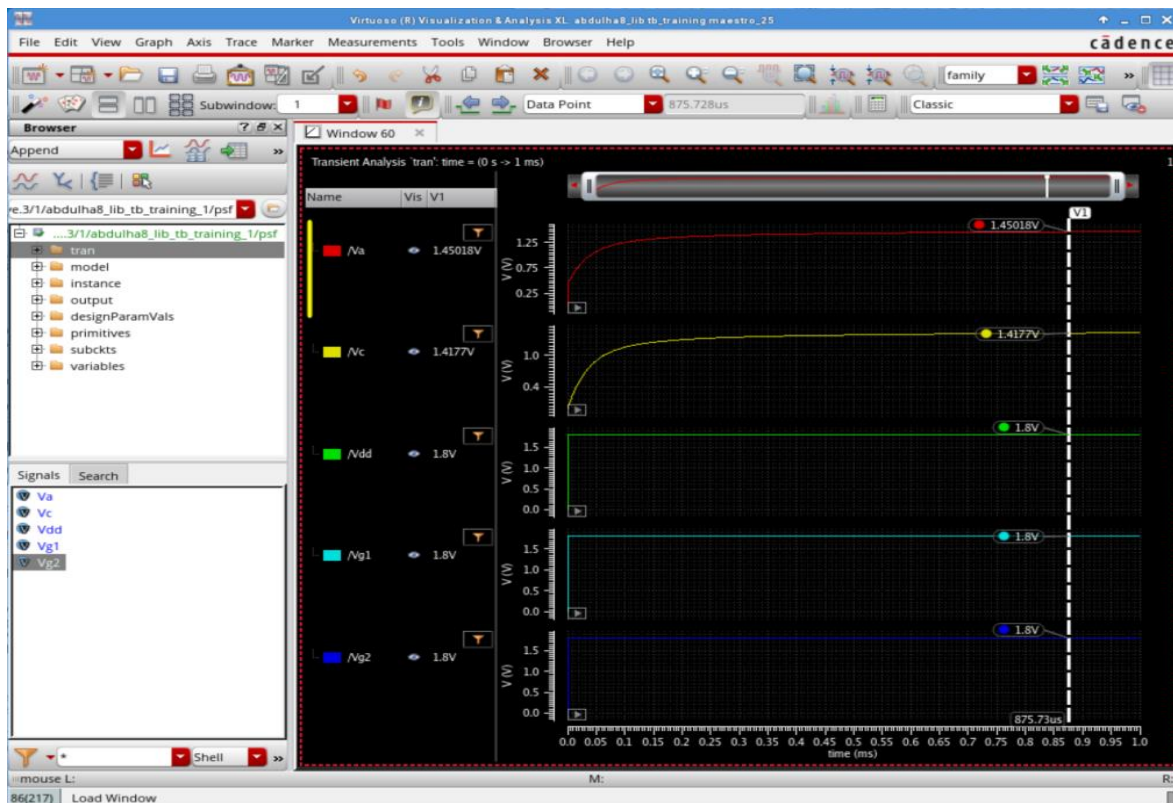
|Vt|= 0.5 V



Fig.23

**Q-25:** Initially capacitor C is discharged. Find the value of Vc and VA at steady state.

Vt = 0.5 V



Fig.25

**Q-26:** Initially capacitor C is discharged. Find the value of Vc and $V_A$ at steady state.

Vt = 0.5 V



Fig.26

**Q-27:** Initially capacitor C is discharged. Find the value of Vc and VA at steady state.
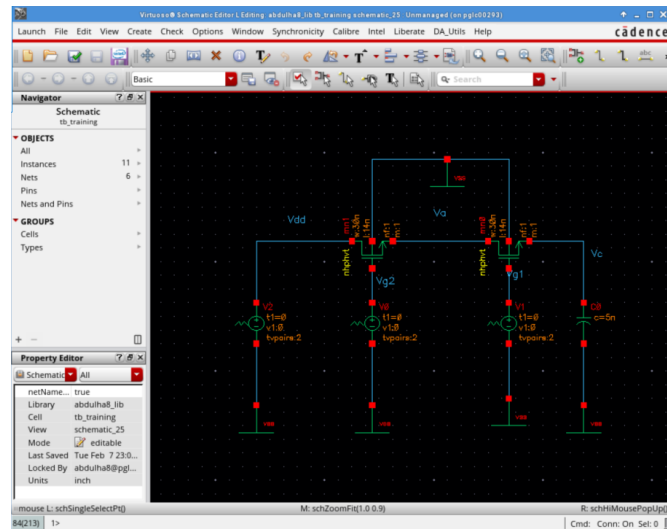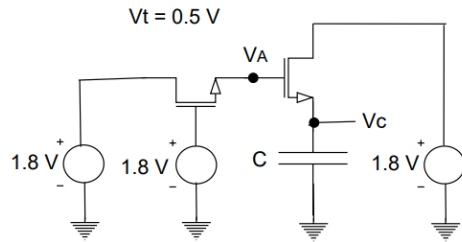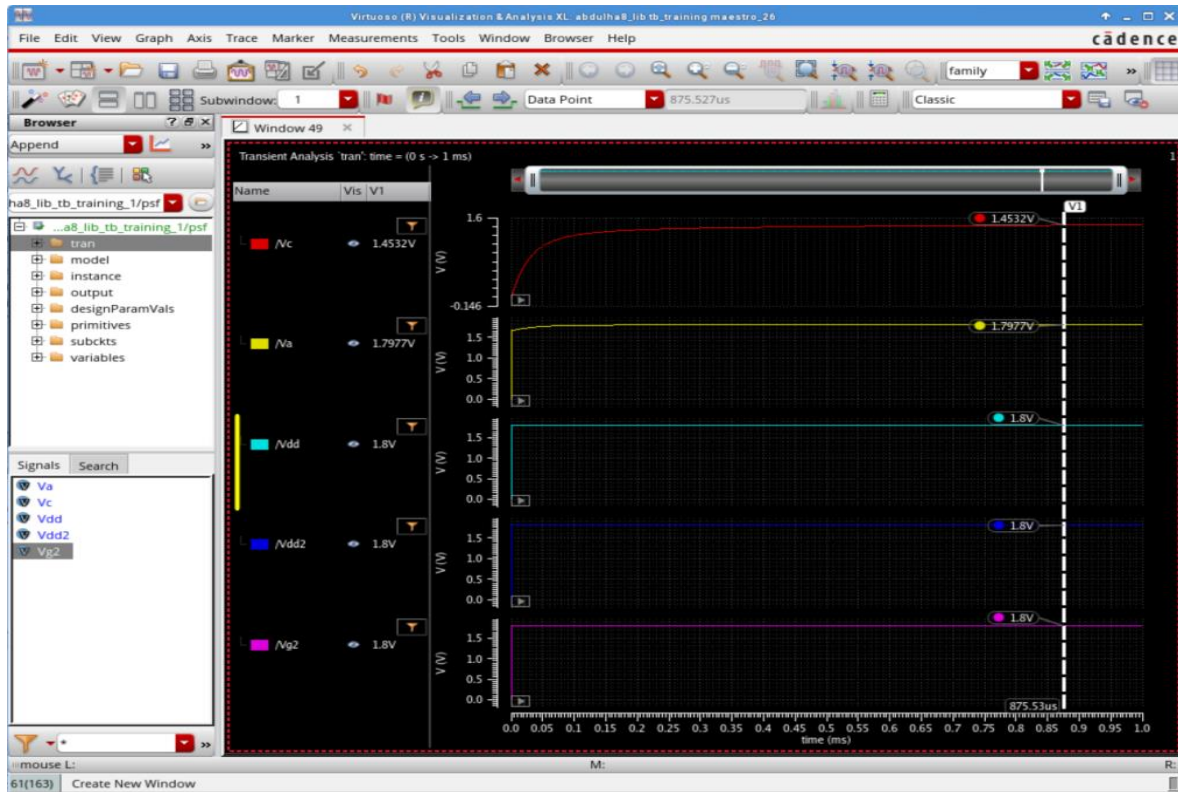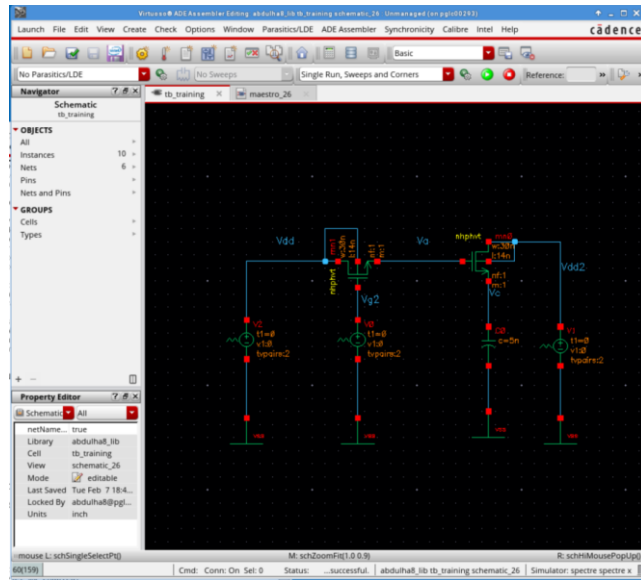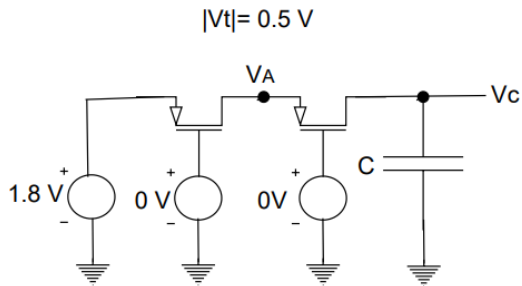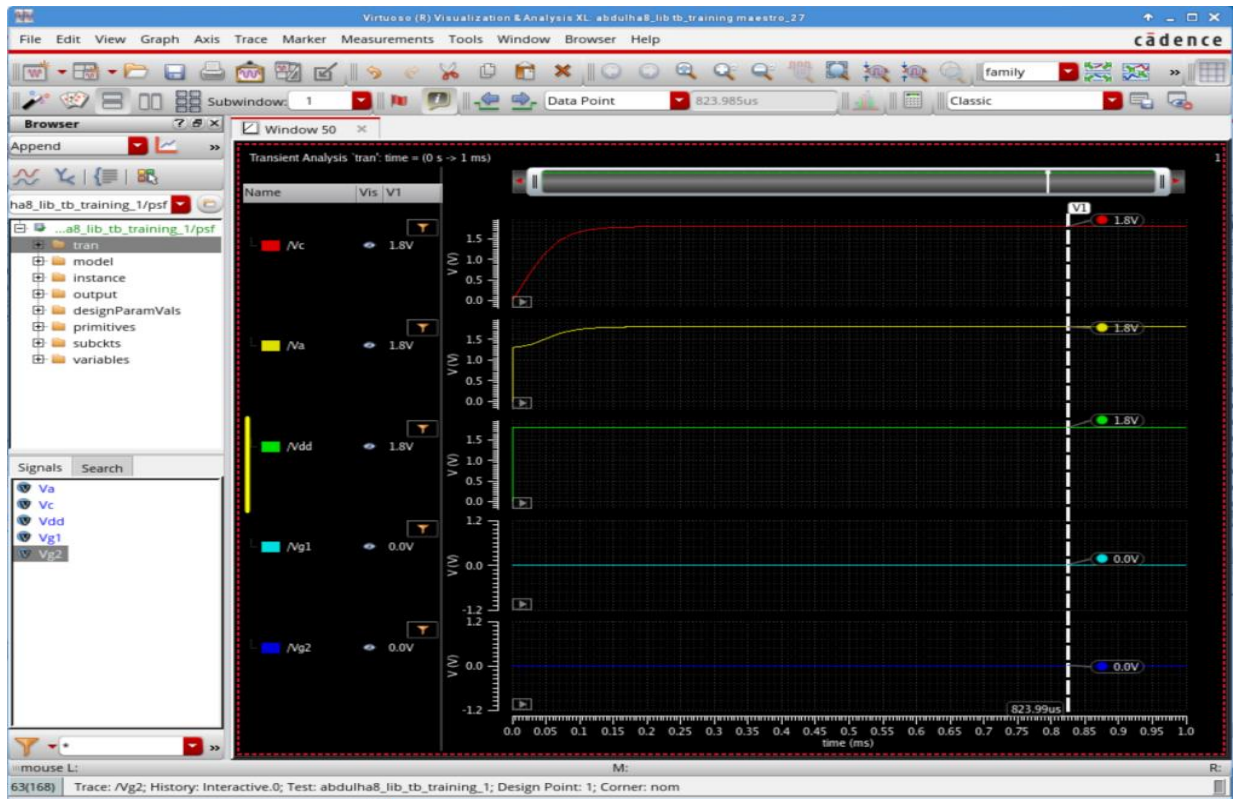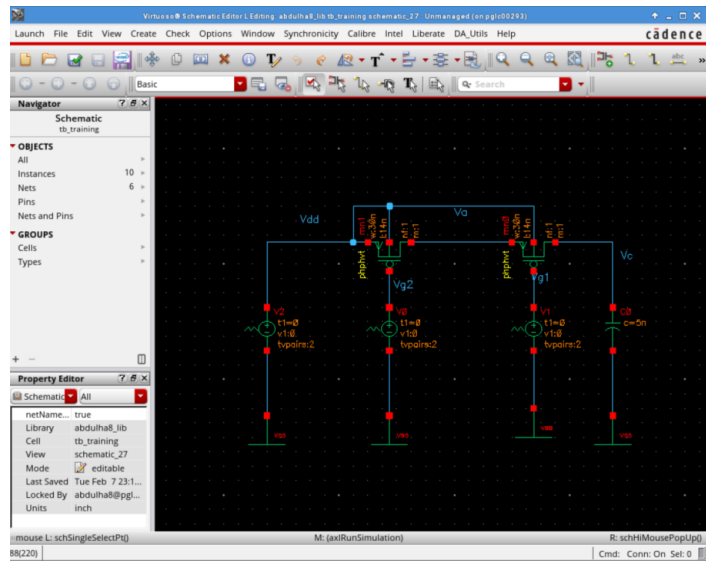
|Vt|= 0.5 V



Fig.27

Q-28: Initially capacitor C is discharged. Find
the value of Vc and V$_A$ at steady state.

|Vt|= 0.5 V

V$_A$

V$_C$
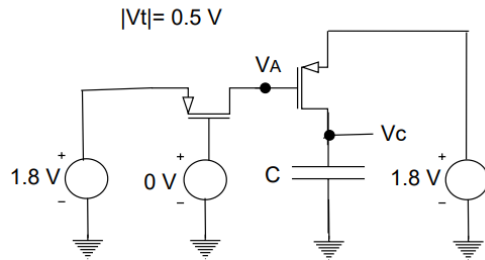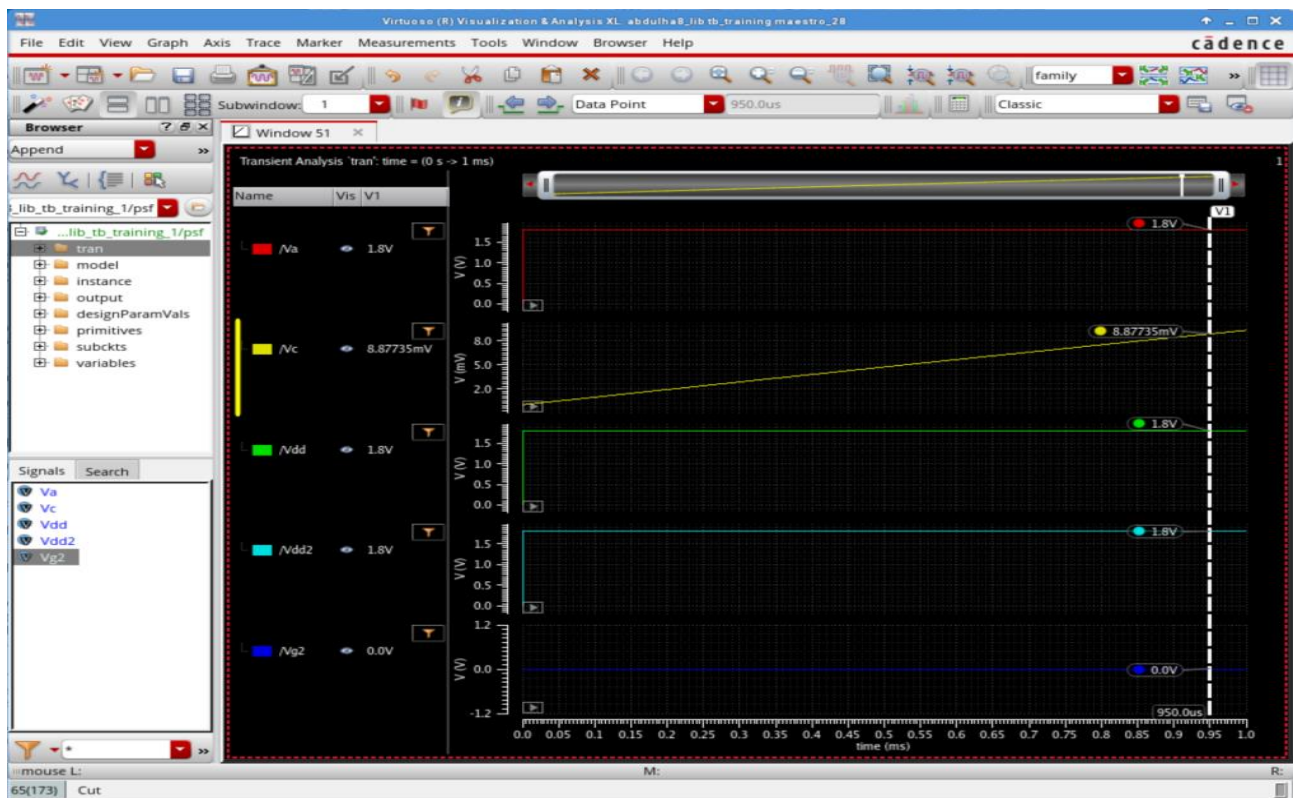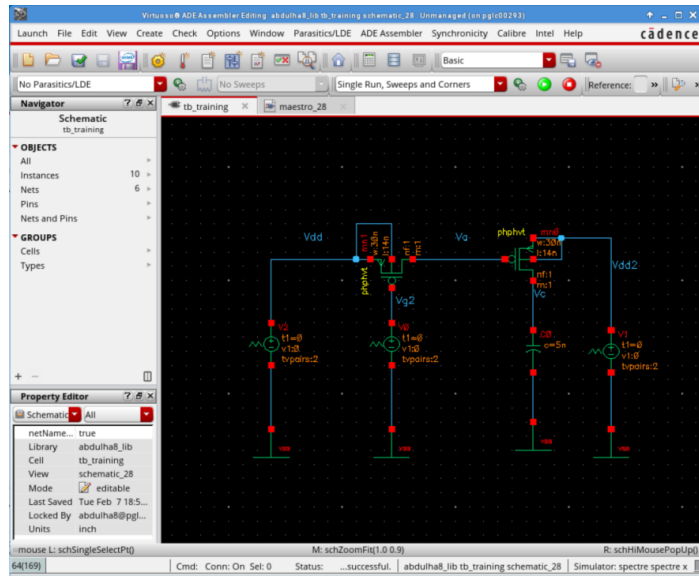
1.8 V    0 V    C    1.8 V

Fig.28

Q-29: Initially capacitor C is fully charged to 1.8 V. Find the value of V1, V2, V3 and V4 at steady state.
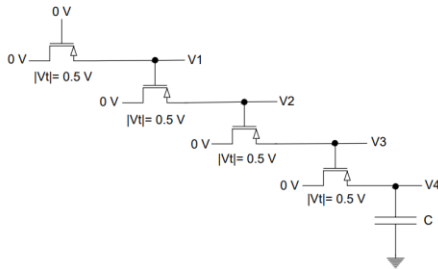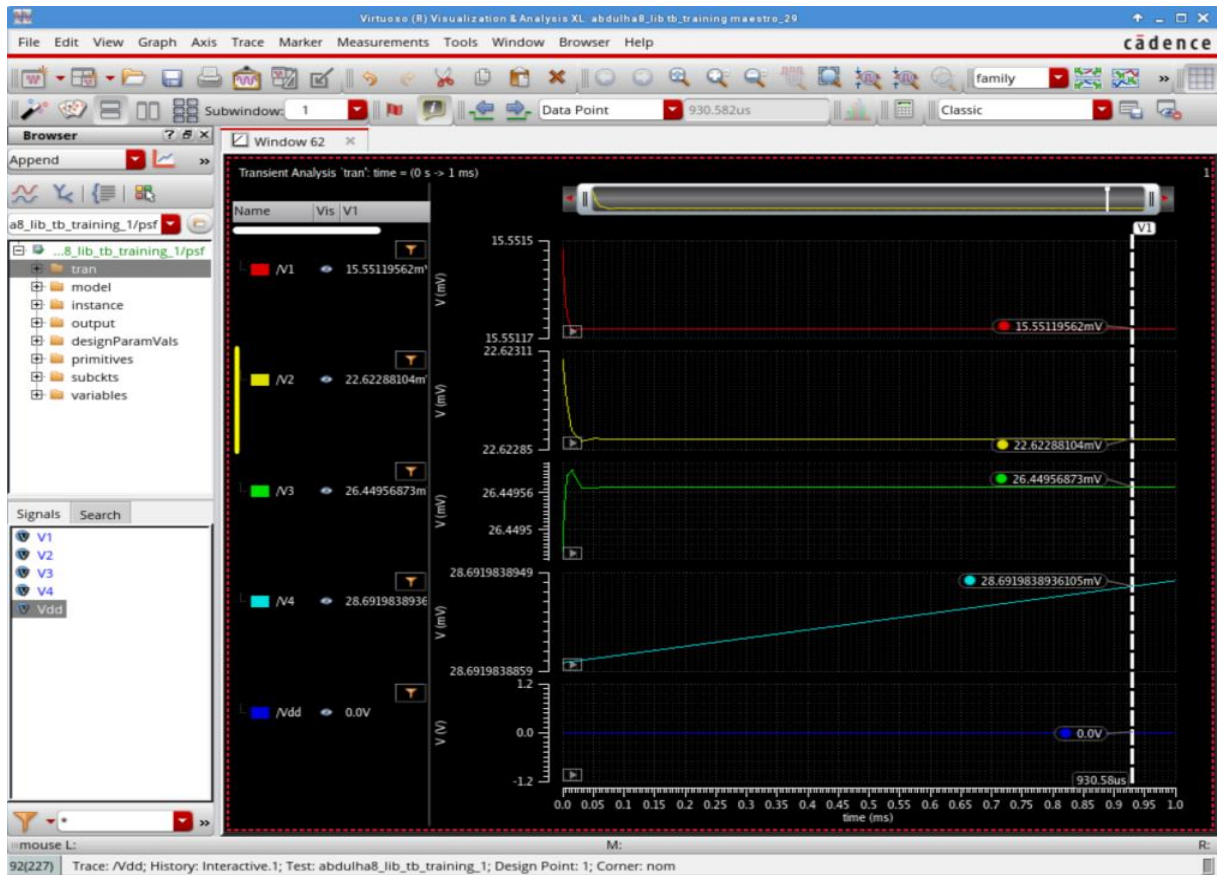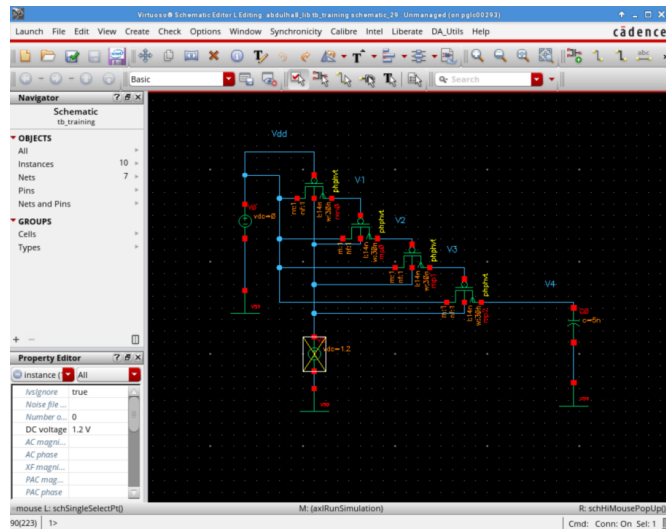


Fig.29

Q-30: Initially capacitor C is fully discharged 0V. Find the value of V1, V2, V3 and V4 at steady state. Assume the higher potential side is drain terminal.

1.8 V

1.8 V ⊣ Vt = 0.5 V — V1

1.8 V ⊣ Vt = 0.5 V — V2

1.8 V ⊣ Vt = 0.5 V — V3

1.8 V ⊣ Vt = 0.5 V — V4

C