Audit Course Session 2

AUDIT COURSE
ELECTRONIC CIRCUITS 2: SIMULATION BASED STUDY

Kindly update your name and roll no, once this document is shared with you
Time slot to complete your work is **40 MINUTES**
Date: 19/1/2021
Kindly upload your schematic & waveform images here, every 10 minutes, indicating your progress and intention to completion of WORK within time slot allotted

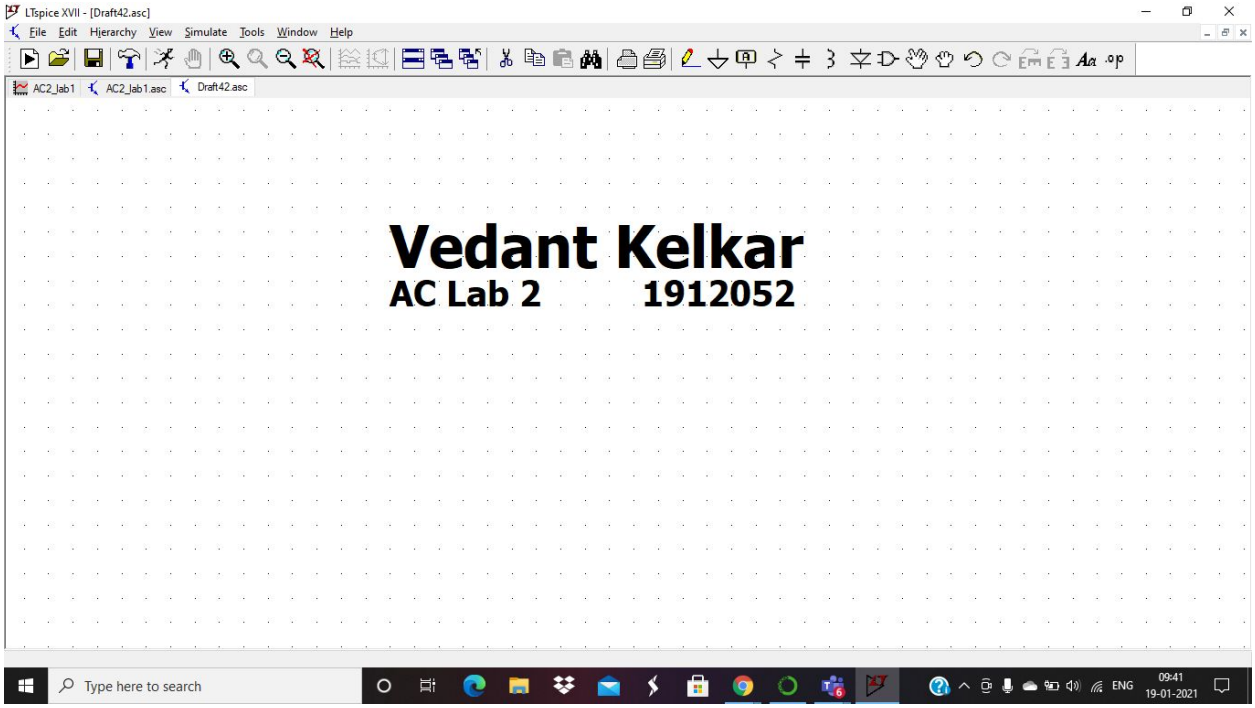
Time slot allotted to you all for the completion of Session 1 is 40 MINUTES

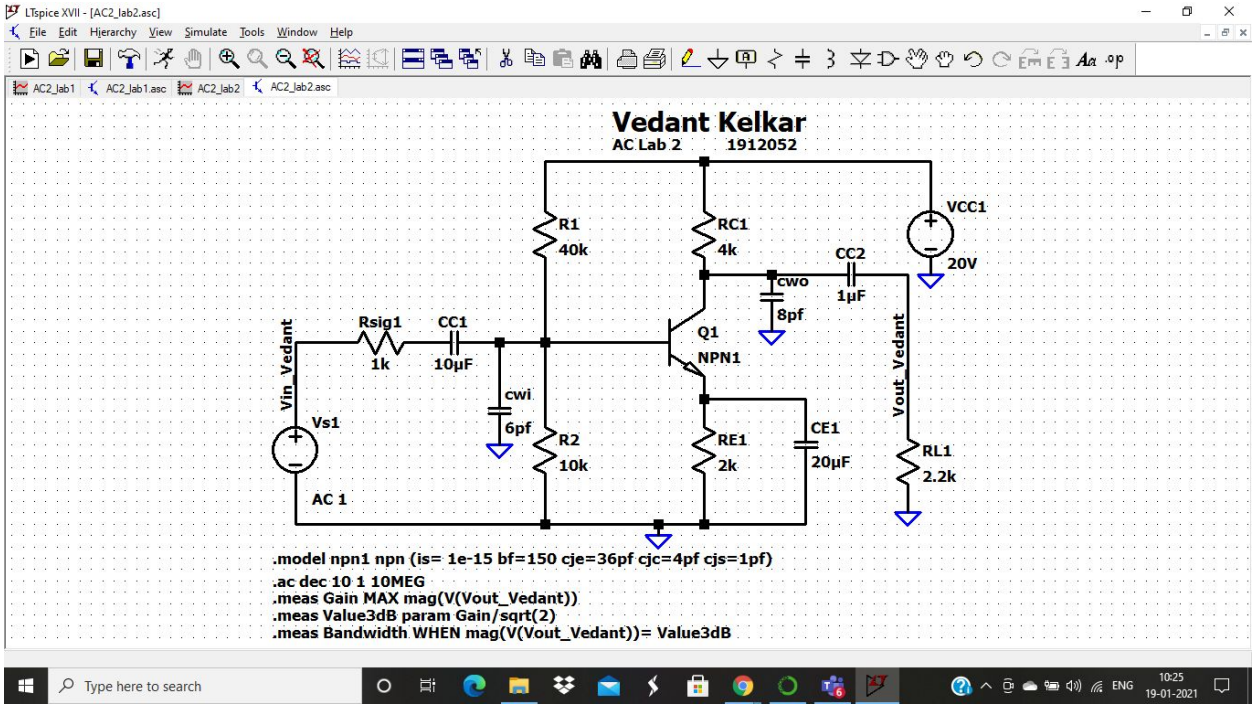
Kindly upload your work (only circuit schematic & waveform in LTSpice) in the shared google doc between this time slot only.

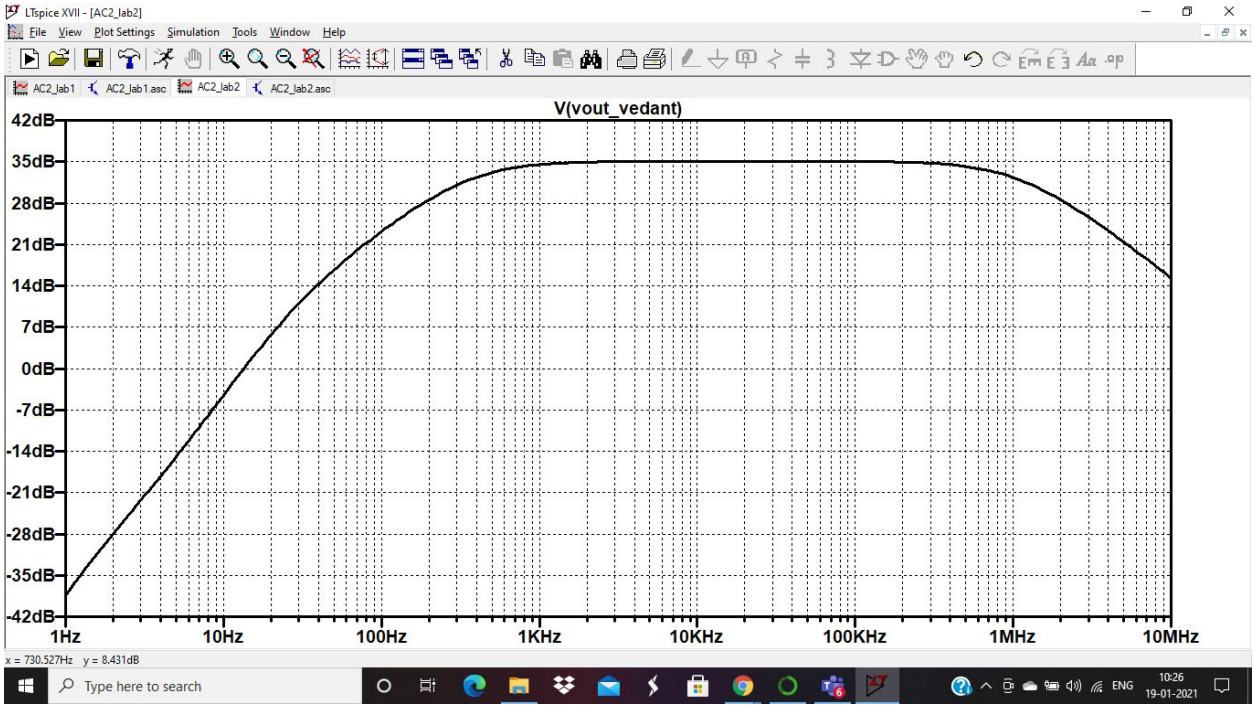
Follow these instruction strictly:
1, Start sharp ON TIME, by posting your name and roll no and **screenshot of your LT spice work screen (time and date MUST BE VISIBLE)**
2. Upload your work every 10 minutes, i.e LT spice work screen
3. This means you will upload LT spice work screen 4 times during this time slot.
4. Point 3 indicates your readiness and presences for completion of Session 1

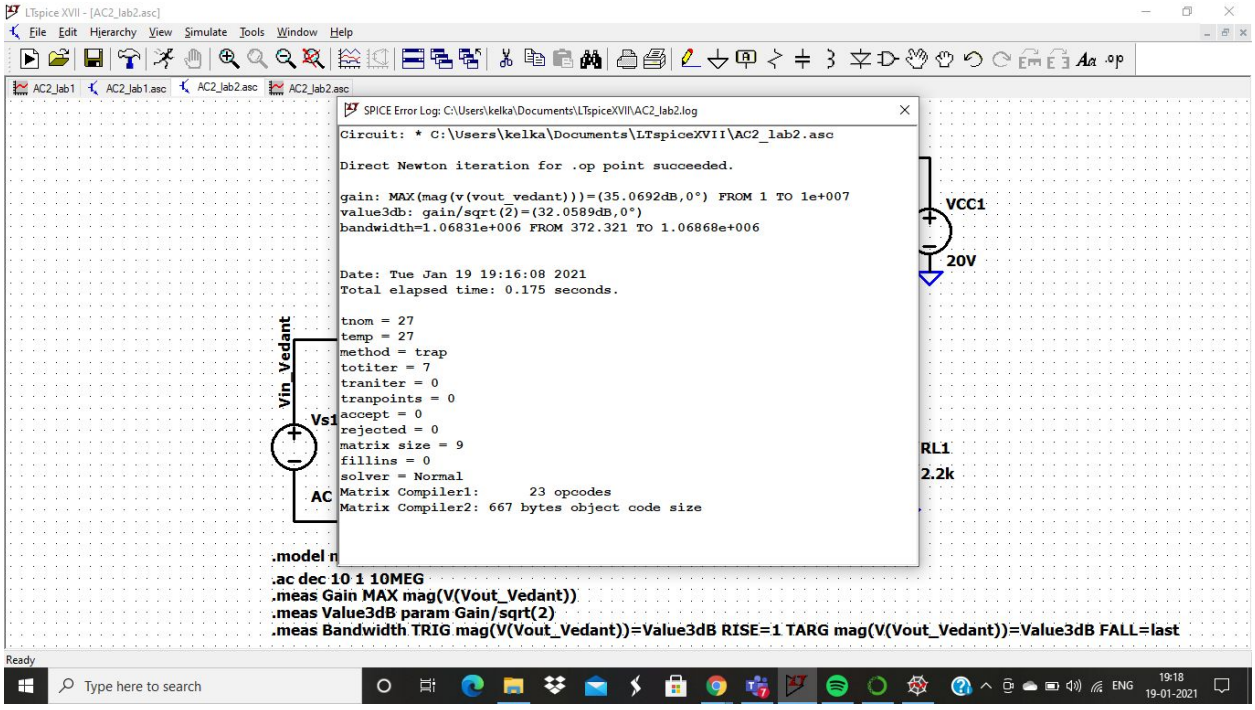
You are entitled for 1 CREDIT per session only if you follow above instruction to the details

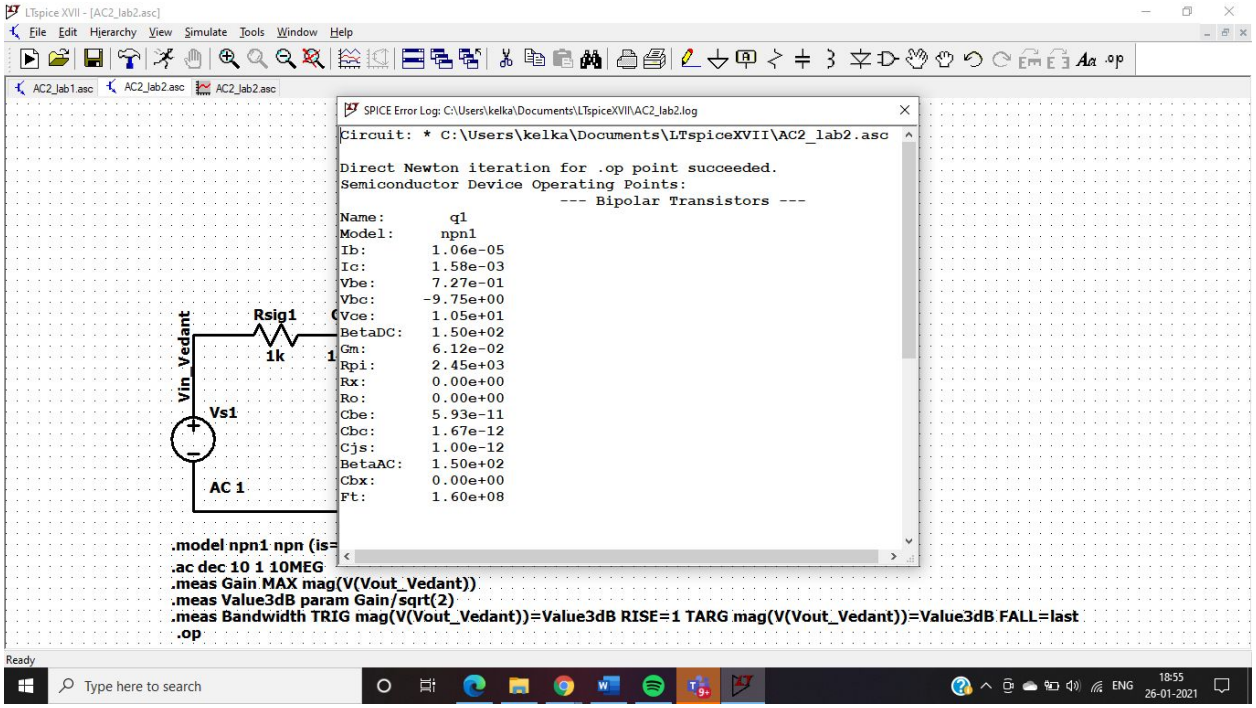
STUDENTS WORK AREA STARTS HERE


LTspice XVII - [Draft42.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab1 AC2_lab1.asc Draft42.asc
Vedant Kelkar
AC Lab 2 1912052
Type here to search
ENG
09:41
19-01-2021


LTspice XVII - [AC2_lab2.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab1 AC2_lab1.asc AC2_lab2 AC2_lab2.asc
Vedant Kelkar
AC Lab 2 1912052
R1
40k
RC1
4k
VCC1
20V
CC2
1µF
cwo
8pf
Rsig1
1k
CC1
10µF
Q1
NPN1
Vin_Vedant
Vout_Vedant
cwi
6pf
Vs1
AC 1
R2
10k
RE1
2k
CE1
20µF
RL1
2.2k
.model npn1 npn (is= 1e-15 bf=150 cje=36pf cjc=4pf cjs=1pf)
.ac dec 10 1 10MEG
.meas Gain MAX mag(V(Vout_Vedant))
.meas Value3dB param Gain/sqrt(2)
.meas Bandwidth WHEN mag(V(Vout_Vedant))= Value3dB
Type here to search
ENG
10:25
19-01-2021

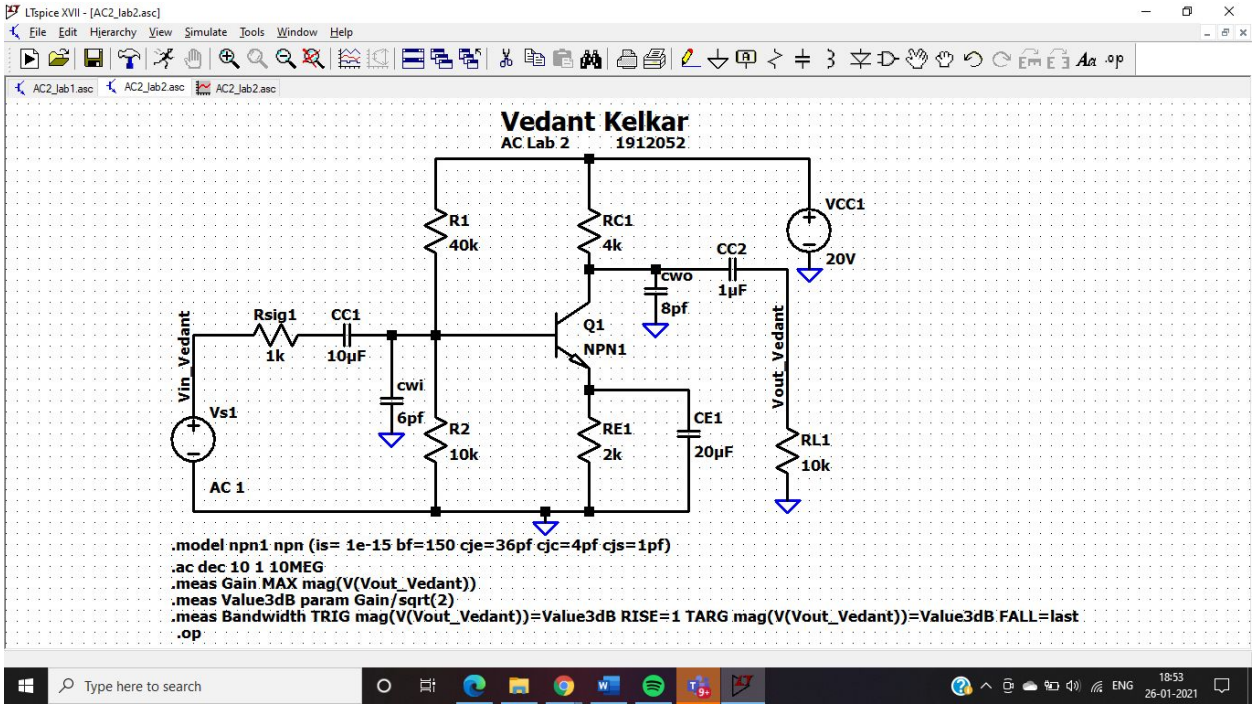

LTspice XVII - [AC2_lab2]
File View Plot Settings Simulation Tools Window Help
AC2_lab1 AC2_lab1.asc AC2_lab2 AC2_lab2.asc
V(vout_vedant)
42dB
35dB
28dB
21dB
14dB
7dB
0dB
-7dB
-14dB
-21dB
-28dB
-35dB
-42dB
1Hz
10Hz
100Hz
1KHz
10KHz
100KHz
1MHz
10MHz
x = 730.527Hz y = 8.431dB
Type here to search
ENG
10:26
19-01-2021

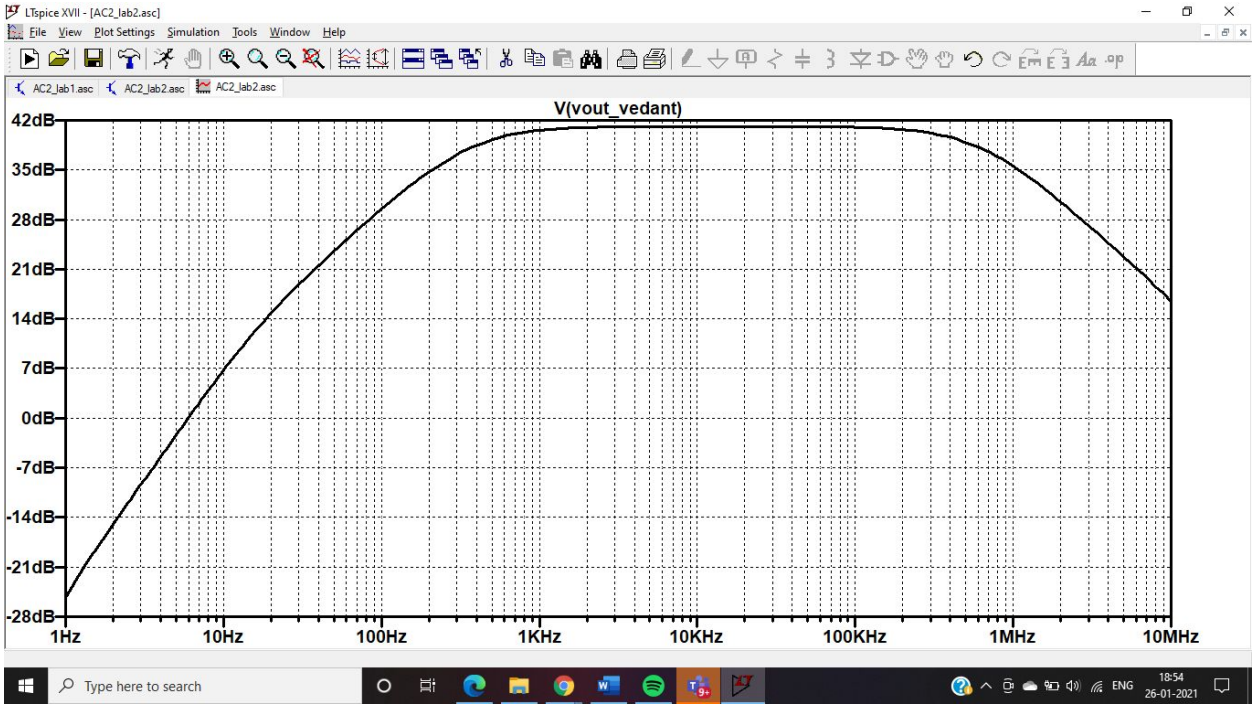

LTspice XVII - [AC2_lab2.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab1 AC2_lab1.asc AC2_lab2.asc AC2_lab2.asc
SPICE Error Log: C:\Users\kelka\Documents\LTspiceXVII\AC2_lab2.log
Circuit: * C:\Users\kelka\Documents\LTspiceXVII\AC2_lab2.asc
Direct Newton iteration for .op point succeeded.
gain: MAX(mag(v(vout_vedant)))=(35.0692dB,0°) FROM 1 TO 1e+007
value3db: gain/sqrt(2)=(32.0589dB,0°)
bandwidth=1.06831e+006 FROM 372.321 TO 1.06868e+006
Date: Tue Jan 19 19:16:08 2021
Total elapsed time: 0.175 seconds.
tnom = 27
temp = 27
method = trap
totiter = 7
traniter = 0
tranpoints = 0
accept = 0
rejected = 0
matrix size = 9
fillins = 0
solver = Normal
Matrix Compiler1: 23 opcodes
Matrix Compiler2: 667 bytes object code size
VCC1
20V
Vin_Vedant
Vs1
AC
RL1
2.2k
.model n
.ac dec 10 1 10MEG
.meas Gain MAX mag(V(Vout_Vedant))
.meas Value3dB param Gain/sqrt(2)
.meas Bandwidth TRIG mag(V(Vout_Vedant))=Value3dB RISE=1 TARG mag(V(Vout_Vedant))=Value3dB FALL=last
Ready
Type here to search
ENG
19:18
19-01-2021

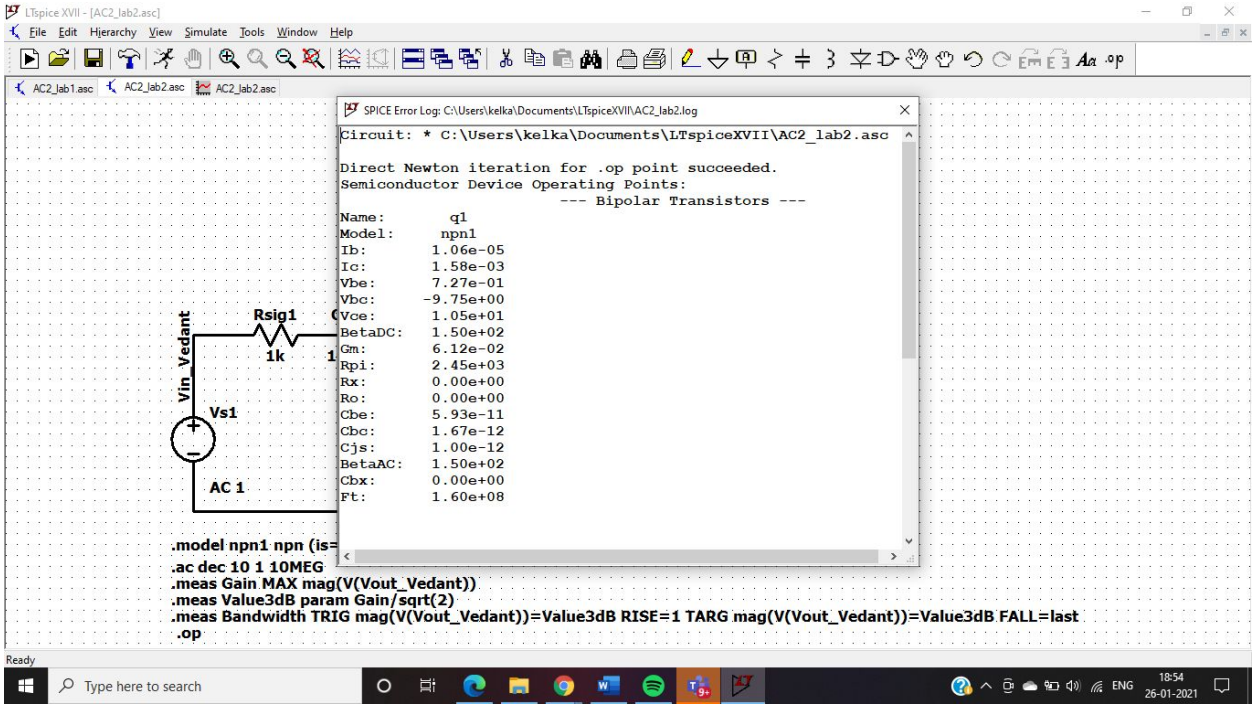


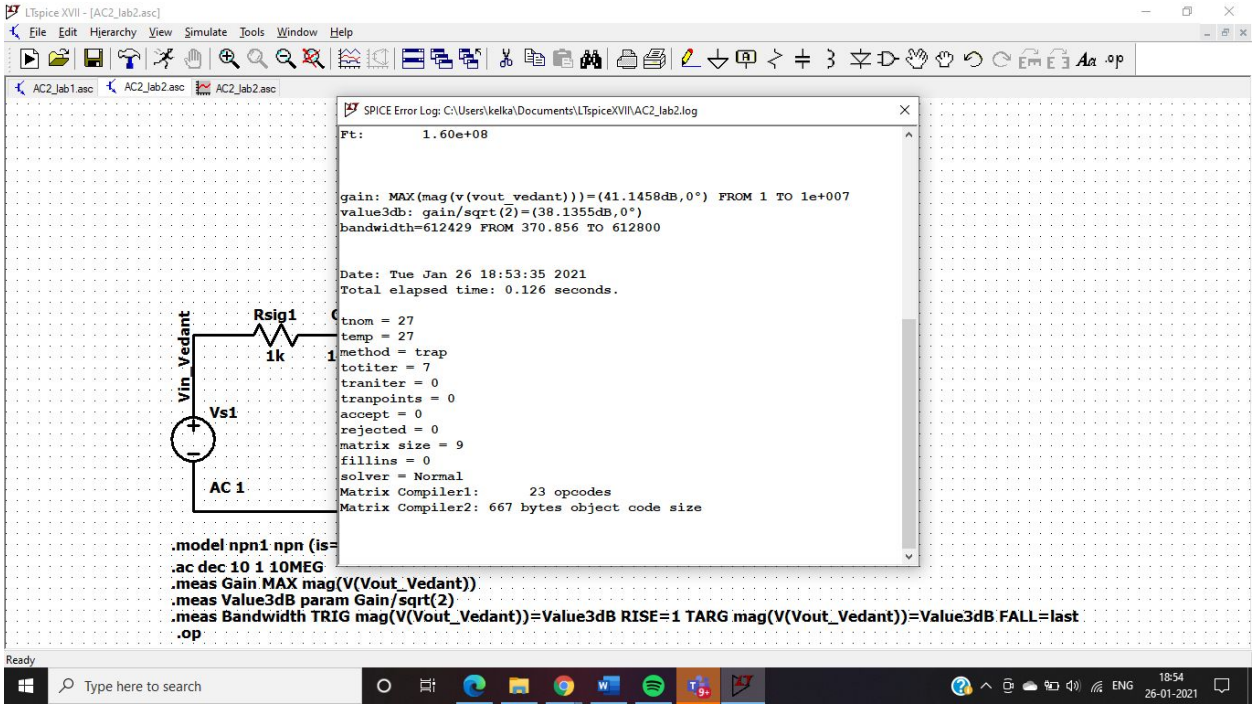
BW sim	BW calc
1.06831MHz	1.2895MHz

Ex1


LTspice XVII - [AC2_lab2.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab1.asc AC2_lab2.asc AC2_lab2.asc
Vedant Kelkar
AC Lab 2 1912052
R1
40k
RC1
4k
VCC1
20V
CC2
1µF
cwo
8pf
Rsig1
1k
CC1
10µF
Q1
NPN1
Vin_Vedant
Vout_Vedant
cwi
6pf
Vs1
AC 1
R2
10k
RE1
2k
CE1
20µF
RL1
10k
.model npn1 npn (is= 1e-15 bf=150 cje=36pf cjc=4pf cjs=1pf)
.ac dec 10 1 10MEG
.meas Gain MAX mag(V(Vout_Vedant))
.meas Value3dB param Gain/sqrt(2)
.meas Bandwidth TRIG mag(V(Vout_Vedant))=Value3dB RISE=1 TARG mag(V(Vout_Vedant))=Value3dB FALL=last
.op
Type here to search
ENG
18:53
26-01-2021

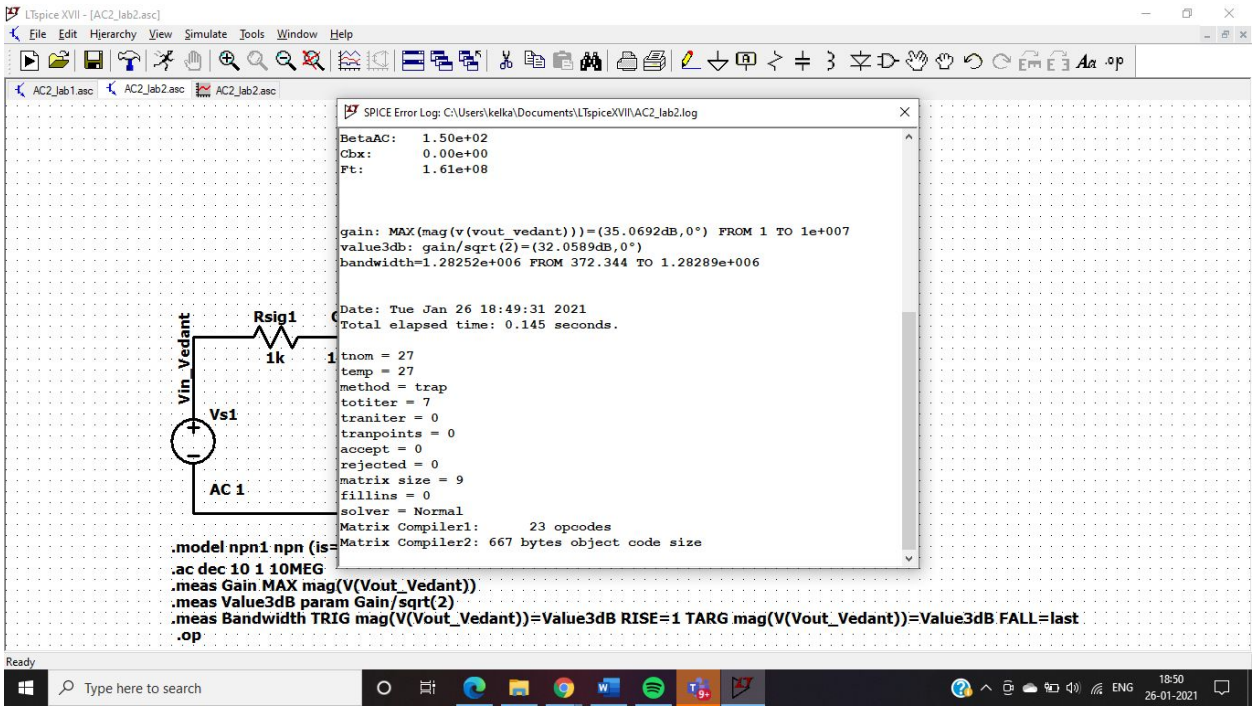

LTspice XVII - [AC2_lab2.asc]
File View Plot Settings Simulation Tools Window Help
AC2_lab1.asc AC2_lab2.asc AC2_lab2.asc
V(vout_vedant)
42dB
35dB
28dB
21dB
14dB
7dB
0dB
-7dB
-14dB
-21dB
-28dB
1Hz
10Hz
100Hz
1KHz
10KHz
100KHz
1MHz
10MHz
Type here to search
ENG
18:54
26-01-2021

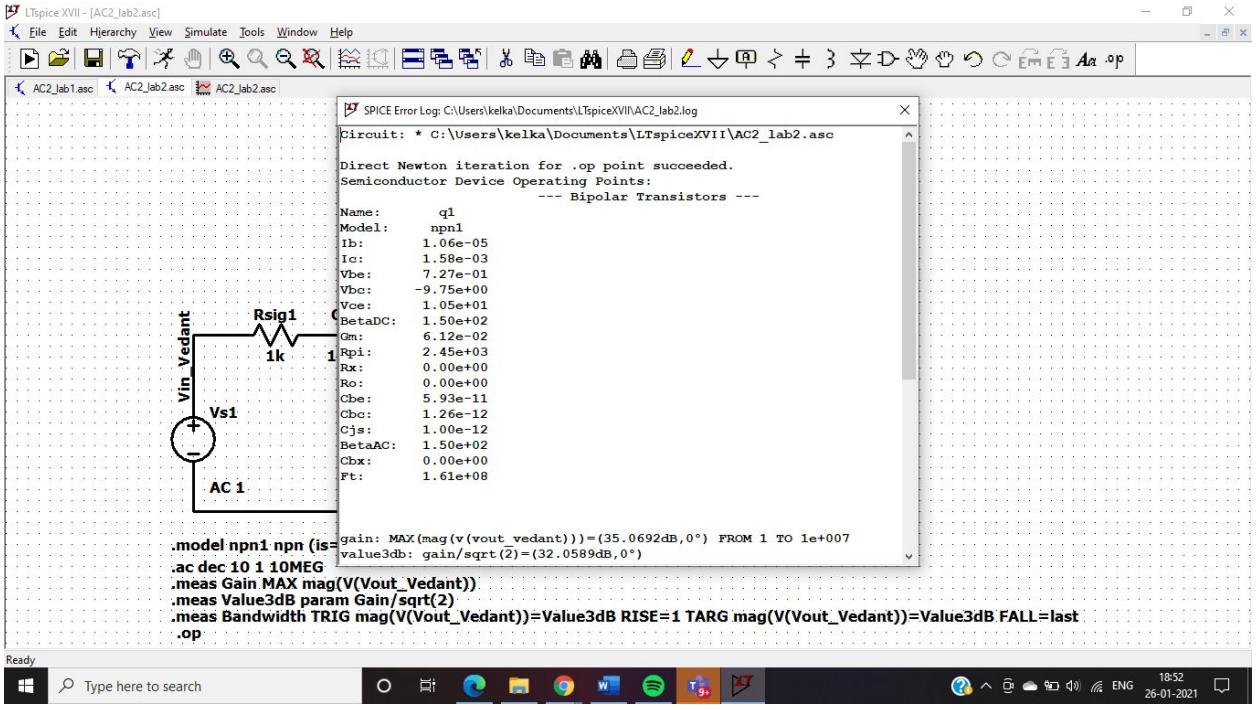


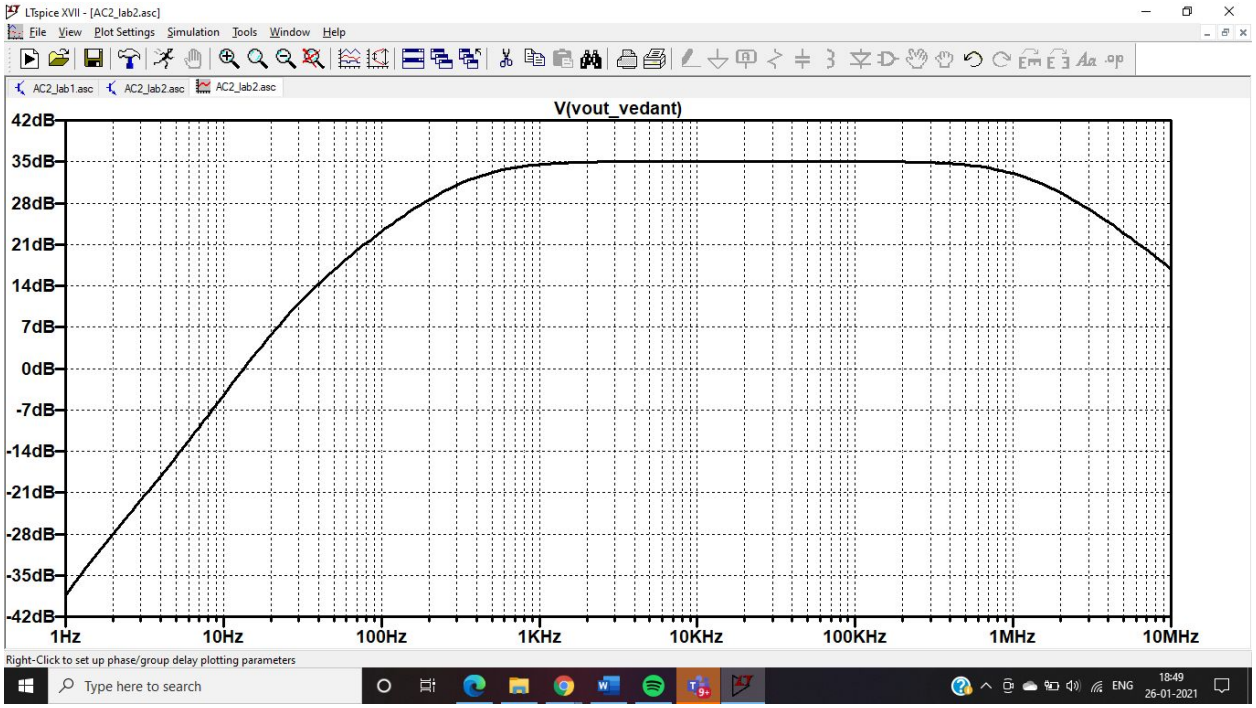


BW sim	BW calc
612429Hz	613.52KHz

Ex2

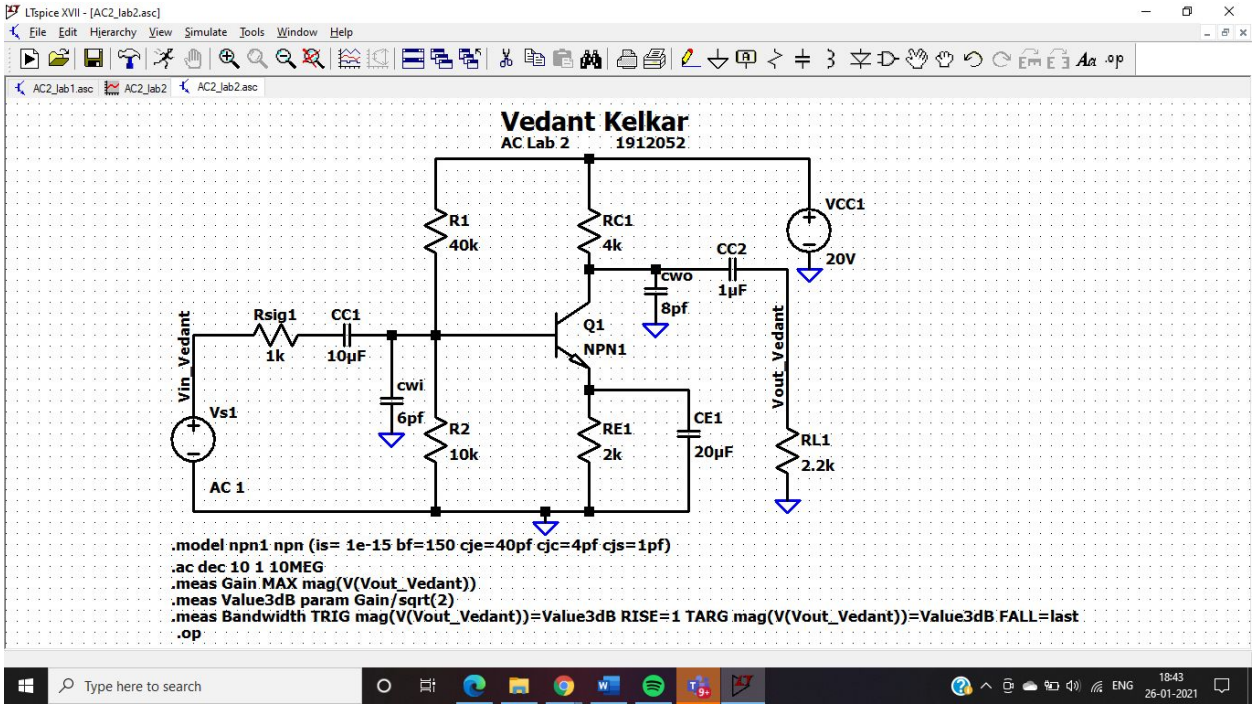

LTspice XVII - [AC2_lab2.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab1.asc AC2_lab2.asc AC2_lab2.asc
SPICE Error Log: C:\Users\kelka\Documents\LTspiceXVII\AC2_lab2.log
BetaAC: 1.50e+02
Cbx: 0.00e+00
Ft: 1.61e+08
gain: MAX(mag(v(vout_vedant)))=(35.0692dB,0°) FROM 1 TO 1e+007
value3db: gain/sqrt(2)=(32.0589dB,0°)
bandwidth=1.28252e+006 FROM 372.344 TO 1.28289e+006
Date: Tue Jan 26 18:49:31 2021
Total elapsed time: 0.145 seconds.
tnom = 27
temp = 27
method = trap
totiter = 7
traniter = 0
tranpoints = 0
accept = 0
rejected = 0
matrix size = 9
fillins = 0
solver = Normal
Matrix Compiler1: 23 opcodes
Matrix Compiler2: 667 bytes object code size
Rsig1
1k
Vin_Vedant
Vs1
AC 1
.model npn1 npn (is=
.ac dec 10 1 10MEG
.meas Gain MAX mag(V(Vout_Vedant))
.meas Value3dB param Gain/sqrt(2)
.meas Bandwidth TRIG mag(V(Vout_Vedant))=Value3dB RISE=1 TARG mag(V(Vout_Vedant))=Value3dB FALL=last
.op
Ready
Type here to search
ENG
18:50
26-01-2021

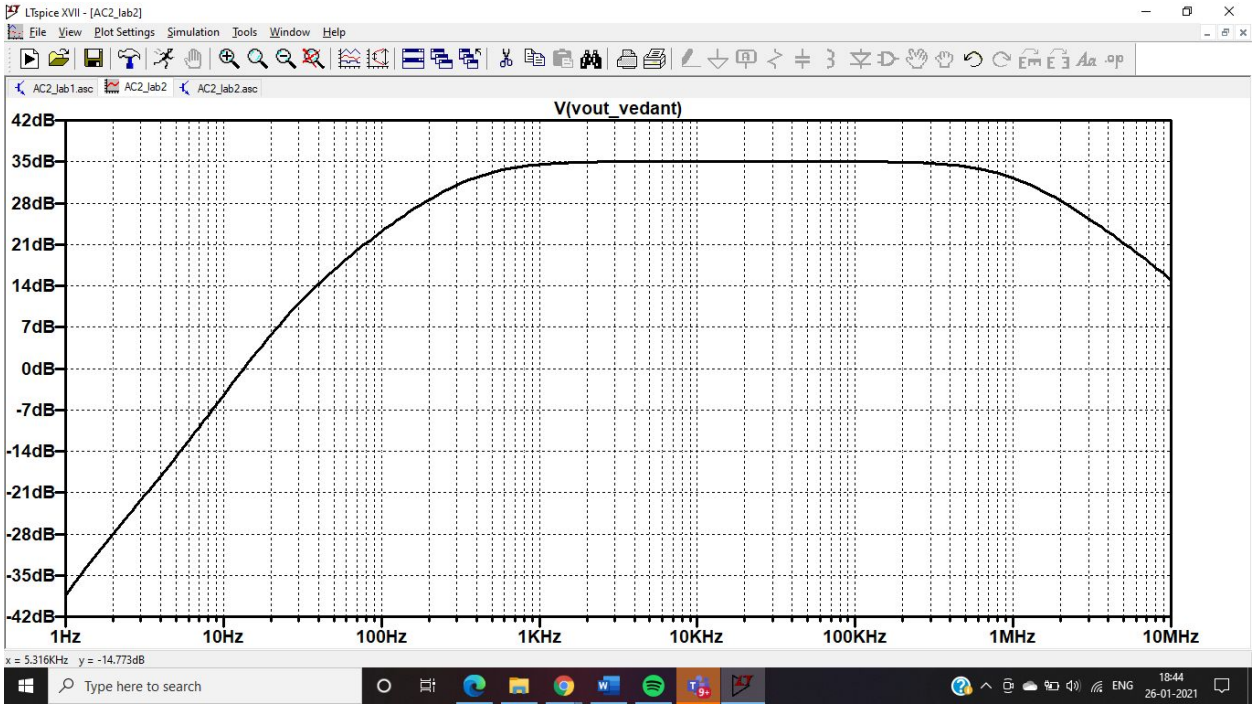

LTspice XVII - [AC2_lab2.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab1.asc AC2_lab2.asc AC2_lab2.asc
SPICE Error Log: C:\Users\kelka\Documents\LTspiceXVII\AC2_lab2.log
Circuit: * C:\Users\kelka\Documents\LTspiceXVII\AC2_lab2.asc
Direct Newton iteration for .op point succeeded.
Semiconductor Device Operating Points:
--- Bipolar Transistors ---
Name: q1
Model: npn1
Ib: 1.06e-05
Ic: 1.58e-03
Vbe: 7.27e-01
Vbc: -9.75e+00
Vce: 1.05e+01
BetaDC: 1.50e+02
Gm: 6.12e-02
Rpi: 2.45e+03
Rx: 0.00e+00
Ro: 0.00e+00
Cbe: 5.93e-11
Cbc: 1.26e-12
Cjs: 1.00e-12
BetaAC: 1.50e+02
Cbx: 0.00e+00
Ft: 1.61e+08
gain: MAX(mag(v(vout_vedant)))=(35.0692dB,0°) FROM 1 TO 1e+007
value3db: gain/sqrt(2)=(32.0589dB,0°)
Rsig1
1k
Vin_Vedant
Vs1
AC 1
.model npn1 npn (is=
.ac dec 10 1 10MEG
.meas Gain MAX mag(V(Vout_Vedant))
.meas Value3dB param Gain/sqrt(2)
.meas Bandwidth TRIG mag(V(Vout_Vedant))=Value3dB RISE=1 TARG mag(V(Vout_Vedant))=Value3dB FALL=last
.op
Ready
Type here to search
ENG
18:52
26-01-2021

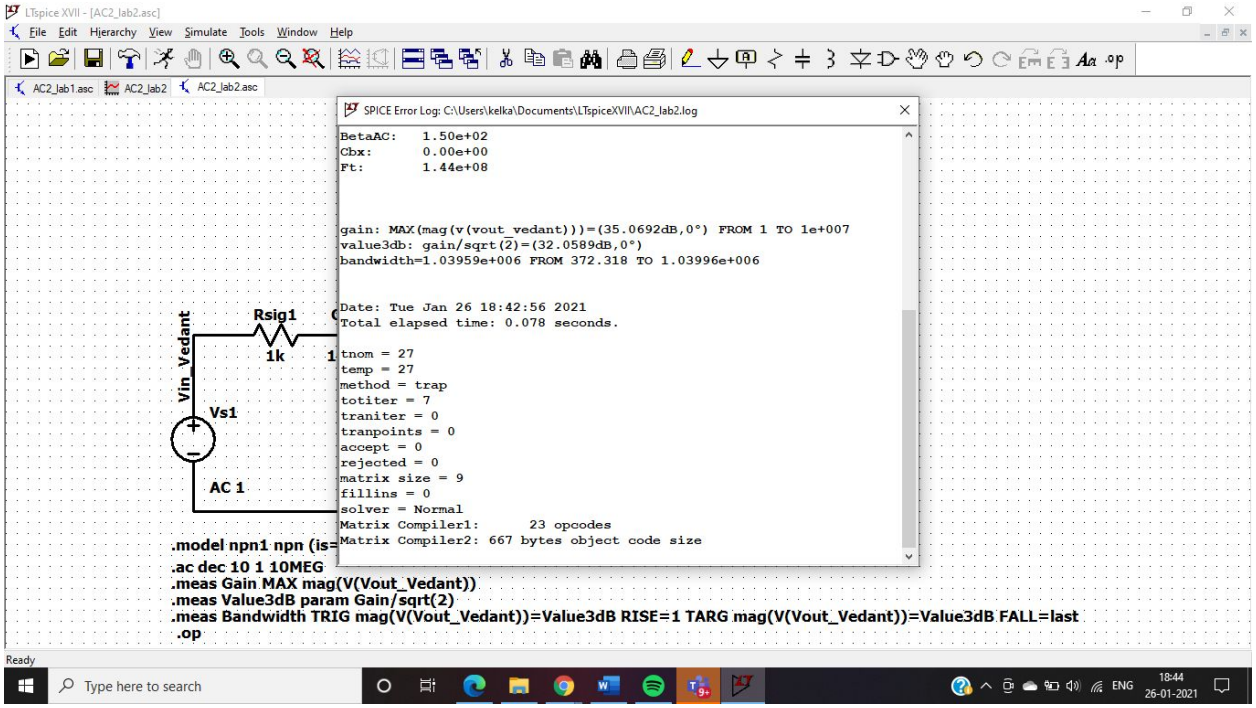


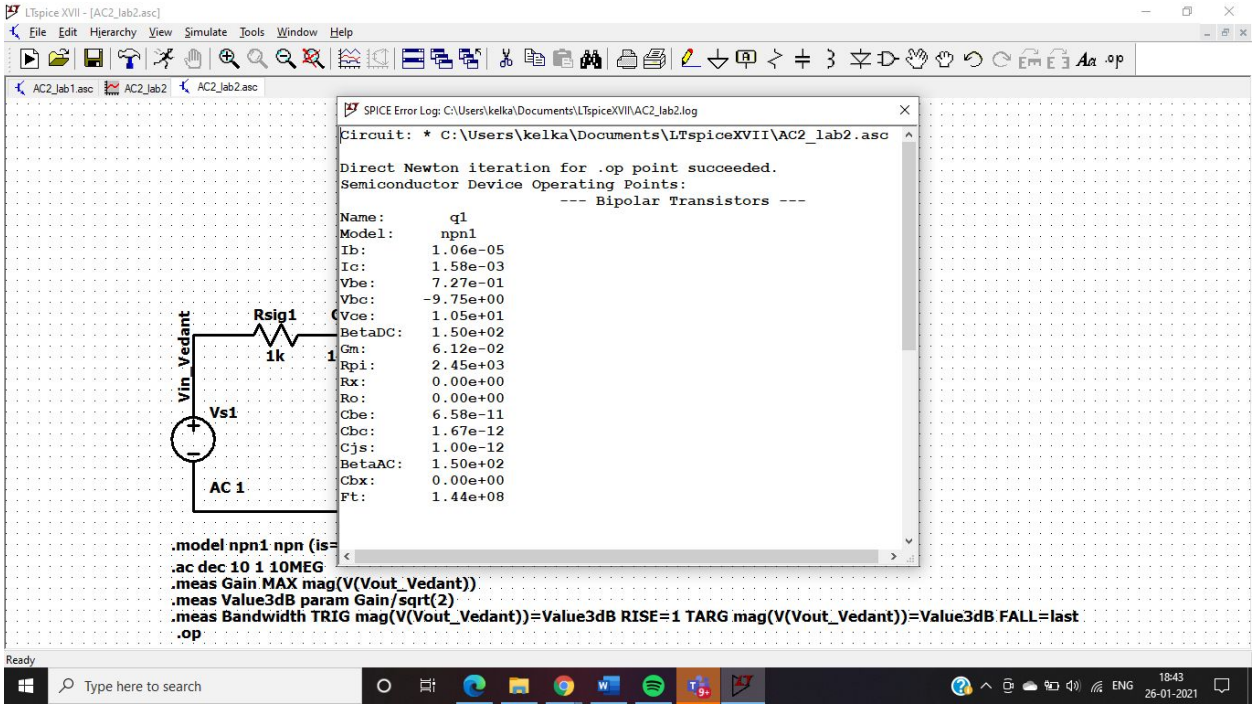
BW sim	BW calc
1.28252MHz	1.3021MHz

Ex3


LTspice XVII - [AC2_lab2.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab1.asc AC2_lab2 AC2_lab2.asc
Vedant Kelkar
AC Lab 2 1912052
R1
40k
RC1
4k
VCC1
20V
CC2
1µF
cwo
8pf
Rsig1
1k
CC1
10µF
Q1
NPN1
Vin_Vedant
Vout_Vedant
cwi
6pf
Vs1
AC 1
R2
10k
RE1
2k
CE1
20µF
RL1
2.2k
.model npn1 npn (is= 1e-15 bf=150 cje=40pf cjc=4pf cjs=1pf)
.ac dec 10 1 10MEG
.meas Gain MAX mag(V(Vout_Vedant))
.meas Value3dB param Gain/sqrt(2)
.meas Bandwidth TRIG mag(V(Vout_Vedant))=Value3dB RISE=1 TARG mag(V(Vout_Vedant))=Value3dB FALL=last
.op
Type here to search
ENG
18:43
26-01-2021


LTspice XVII - [AC2_lab2]
File View Plot Settings Simulation Tools Window Help
AC2_lab1.asc AC2_lab2 AC2_lab2.asc
V(vout_vedant)
42dB
35dB
28dB
21dB
14dB
7dB
0dB
-7dB
-14dB
-21dB
-28dB
-35dB
-42dB
1Hz
10Hz
100Hz
1KHz
10KHz
100KHz
1MHz
10MHz
x = 5.316KHz y = -14.773dB
Type here to search
ENG
18:44
26-01-2021





BW sim	BW calc
1.03959MHz	1.1364MHz

Your AC LAB 2 is approved: Inderjit Singh Dhanjal