Audit Course Session 8

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: 15/2/2021
Kindly upload your schematic & waveform images here, every 10 minutes, indicating your progress and intention to completion of WORK within time slot allotted

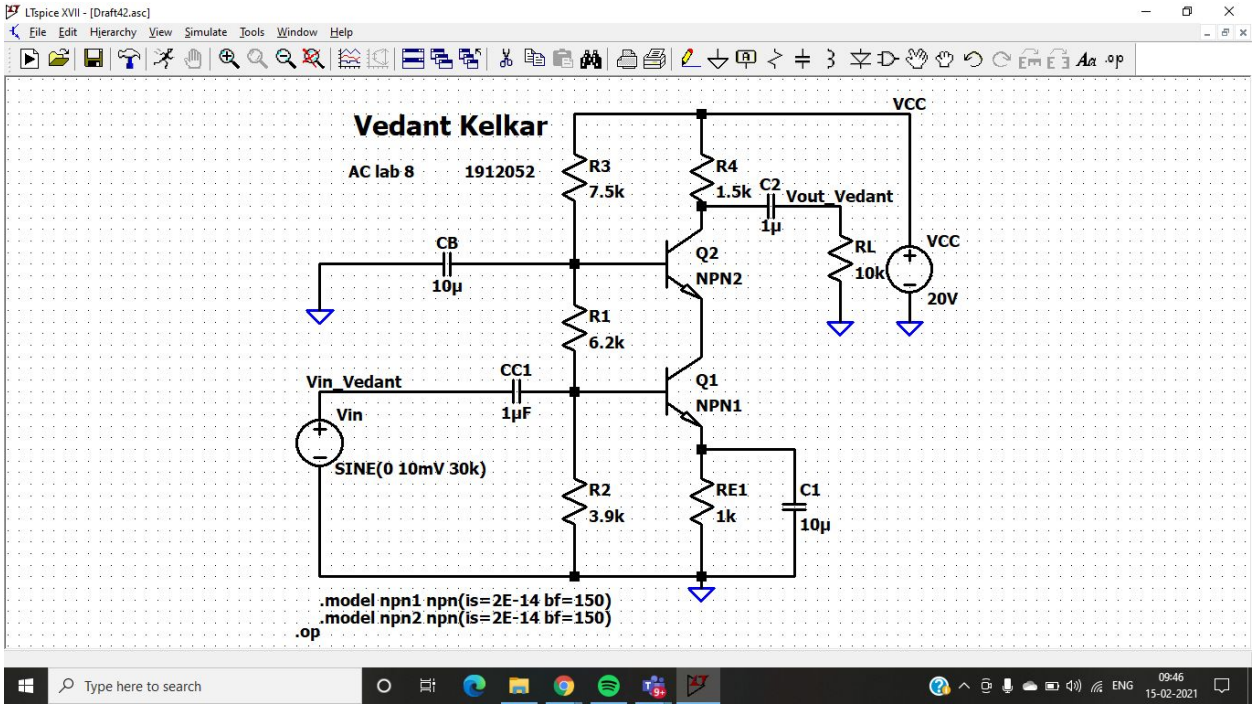
Time slot allotted to you all for the completion of Session 8 is 40 MINUTES

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

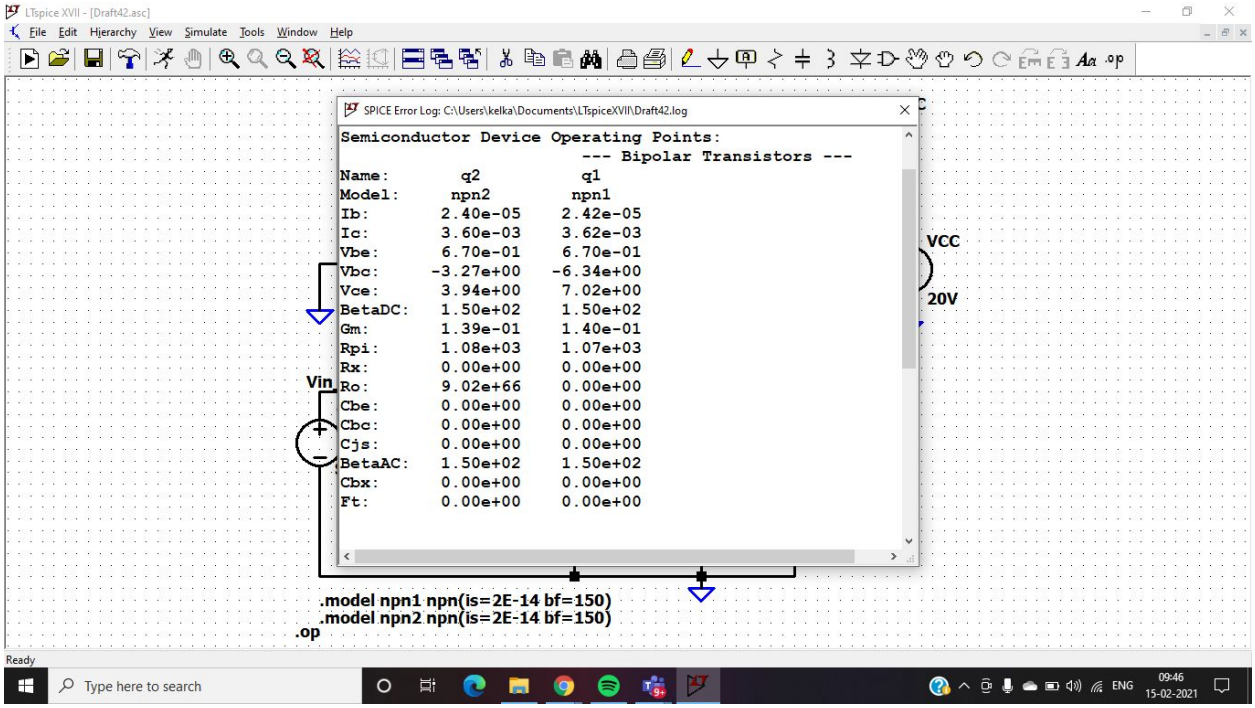
Follow these instruction strictly:
1, Start sharp ON TIME, by posting your name and roll no and **screenshot of your LT spice work screen (time and date MUST BE VISIBLE)**
2. Upload your work every 10 minutes, i.e LT spice work screen
3. This means you will upload LT spice work screen 4 times during this time slot.
4. Point 3 indicates your readiness and presences for completion of Session 8

You are entitled for 10 points per session only if you follow above instruction to the details

STUDENTS WORK AREA STARTS HERE

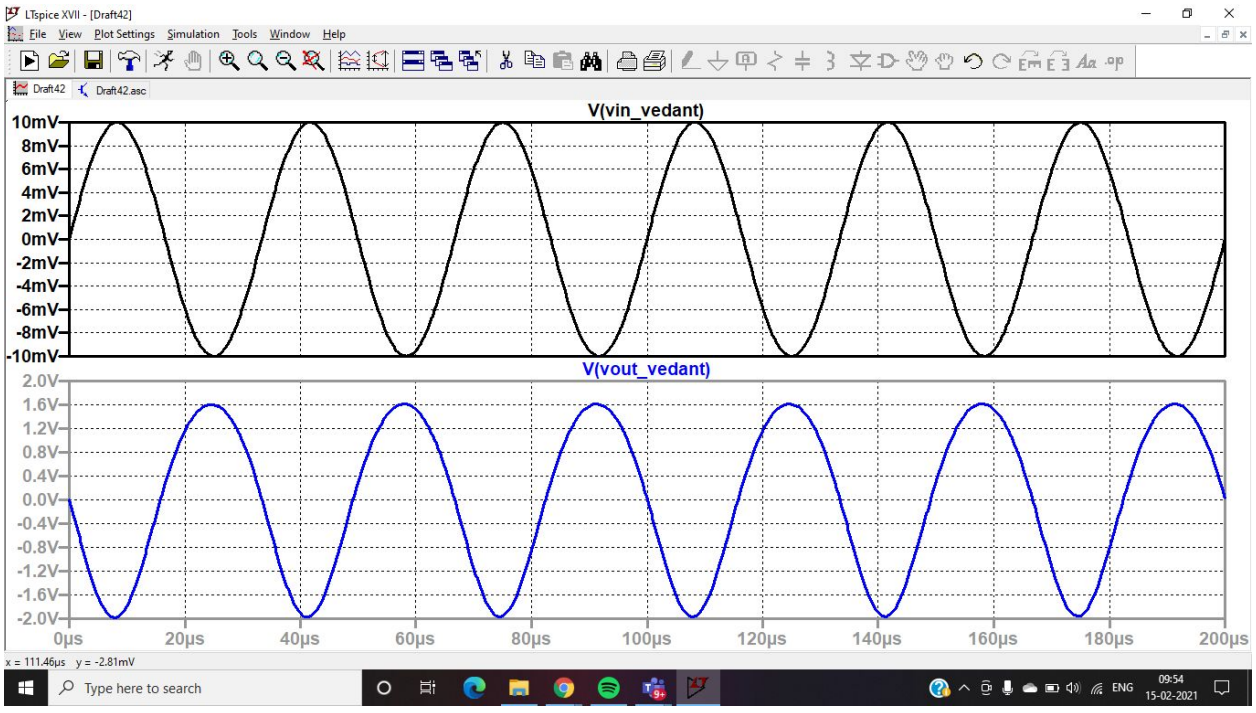

LTspice XVII - [Draft42.asc]
File Edit Hierarchy View Simulate Tools Window Help
Vedant Kelkar
AC lab 8
1912052
VCC
R3
7.5k
R4
1.5k
C2
1µ
Vout_Vedant
CB
10µ
Q2
NPN2
RL
10k
VCC
20V
R1
6.2k
CC1
1µF
Vin_Vedant
Vin
SINE(0 10mV 30k)
Q1
NPN1
R2
3.9k
RE1
1k
C1
10µ
.model npn1 npn(is=2E-14 bf=150)
.model npn2 npn(is=2E-14 bf=150)
.op
Type here to search
ENG
09:46
15-02-2021

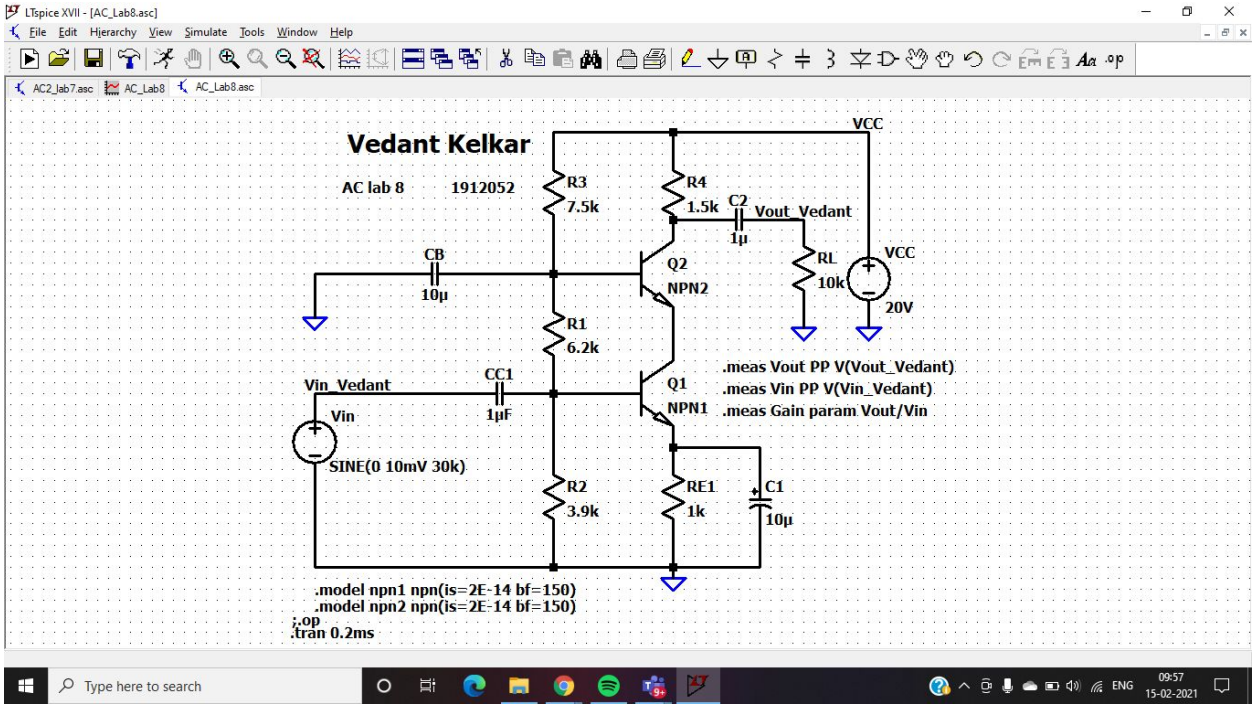
DC

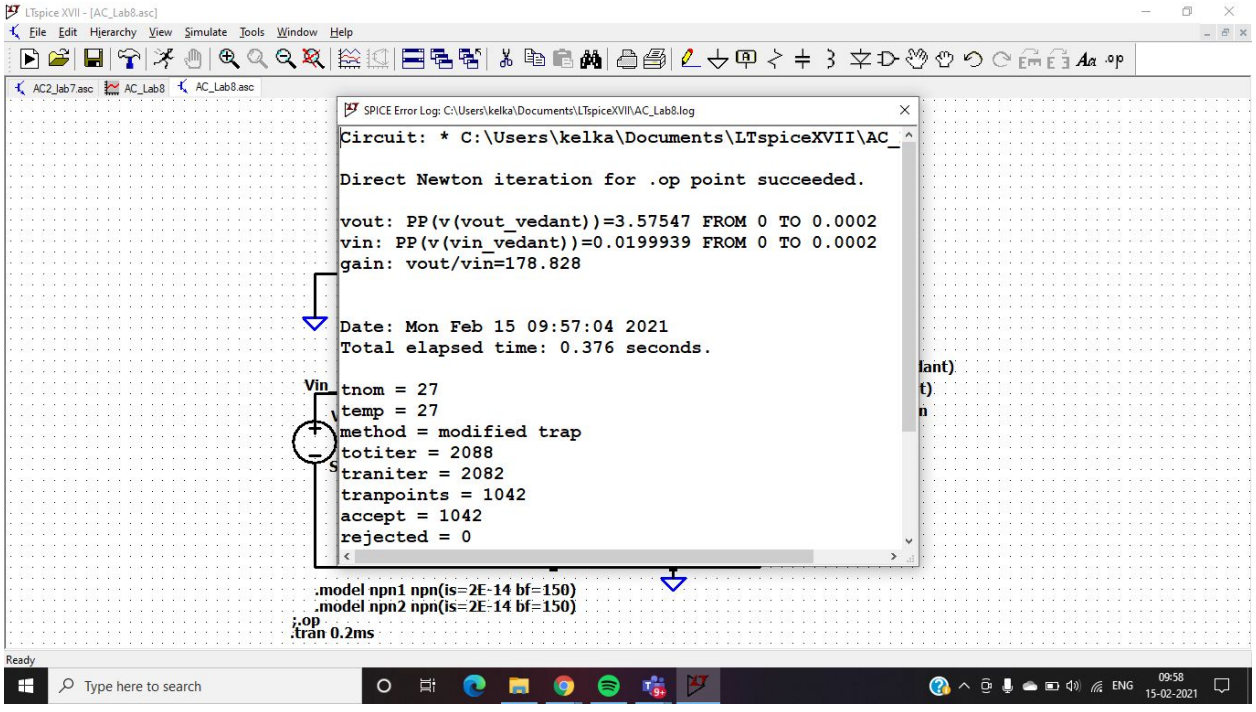

LTspice XVII - [Draft42.asc]
File Edit Hierarchy View Simulate Tools Window Help
SPICE Error Log: C:\Users\kelka\Documents\LTspiceXVII\Draft42.log
Semiconductor Device Operating Points:
--- Bipolar Transistors ---
Name: q2 q1
Model: npn2 npn1
Ib: 2.40e-05 2.42e-05
Ic: 3.60e-03 3.62e-03
Vbe: 6.70e-01 6.70e-01
Vbc: -3.27e+00 -6.34e+00
Vce: 3.94e+00 7.02e+00
BetaDC: 1.50e+02 1.50e+02
Gm: 1.39e-01 1.40e-01
Rpi: 1.08e+03 1.07e+03
Rx: 0.00e+00 0.00e+00
Ro: 9.02e+66 0.00e+00
Cbe: 0.00e+00 0.00e+00
Cbc: 0.00e+00 0.00e+00
Cjs: 0.00e+00 0.00e+00
BetaAC: 1.50e+02 1.50e+02
Cbx: 0.00e+00 0.00e+00
Ft: 0.00e+00 0.00e+00
VCC
20V
Vin
.model npn1 npn(is=2E-14 bf=150)
.model npn2 npn(is=2E-14 bf=150)
.op
Ready
Type here to search
ENG
09:46
15-02-2021

Ib	2.40e-05	2.42e-05
Ic	3.60e-03	3.62e-03
Vbe	6.70e-01	6.70e-01
Vbc	-3.27e+00	-6.34e+00
Vce	3.94e+00	7.02e+00
Beta DC	1.50e-02	1.50e-02
Gm	1.39e-01	1.40e-01
Rpi	1.08e-03	1.07e-03
Rx	0	0
Ro	9.02e+66	0

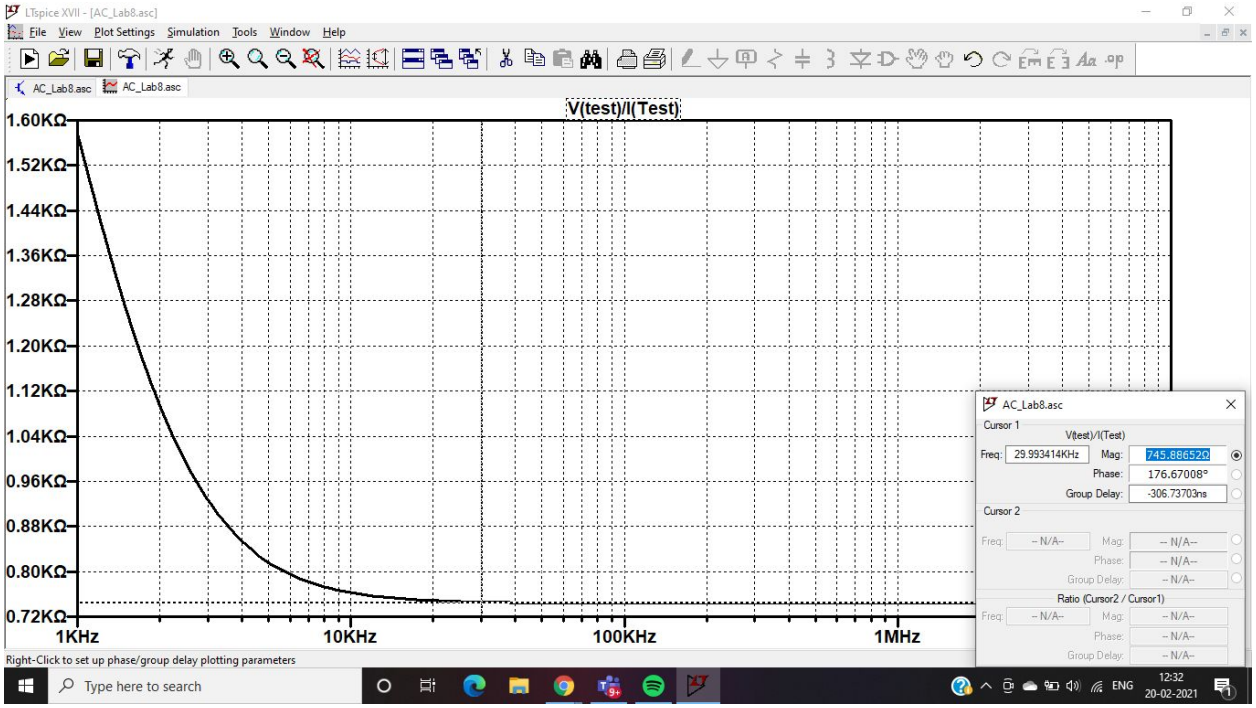
AC




LTspice XVII - [AC_Lab8.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab7.asc AC_Lab8 AC_Lab8.asc
Vedant Kelkar
AC lab 8 1912052
VCC
R3
7.5k
R4
1.5k
C2
1µ
Vout_Vedant
CB
10µ
Q2
NPN2
RL
10k
VCC
20V
R1
6.2k
.meas Vout PP V(Vout_Vedant)
.meas Vin PP V(Vin_Vedant)
.meas Gain param Vout/Vin
Vin_Vedant
CC1
1µF
Q1
NPN1
Vin
SINE(0 10mV 30k)
R2
3.9k
RE1
1k
C1
10µ
.model npn1 npn(is=2E-14 bf=150)
.model npn2 npn(is=2E-14 bf=150)
;.op
.tran 0.2ms
Type here to search
ENG
09:57
15-02-2021

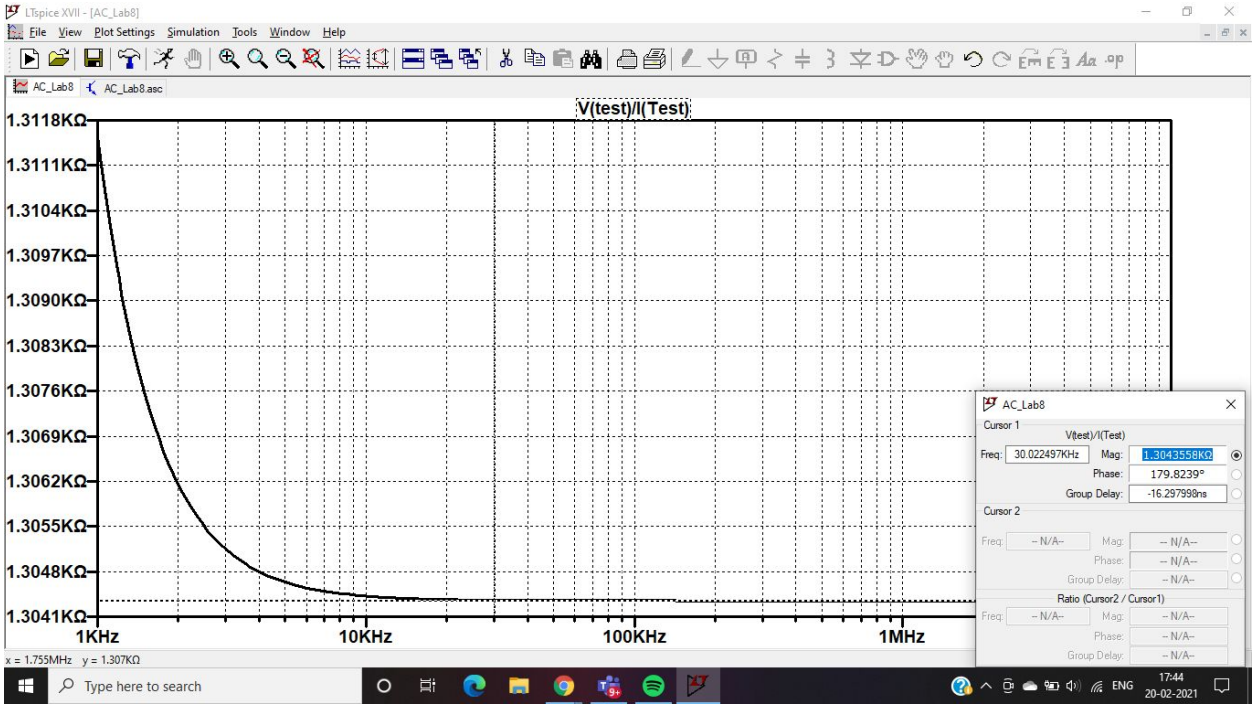

LTspice XVII - [AC_Lab8.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab7.asc AC_Lab8 AC_Lab8.asc
SPICE Error Log: C:\Users\kelka\Documents\LTspiceXVII\AC_Lab8.log
Circuit: * C:\Users\kelka\Documents\LTspiceXVII\AC_
Direct Newton iteration for .op point succeeded.
vout: PP(v(vout_vedant))=3.57547 FROM 0 TO 0.0002
vin: PP(v(vin_vedant))=0.0199939 FROM 0 TO 0.0002
gain: vout/vin=178.828
Date: Mon Feb 15 09:57:04 2021
Total elapsed time: 0.376 seconds.
tnom = 27
temp = 27
method = modified trap
totiter = 2088
traniter = 2082
tranpoints = 1042
accept = 1042
rejected = 0
.model npn1 npn(is=2E-14 bf=150)
.model npn2 npn(is=2E-14 bf=150)
;.op
.tran 0.2ms
Ready
Type here to search
ENG
09:58
15-02-2021

Zin



745.88652Ohm

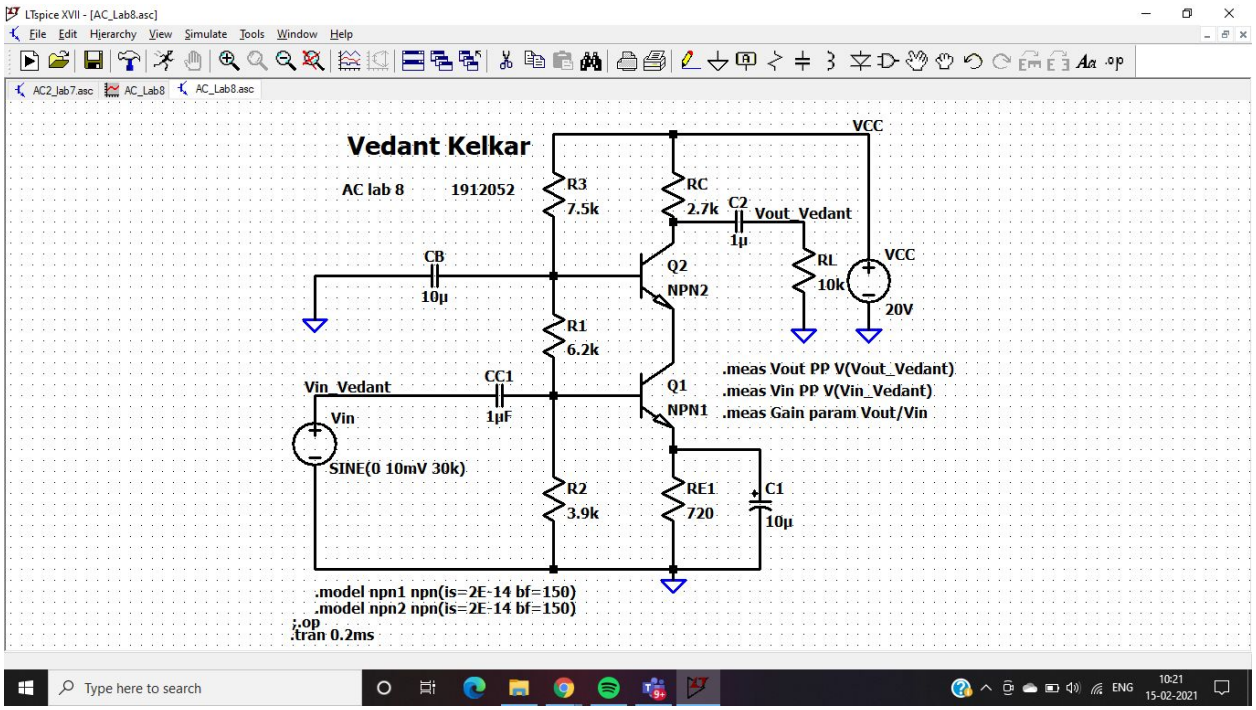
Zout



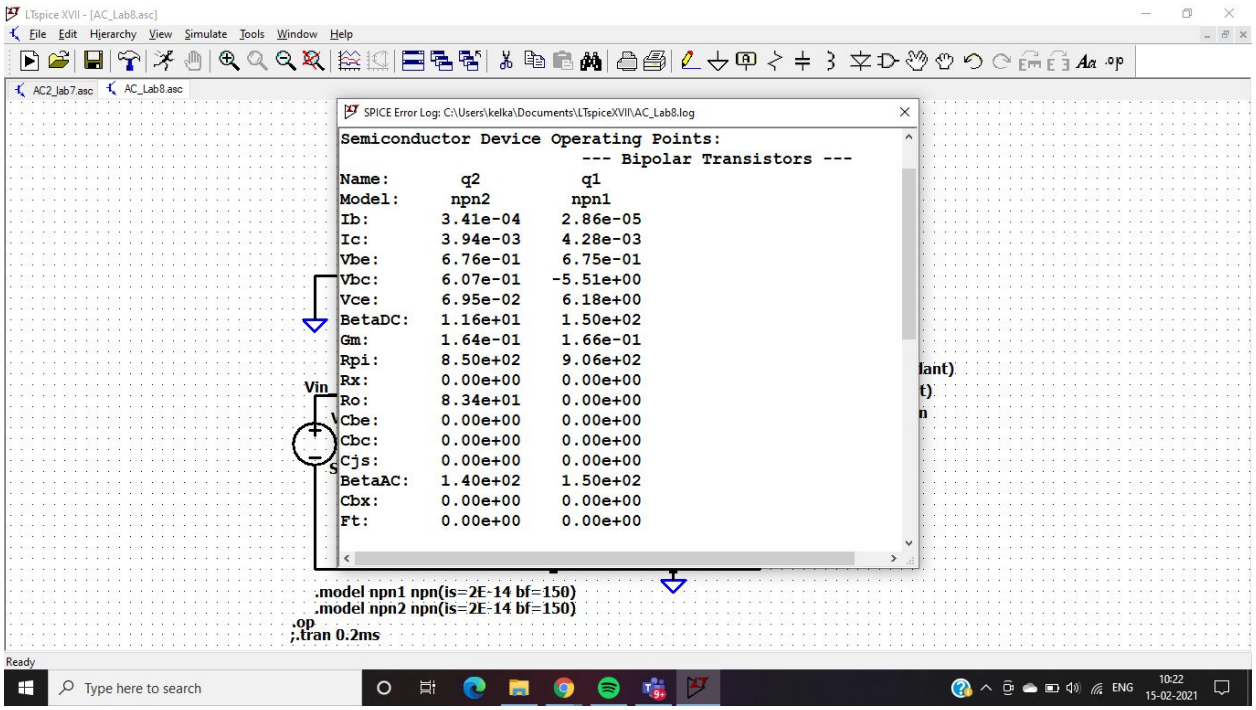
1.3043558KOhm

Zin	Zout
745.88652Ohm	1.3043558KOhm

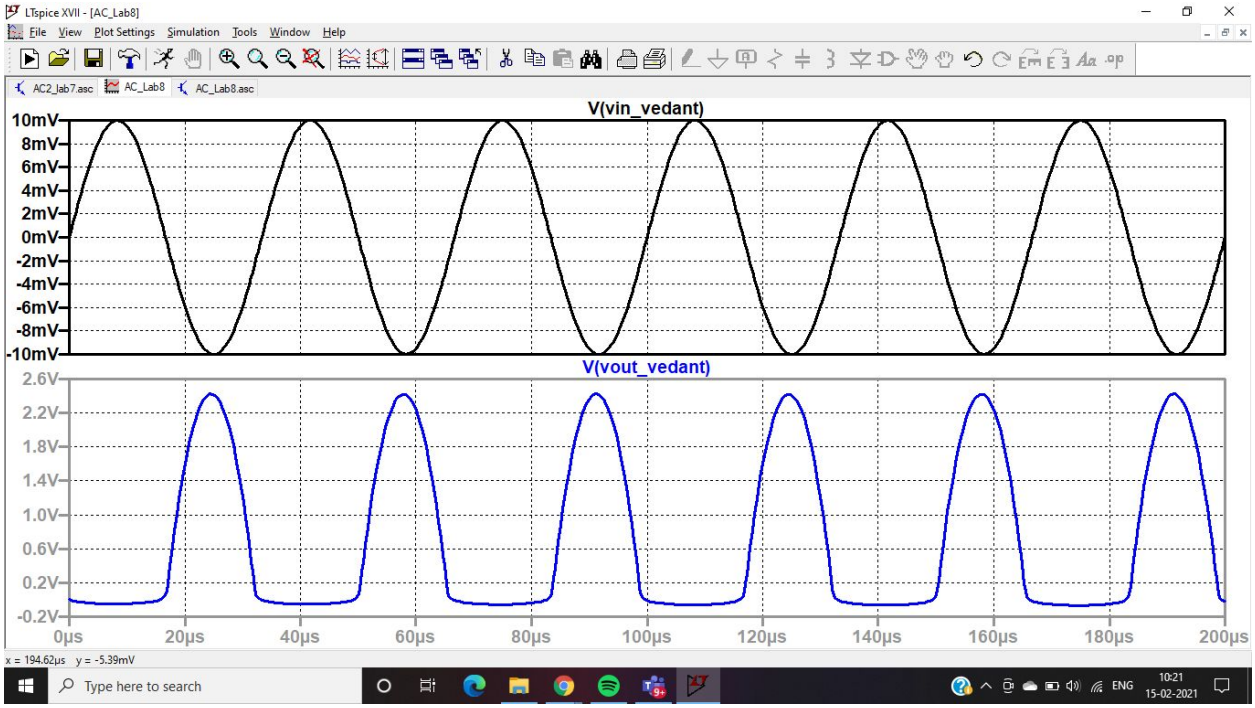
EX2

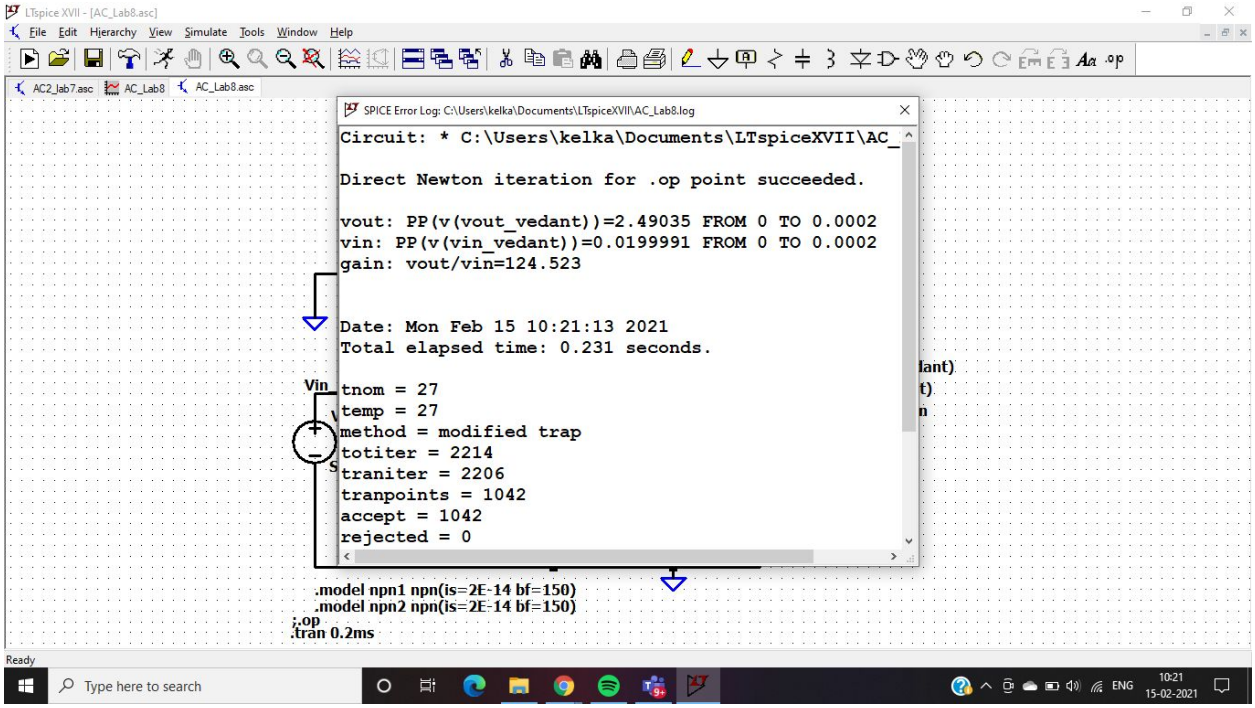

LTspice XVII - [AC_Lab8.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab7.asc AC_Lab8 AC_Lab8.asc
Vedant Kelkar
AC lab 8 1912052
VCC
R3
7.5k
RC
2.7k
C2
1µ
Vout_Vedant
CB
10µ
Q2
NPN2
RL
10k
VCC
20V
R1
6.2k
.meas Vout PP V(Vout_Vedant)
.meas Vin PP V(Vin_Vedant)
.meas Gain param Vout/Vin
Vin_Vedant
CC1
1µF
Q1
NPN1
Vin
SINE(0 10mV 30k)
R2
3.9k
RE1
720
C1
10µ
.model npn1 npn(is=2E-14 bf=150)
.model npn2 npn(is=2E-14 bf=150)
;.op
.tran 0.2ms
Type here to search
ENG
10:21
15-02-2021

DC

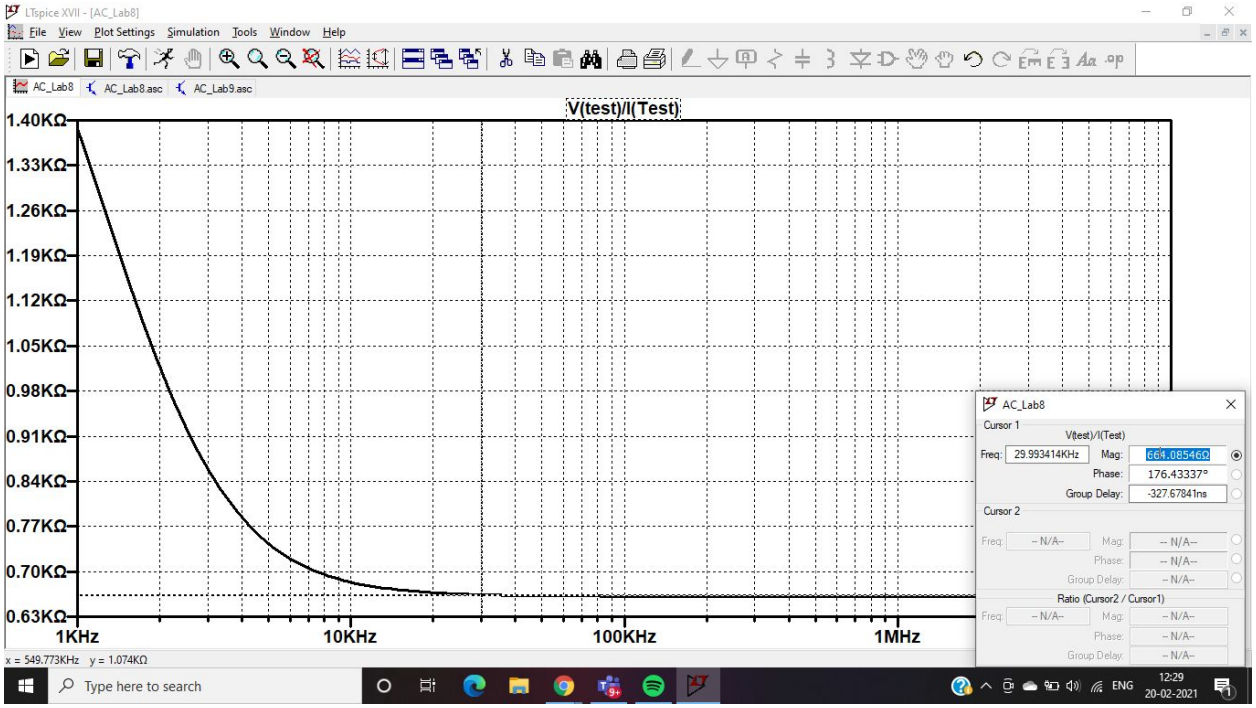

LTspice XVII - [AC_Lab8.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab7.asc AC_Lab8.asc
SPICE Error Log: C:\Users\kelka\Documents\LTspiceXVII\AC_Lab8.log
Semiconductor Device Operating Points:
--- Bipolar Transistors ---
Name: q2 q1
Model: npn2 npn1
Ib: 3.41e-04 2.86e-05
Ic: 3.94e-03 4.28e-03
Vbe: 6.76e-01 6.75e-01
Vbc: 6.07e-01 -5.51e+00
Vce: 6.95e-02 6.18e+00
BetaDC: 1.16e+01 1.50e+02
Gm: 1.64e-01 1.66e-01
Rpi: 8.50e+02 9.06e+02
Rx: 0.00e+00 0.00e+00
Ro: 8.34e+01 0.00e+00
Cbe: 0.00e+00 0.00e+00
Cbc: 0.00e+00 0.00e+00
Cjs: 0.00e+00 0.00e+00
BetaAC: 1.40e+02 1.50e+02
Cbx: 0.00e+00 0.00e+00
Ft: 0.00e+00 0.00e+00
Vin
.model npn1 npn(is=2E-14 bf=150)
.model npn2 npn(is=2E-14 bf=150)
.op
;.tran 0.2ms
Ready
Type here to search
ENG
10:22
15-02-2021

AC


LTspice XVII - [AC_Lab8]
File View Plot Settings Simulation Tools Window Help
AC2_lab7.asc AC_Lab8 AC_Lab8.asc
V(vin_vedant)
10mV
8mV
6mV
4mV
2mV
0mV
-2mV
-4mV
-6mV
-8mV
-10mV
V(vout_vedant)
2.6V
2.2V
1.8V
1.4V
1.0V
0.6V
0.2V
-0.2V
0µs 20µs 40µs 60µs 80µs 100µs 120µs 140µs 160µs 180µs 200µs
x = 194.62µs y = -5.39mV
Type here to search
ENG
10:21
15-02-2021

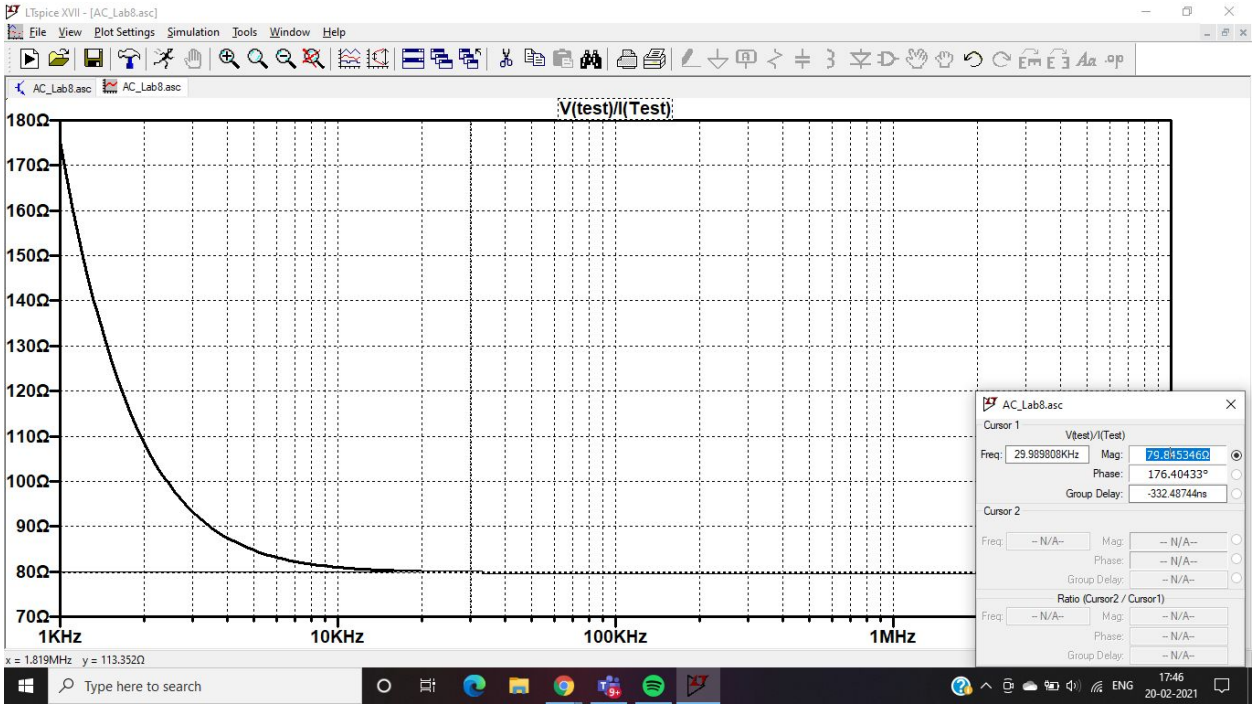

LTspice XVII - [AC_Lab8.asc]
File Edit Hierarchy View Simulate Tools Window Help
AC2_lab7.asc AC_Lab8 AC_Lab8.asc
SPICE Error Log: C:\Users\kelka\Documents\LTspiceXVII\AC_Lab8.log
Circuit: * C:\Users\kelka\Documents\LTspiceXVII\AC_
Direct Newton iteration for .op point succeeded.
vout: PP(v(vout_vedant))=2.49035 FROM 0 TO 0.0002
vin: PP(v(vin_vedant))=0.0199991 FROM 0 TO 0.0002
gain: vout/vin=124.523
Date: Mon Feb 15 10:21:13 2021
Total elapsed time: 0.231 seconds.
tnom = 27
temp = 27
method = modified trap
totiter = 2214
traniter = 2206
tranpoints = 1042
accept = 1042
rejected = 0
Vin
.model npn1 npn(is=2E-14 bf=150)
.model npn2 npn(is=2E-14 bf=150)
;.op
.tran 0.2ms
Ready
Type here to search
ENG
10:21
15-02-2021

Zin



664.08546Ohm

Zout



79.845346Ohm

Zin	Zout
664.08546Ohm	79.845346Ohm

Suggestions: Write inferences clearly, add observation table, Remove the part where Rc is 2.7k

AC LAB 8 is partially approved with suggestions: Inderjit Singh Dhanjal

AC LAB 8 is approved: Inderjit Singh Dhanjal