APC

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad – 500 043

LABORATORY WORK SHEET

Date: .....

Roll No: 20951A0444 Name: Mohammed Sohail

Exp No: 01 Experiment Name: Basic - Amplifiers

DAY TO DAY EVALUATION:

	Preparation	Algorithm / Performance in the Lab	Source Code / Calculations and Graphs	Program Execution / Results and Error Analysis	Viva	Total
Max. Marks	4	4	4	4	4	20
Obtained	4	4	4	4	4	20

Signature of Lab I/C

START WRITING FROM HERE:

Aim: To plot the frequency response of CE Amplifier and CB Amplifier, then calculate the gain, Bandwidth.

Software Required :- Multisim Analog Devices edition 13.0

Components and Equipments Required :-

S.NO	Apparatus	Range / Rating	Quantity
1.	CE Amplifier trainer Board with		
	DC power supply	12V	1
	DC power supply	5V	1
	NPN transistor	BC 107	1
	Carbon film resistor	100KΩ, 1/2W	1
	resistor	2.2KΩ, 1/2W	1
	(e) carbon film resistor	0.1 uf	2
	(f) capacitor		

2.	Cathode Ray oscilloscope	10-20) MHz	1
3.	Function Generator	0.1Hz - 10MHz	1
4.	BNC connector		2
5.	Connecting wires	5A	5

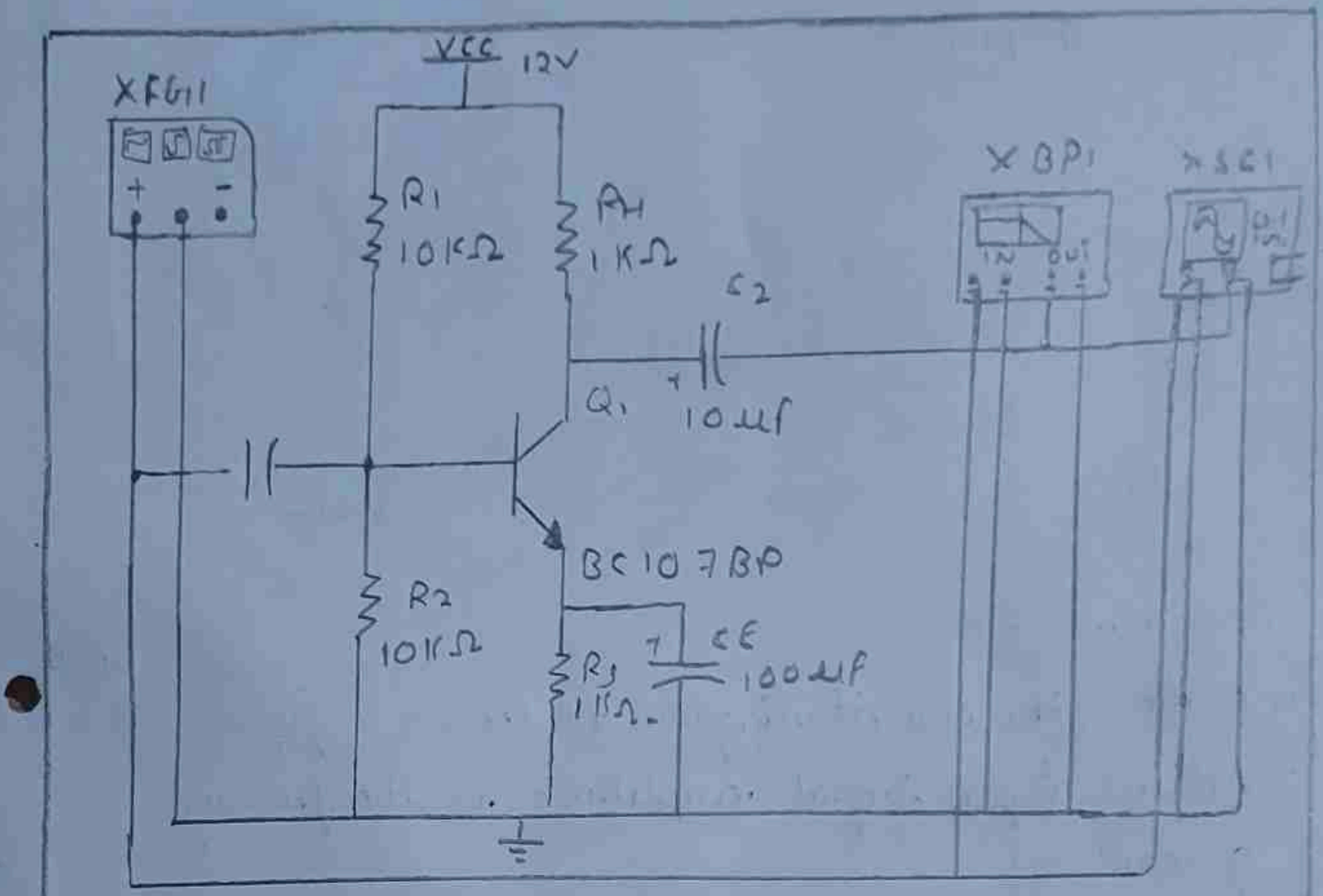
Theory:-

The CE amplifers provides high gain and wide frequency response. The Emitter lead is common to both i/p and o/p ckt and is ~~from~~ grounded

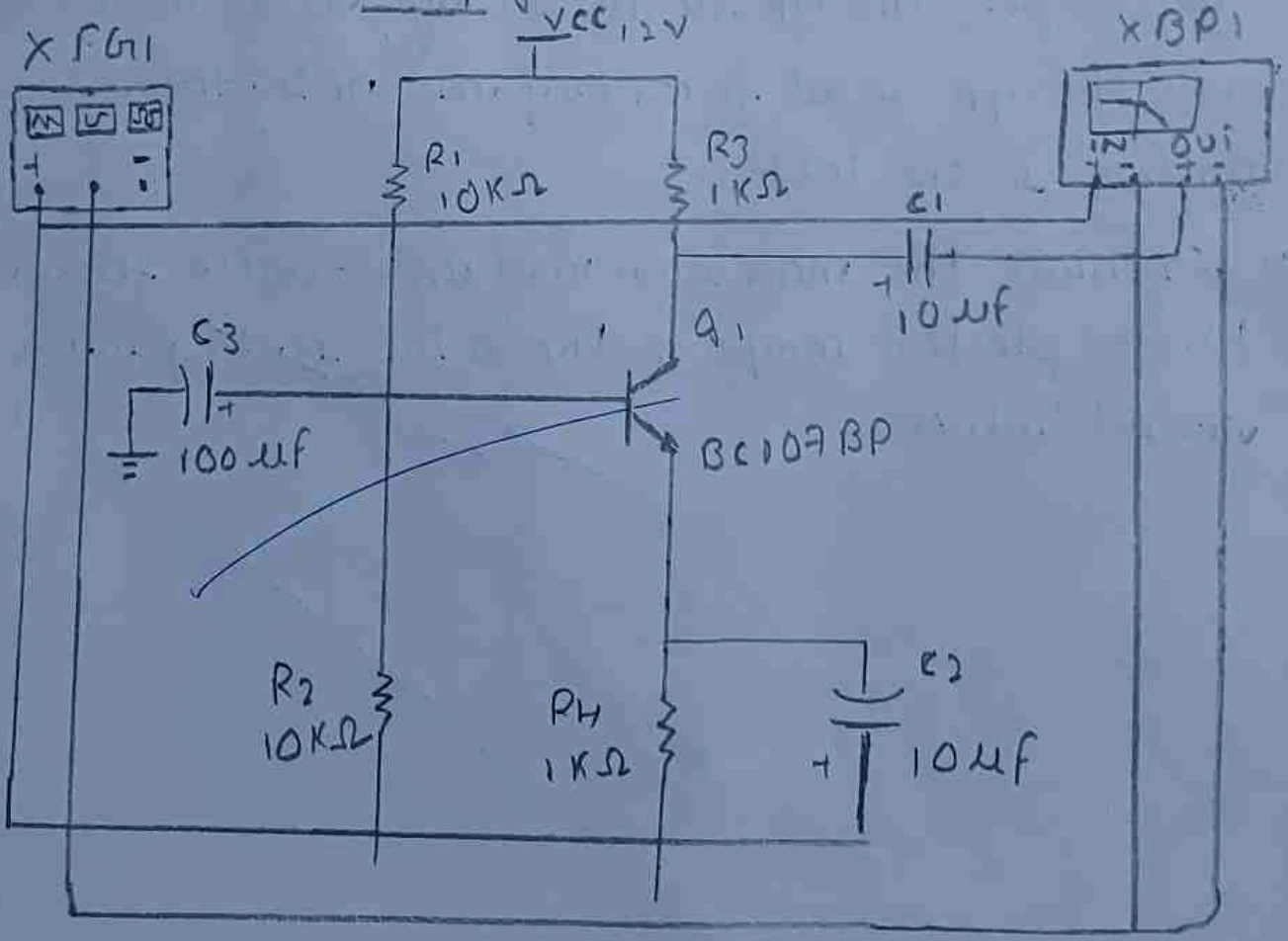
At low frequencies the reactance of coupling capacitor CC is quite high and hence very small part of signal will pass through from one stage to the next stage.

At high frequencies the reactance of inter electronic capacitance is very small and behaves as a short circuit.

At mid frequencies the effect of coupling capacitors is negligible and acts like short circuit where as inter electrode capacitors acts like open circuit.

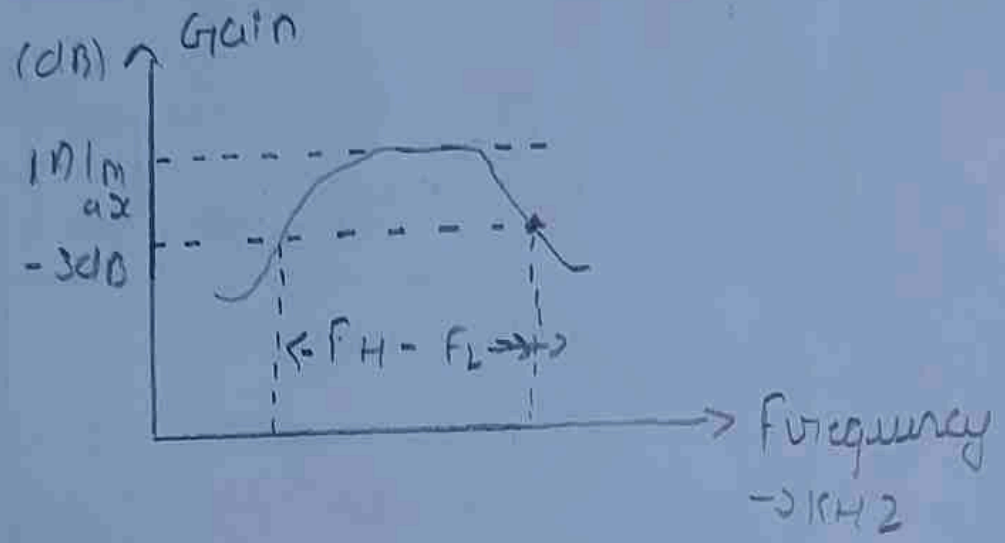


CE Amplifer



CB AMPLIFER

Expected Graph:-



Procedure:-

1. connect the circuit diagram as shown in figure
2. Adjust input signal amplitude in the function generator.
3. By keeping the i/p signal voltage at 50mv and vary the i/p signal frequency and note down the reading in the table.
4. Calculate the max gain and Band width using bode plotter compare the value with pratical circuit value.

Frequency	Gain in dB $20\log_{10}\left[\frac{V_0}{V_i}\right]$
20 Hz	21.4 dB
70 Hz	32.19 dB
100 Hz	35.02 dB
236.07 Hz	40.61 dB
273.03 Hz	41.29 dB
293 Hz	41.594 dB
365 Hz	42.371 dB
741 Hz	43.74 dB
800 Hz	43.821 dB
1K Hz	44.004 dB

Frequency	gain in dB
6K Hz	44.29 dB
163 K Hz	44.3 dB
1 M Hz	44.268 dB
12 M Hz	44.078 dB
26 M Hz	43.665 dB
30 M Hz	45.08 dB
40 M Hz	42.3 dB
52 M Hz	41.29 dB
62 M Hz	40.80 dB
113 M Hz	35.78 dB

Result:-

Frequency response of CE Amplifier is plotted

Gain:

$A_V = 44.3$ dB

Bandwidth:-

$f_M = 52.0$ MHz ; $f_Z = 113.2$ MHz

$BW = 61.2$ MHz

Semi-log paper (5cycles x 1/10")