APC

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad – 500 043

LABORATORY WORK SHEET

Date: 29.03.2022

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Exp No: 04 Experiment Name: Feedback 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:- Concepts of Feedback and need for feedback in amplifiers.

2. Measure current shunt feedback amplifier circuit with and without capacitor.
3. Voltage Series feedback amplifiers.
4. Determine frequency response for Voltage Series with and without feedback amplifiers.
5. Draw frequency response current shunt with and without capacitor is plotted.
6. Determine maximum gain and bandwidth using bode plotter.

Equipment needed:-

Hardware Requirements

1. Analog Discovery 2. Instrumen

2. personal computer
3. Trainer Kit
4. Connecting jumper and connecting wires

Software Requirements :-

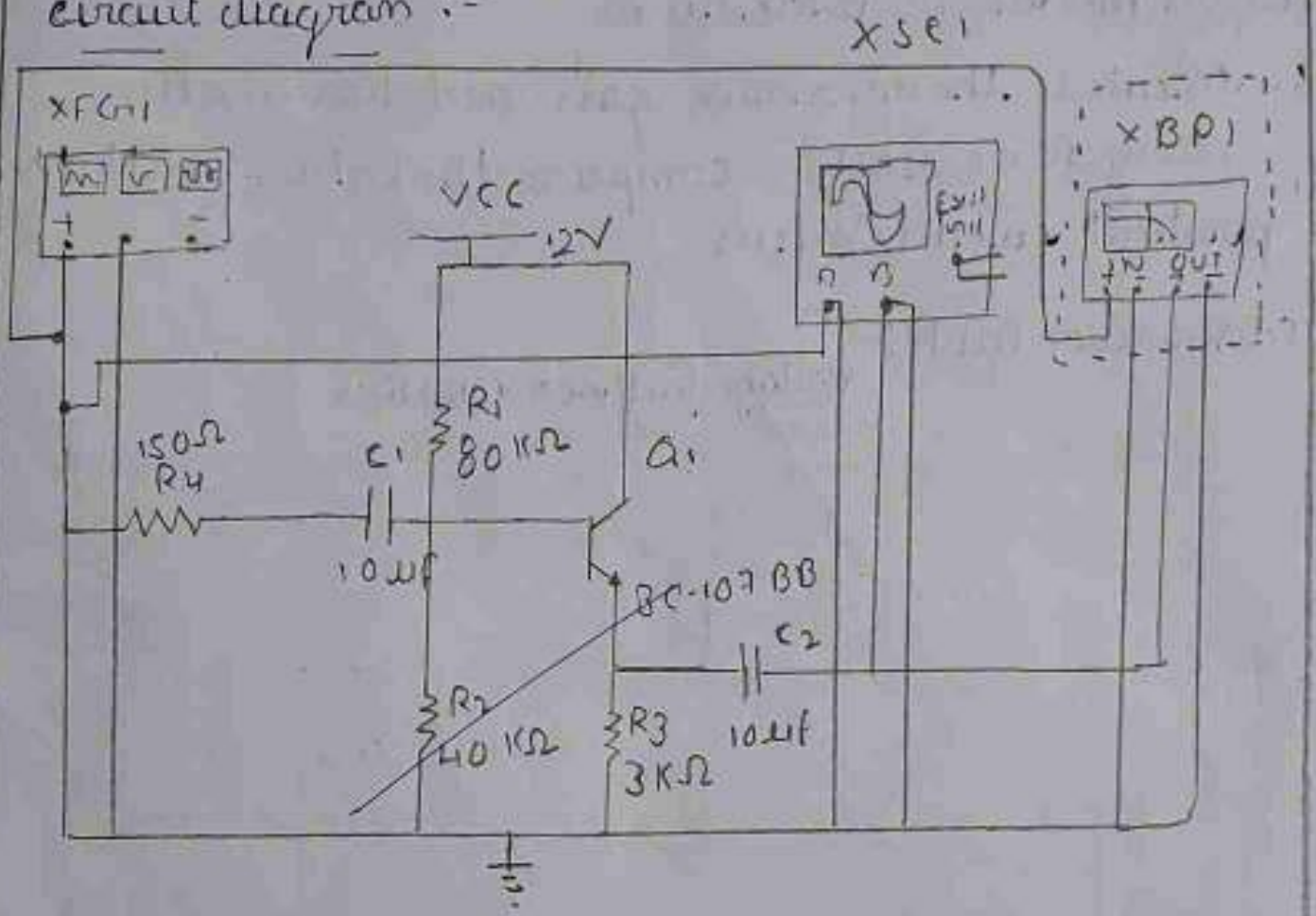
1. Multisim software 14.0 edition.
2. Waveform generator software

Theory :-

Feedback plays a very important role in electronic circuit and the basic parameters, such as input impedance, output impedance, current and voltage gain and bandwidth, may be altered considerably by the use of feedback for a given amplifier. A portion of the output signal is taken from the output of the amplifier and is combined with the normal input signal and thereby the feedback accomplished.

1. positive feedback
2. Negative feedback helps to increase the bandwidth, decrease gain, distortion, and noise, modify input and output resistance as desired A current shunt feedback amplifier circuit It is called a series - derived, shunt - fed feedback. The shunt connection as the input reduces the input resistance and the series connection at the output increases the output resistance

circuit diagram :-



Procedure

1. connect the circuit as shown in figure.
2. Adjust input signal amplitude in the function generator and observe an amplified voltage at the output without distortion.
3. By keeping input signal voltage, say at 50mv, vary the input signal frequency from 0-1 MHz as shown in tabular column and note the corresponding output voltage.
4. Save the circuit and simulate.
5. For current shunt feedback amplifier with shunt capacitor voltage series feedback amplifier

Repeat the above procedure

6. Calculate the maximum gain and bandwidth using Bode plotter. compare the values with the practical circuit values.

Observation table:-

Voltage feedback amplifier

Frequency: HZ	Gain in DB
10K	-51.898
50K	-37.919
100K	-21.401
500K	-17.993
1M	-12.189
4M	-3.046
8M	-1.183
12M	-0.719
18M	-0.542
30M	-0.454
50M	-0.337
100M	-0.345

current Voltage Feedback amplifier.

Frequency	Gain	
	without capacitor	with capacitor
10H3	-27.037	-23.745
20H3	-21.069	-13.293
40H3	-15.067	-3.508
60H3	-11.839	4.22
100H3	-7.074	13.298
200H3	-1.17	25.174
400H3	4.446	36.134
600H3	7.295	40.484
800H3	9.132	42.156
1KH3	10.324	43.785

2KHz	12.589	43.3
3KHz	13.141	43.341
5KHz	13.472	43.367
10KHz	13.631	43.373
40KHz	13.677	43.348
100KHz	13.676	43.144
400KHz	13.679	41.101
800KHz	13.643	37.632
1MHz	13.621	36.078
3MHz	13.151	27.413
6MHz	12.382	22.414

Calculations

->Voltage series feedback

Gain Amax = 20.337

-3dB gain = -0.337 - 3dB

= -3.337dB

->For current shunt without capacitor

Gain |A|max = 13dB

-3dB gain = 13-3dB

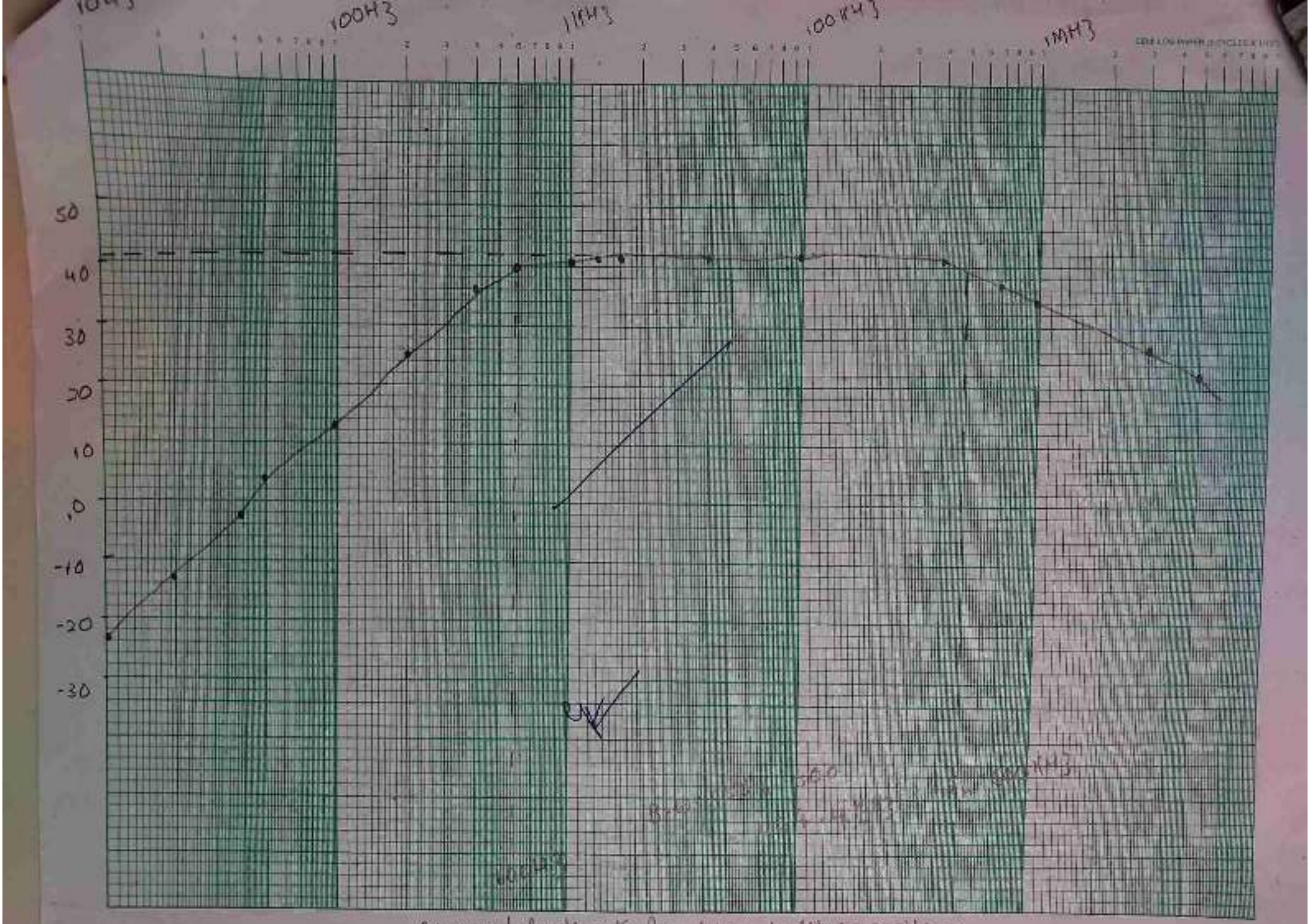
= 10.dB

->For current shunt with capacitor

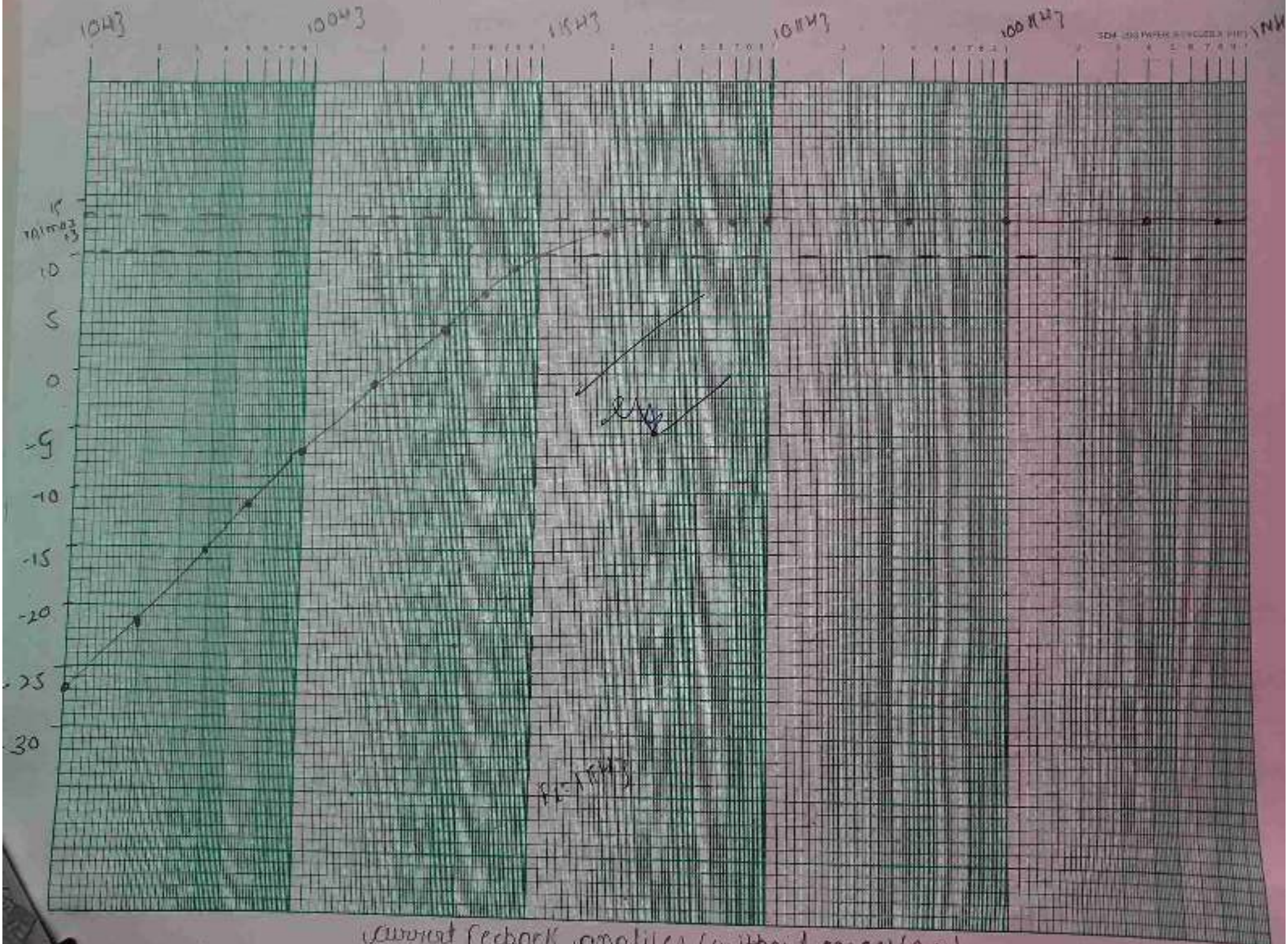
Gain |A|max = 43dB

-3dB gain = 43-3dB = 40dB

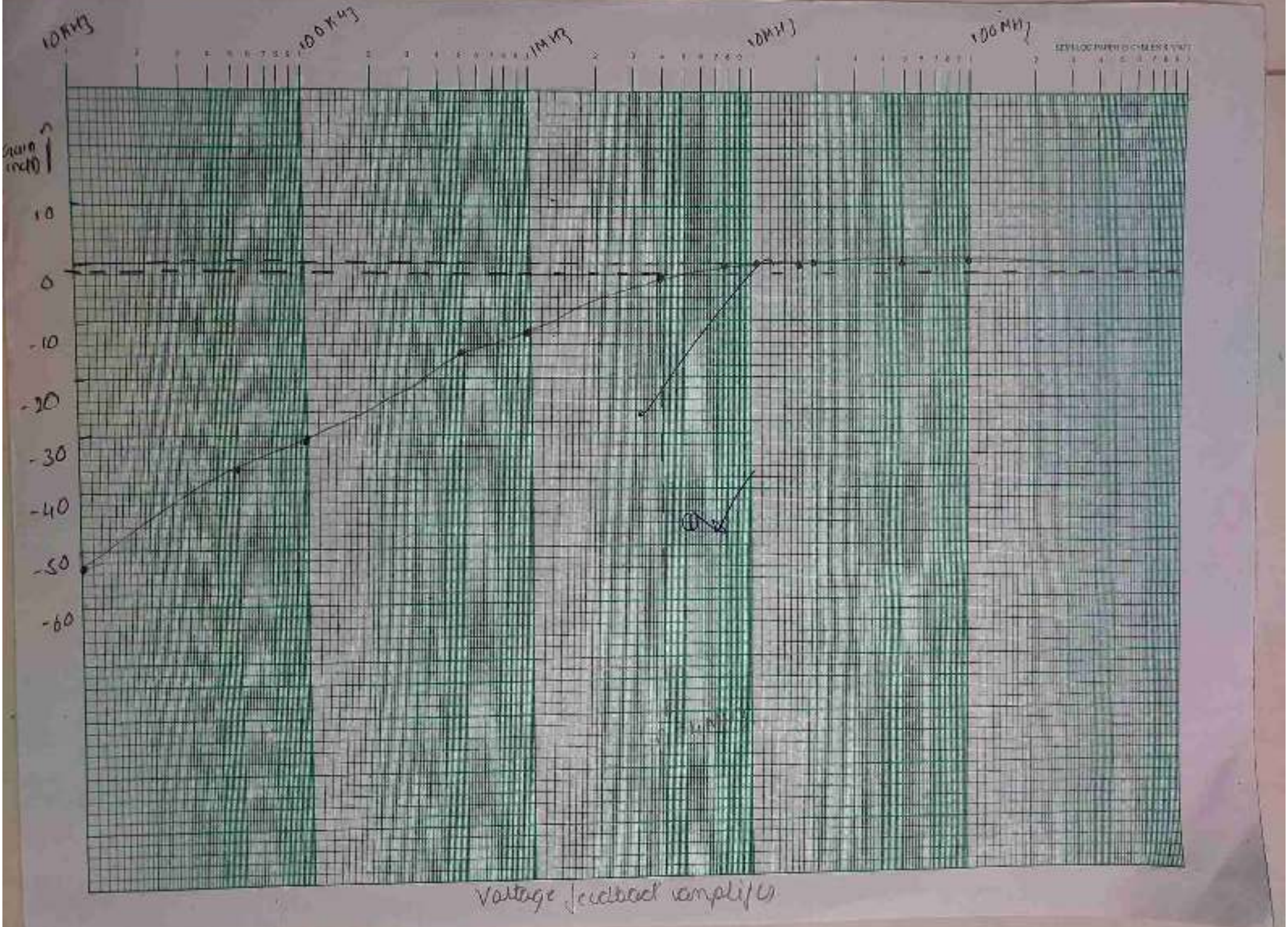
Result:- plotted graph the frequency response of feedback amplifier



Current feedback Amplifier (with capacitor)



current feedback amplifier (without capacitor)


10KHz
100KHz
1MHz
10MHz
100MHz
10
0
-10
-20
-30
-40
-50
-60
Voltage feedback amplifier