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Faculty of Engineering
Electrical and Electronics Engineering

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EEM 303 Electronic II Laboratory 6

Frequency Response of Amplifiers

Student Name	Student ID	Group Number
1.		
2.		
3.		
4.		

Objective:

To understand the frequency response of amplifiers

Equipment will be available at the laboratory:

DC power supply, Oscilloscope, Electronic Training Set(Y-0016), Patch wires,

Equipment will be ensured by students:

Digital Multi-Meter, Calculator

Preliminary Work:

Read the laboratory sheets. There might be a test or classical exams in the beginning of each laboratory hour. Questions will be asked mostly from *Supplementary Information* and *Procedure* sections.

The frequency response of JFET amplifiers should be briefly summarized and documented into A4 paper and given to instructor(s) at beginning of laboratory hour.

Procedure:

1. Turn on the oscilloscope and calibrate it,
2. Make sure the amplitude and frequency potentiometer of Function Generator adjusted to minimum, then, turn on the Training Set and connect the 'OUTPUT' to first channel of the oscilloscope,
3. Adjust the frequency to 1kHz and peak to peak voltage ($V_{i_{pp}}$) to $100\ mV$
4. Power off the Training Set and Oscilloscope,
5. Insert the Y-0016-0011 module into training set.
6. Connect the patch wires to the module as it is shown in Figure 1.
7. Turn the power on for Y-0016 Training Set.

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8.   Measure the input signal's peak to peak voltage ($V_{i_{pp}}$) and its frequency f_i.

9.   Measure the output signal's peak to peak voltage ($V_{o_{pp}}$) and its frequency f_o.

10. Record measured values in the Table 1.

11. Repeat the procedure 8 to 10 for the frequency values stated in the Table 1,

12. Calculate the output gain A_V for all frequency values.

13. Calculate each voltage gain in decibel ($A_{V\,dB}$) via equation below,

$$A_{V\,dB} = 20\log_{10} A_V$$

Bandwidth Measurement

14. Obtain lower cutoff frequency corner f_{Lc} and higher cutoff frequency corner f_{Hc} by adjusting frequency to a certain level that make 3dB decrement from the maximum gain.

15. Calculate the bandwidth with respect to the frequency response.
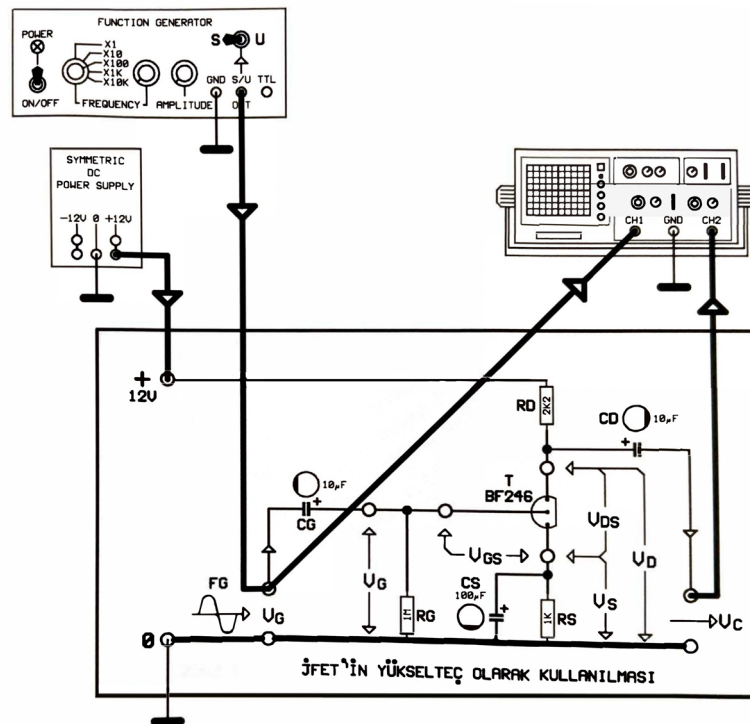

Figure 1: Connection scheme of JFET frequency response circuit.

Results:

Table 1: Frequency response measurements.

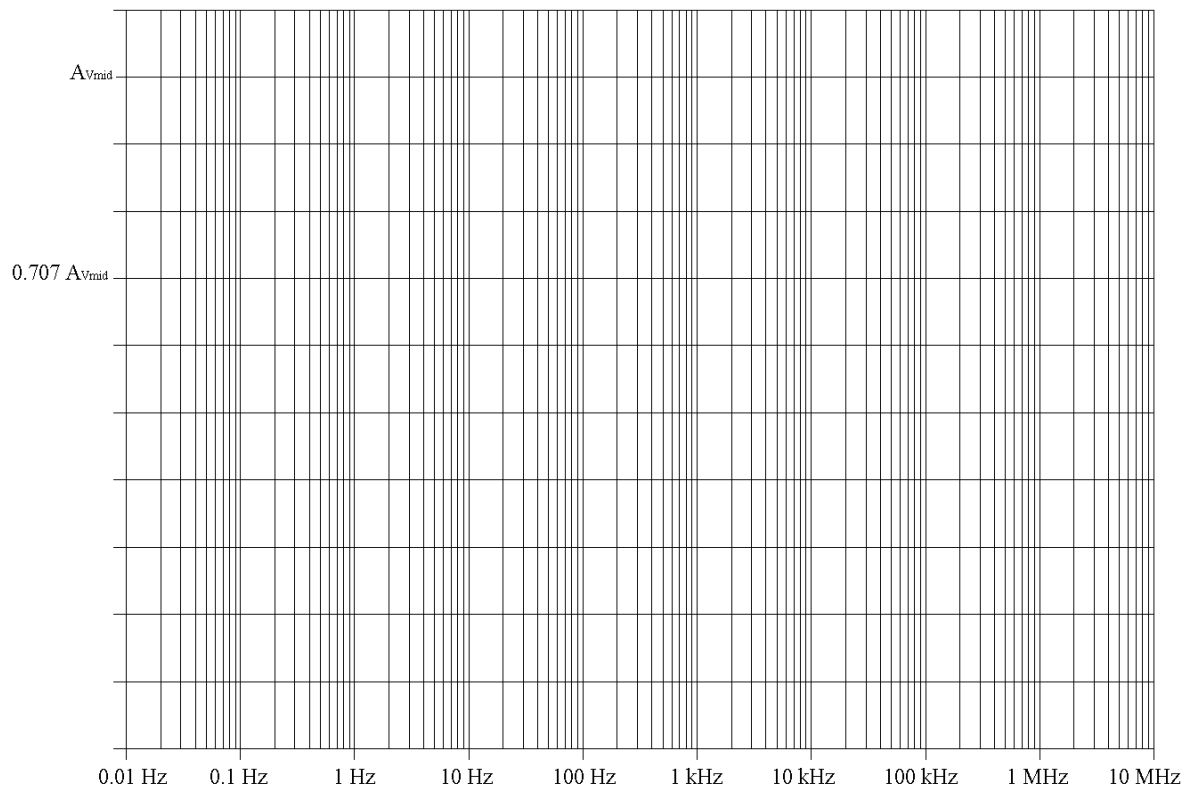| f_i	0.01 Hz	0.1 Hz	1 Hz	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz	10 MHz
f_o										
$V_{i_{pp}}$										
$V_{o_{pp}}$										
A_V										
$A_{V_{dB}}$										

Figure 5: The log-magnitude plots of output gain A_V.

Bandwidth Measurement

$f_{Lc} =$	$f_{Hc} =$	$BW = f_{Hc} - f_{Lc} =$

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Conclusion: