EEO352 Lab 2

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TABLE I
SCORING TABLE

Item	Credit	Score
Low-pass or High-pass Filter		
Circuit Diagram with Values of Components	1	
Measured and Calculated Frequency Plot; -3dB Point	3	
Transient, Time Response	1	
Diodes		
I-V Plot	2	
Curve Fitting; IS, η	3	
Total	10	

***Abstract*—The abstract is a short summary of the main ideas found in the lab report. It should include 1) the purpose of the study or the question being addressed by the study, 2) the procedures used in the study, 3) the major results of the study, and 4) any conclusions drawn by the author(s).**

I. Circuit Design

A Low Pass Filter (LPF) shall be designed with a cutoff frequency around 20kHz +/-20%.

The equation for a first-order low-pass filter is given by:

$$f_c = \frac{1}{2\pi RC} \qquad \text{(LPF Cutoff Frequency)}$$

where R is resistance, C is the capacitance, and f_c is the cutoff frequency.

The equation for resistance (R) is given by:

$$R = \frac{1}{2\pi C f_c} \qquad \text{(LPF Resistance)}$$

From the available capacitors in our kit I select 4700pf.

Solving for (R) we have:

$$R = \frac{1}{2\pi 4700pF \cdot 20kHz}$$

$$R = 1692.58\,\Omega$$

Selecting the nearest standard value ($1.7\,\mathrm{k\Omega}$) we solve for frequency:

$$f_c = \frac{1}{2\pi 1k7 \cdot 4700pF}$$

$$f_c \approx 19\,827.51\,\mathrm{Hz}$$

The percent difference between $19\,827.51\,\mathrm{Hz}$ and $20\,000\,\mathrm{Hz}$ is approximately

$$\left| \frac{19\,827.51\,\mathrm{Hz} - 20\,000\,\mathrm{Hz}}{\frac{19\,827.51\,\mathrm{Hz} + 20\,000\,\mathrm{Hz}}{2}} \right| \times 100\% \approx 0.864\,\%.$$

Which is within the 20% requirement so we can proceed.

II. Data

III. analysis

IV. conclusion