Laboratory Project 1b: Electromyogram Circuit
Report Contents and Grading

30		***Communication***
	–	IEEE single column, double spaced format, title, author, etc. (–20 pts if not used)
	5	Style (written in the style of article, rather than disjointed figures and tables)
	5	English (grammar, punctuation, and etc.)
	5	Clarity (purpose of each section clearly explained)
	3	Succinctness and precise wording (detailed information in as few words as possible)
	3	Organization (ease of locating figures/code/equations/etc.)
	3	Section numbers and headings (use section numbers shown below)
	3	Equations explained (at least one sentence between equations)
	3	Figures complete (every figure numbered, captioned, and referred to in text)
5		***Abstract*** (succinct summary of results, including numerical values as appropriate)
10	**I.**	**INTRODUCTION**
	8	Motivation/background for lab [create EMG circuit, useful for medical diagnostics]
	2	State report organization [briefly describe contents of sections that follow]
10	**II.**	**PRE-AMP DESIGN, TEST, AND CONSTRUCTION** (Lab 1b Section IV and V)
		A. *Electrode model and pre-amp model*
	1	Introduce section [to demonstrate need for pre-amp to drive diff-amp]
	1	Explain model of electrode [small v-source in series with 1 MΩ]
	1	Describe why electrode driving diff-amp gives signal out ≈ 0 V [include Fig. 4a]
	1	Comment on test results from your Table II [data not required]
		B. *Pre-amp model*
	1	Explain model of pre-amp [small v-source in series with 10 Ω]
	1	Describe why pre-amp driving diff-amp gives signal out ≈ input [include Fig. 5a]
	1	Comment on test results from your Table III [data not required]
	1	Comment that pre-amp
		C. *Pre-amp circuit*
	1	Describe pre-amp circuit you built [include Fig. 6b, crop out LED's]
	1	Describe results of pre-amp tests in words
25	**IV.**	**DIFFERENTIAL AMPLIFIER DESIGN AND TEST** (Lab 1b Section VI, VII.A,B)
		A. *Analysis of differential amplifier*
	2	Describe differential amplifier circuit [Lab 1b Fig. 8]
	3	Give the formula for v_3 versus v_1 for v_2
	3	Give the formula for v_3 written in terms of v_{cm} and v_{dm}
	2	Give the formula for v_3 written in terms of $\Re=R_1/R_2=R_3/R_4$
	1	Explain that v_3 written in terms of $\Re$ is only a function of v_{dm}
	2	Explain why having v_3 be only a function of v_{dm} is desirable
		B. *Design of differential amplifier*
	3	Explain how resistor values were chosen
	4	List values of resistors used in diff-amp
		C. *Testing of differential amplifier*
	2	Describe testing procedure [include Lab 1b Fig. 11]
	3	Explain calculation of gain of diff-amp [= slope of plot] and list value of gain
15	**V.**	**EMG MEASUREMENT** (Lab 1b Section VIII)
		A. *Measurement of EMG*
	1	Explain how electrodes and oscilloscope connected for EMG
	5	Show plot of EMG from oscilloscope [use Matlab® to make plot]
		B. *Power vs weight for EMG signal*
	2	Explain how power for EMG calculated [Lab 1b Eqn (6)]
	5	Show plot of power vs weight
	2	Comment on plot [describe shape, possible measurement errors]
5		**CONCLUSION** (summarize key results; include numerical values as appropriate)