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Electronics II - Spring 1999 - Fourth Exam (C) - Prof. Manuel Toledo

1. A transistor is operating in an ideal class B amplifier with a  $1k\Omega$  load. A d.c. meter in the collector circuit reads an average current of 10 mA. How much signal power is being delivered to the load? (30 pts)

2. Design a third order high-pass Butterworth filter with cutoff frequency of 5 kHz. How much will 500 Hz signals be attenuated by this filter? The third order Butterworth polynomial is  $B_3(s) = (s + 1)(s^2 + s + 1)$ . Draw the circuit's schematic diagram. (30 pts)

3. Design a shunt regulator that will deliver 5 volts at 1.2 amperes from an unregulated 9 volts source with voltage regulation of 2 % and line regulation of 5 %. Specify the voltage, maximum current and internal resistance of the zener diode, and the value of the series resistor. (30 pts)