userid: _____

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Opamps are available with the following data sheet values:

V_{OS}	I_B	I_{OS}	R_D	R_C	R_O	f_t	A_o	I_{sc}	L_+	L_-
1 mV	1 μA	1 nA	1 MΩ	1 GΩ	75 Ω	1 MHz	200 k	10 mA	+ 14 V	- 14 V

where I_{sc} is the maximum current the opamp's output can supply.

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5% PVNS (Preferred Value Numbering Systems) list: 10, 11, 12, 13, 15, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 43, 47, 51, 56, 62, 68, 75, 82, 91.

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A limiter circuit circuit is required for a input signal from a 50 Ω output impedance sensor. The limiter should have a gain of $A_v = -30.5$, dropping to $A_v = -205m$ when the output voltages exceeds 2.80 volts and dropping to $A_v = -105m$ when the output voltages falls below -3.50 volts.

(a) Supply an input-output plot of the voltage gain function.

(b) Supply the circuit design using one general purpose opamp, resistors, signal diodes and a ± 15 V power supply.

(c) For the above circuit, what is the output voltage and opamp's output current when the input voltage is +10.0 V?

(d) For the above circuit, what is the output voltage and opamp's output current when the input voltage is -10.0 V?

(e) For the above circuit, what is the amplifier's input resistance?