

Issued: September 27, 2004

Due: October 4, 2004

1. Do Problem 8.27.
2. Do Problem 8.51.
3. Do Problem 8.52.
4. Do Problem 9.12.
6. Do Problem 9.15.

8.27 Find an expression for the output voltage in the circuit of Figure P8.27.

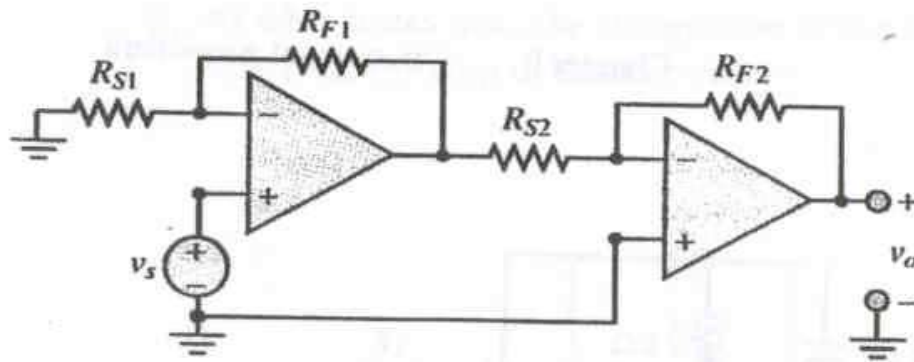
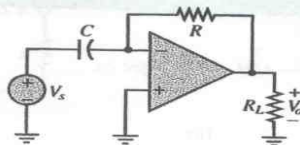


Figure P8.27

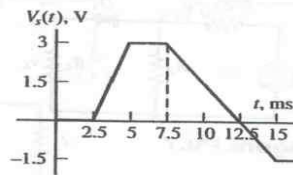
8.51 The circuit shown in Figure P8.51(a) will give an output voltage which is either the integral or the derivative of the source voltage shown in Figure P8.51(b) multiplied by some gain. If

$$C = 1 \mu\text{F} \quad R = 10 \text{ k}\Omega \quad R_L = 1 \text{ k}\Omega$$

determine an expression for and plot the output voltage as a function of time.



(a)



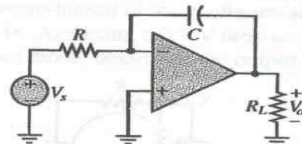
(b)

Figure P8.51

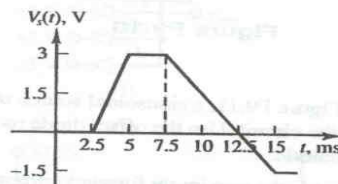
8.52 The circuit shown in Figure P8.52(a) will give an output voltage which is either the integral or the derivative of the supply voltage shown in Figure P8.52(b) multiplied by some gain. Determine

- An expression for the output voltage.
- The value of the output voltage at $t = 5, 7.5, 12.5, 15,$ and 20 ms and a plot of the output voltage as a function of time if

$$C = 1 \mu\text{F} \quad R = 10 \text{ k}\Omega \quad R_L = 1 \text{ k}\Omega$$



(a)



(b)

Figure P8.52

9.12 Determine which diodes are forward-biased and which are reverse-biased in each of the configurations shown in Figure P9.12.

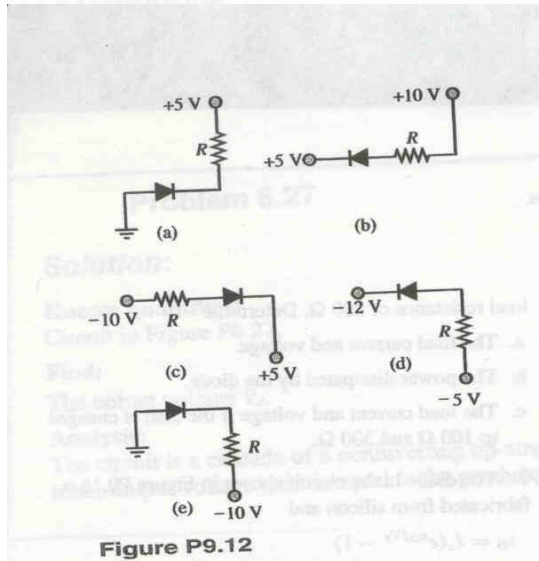


Figure P9.12

9.15 Sketch the output waveform and the voltage transfer characteristic for the circuit of Figure P9.15. Assume ideal diode characteristics, $v_S(t) = 10 \sin(2,000\pi t)$.

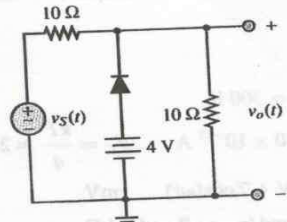


Figure P9.15

9.16 Repeat Problem 9.15, using the offset diode model with $V_\gamma = 0.6\text{ V}$.