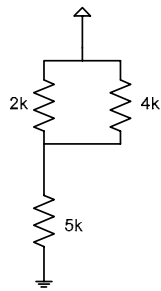
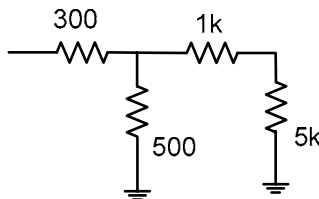


Tutorial I

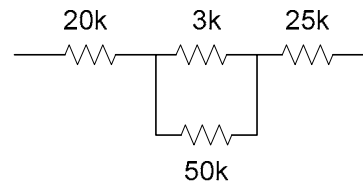
1) Determine the equivalent resistance of the following:



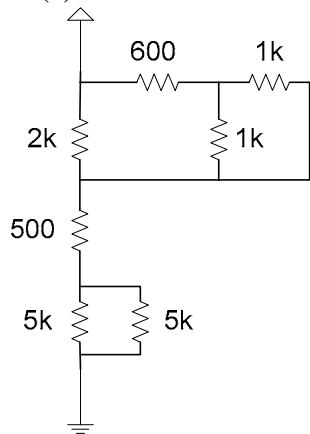
(a)



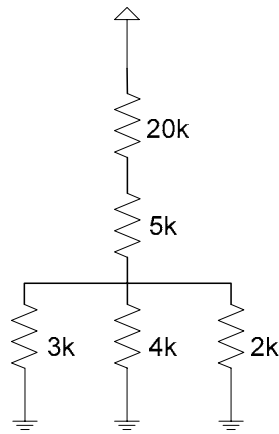
(b)



(c)

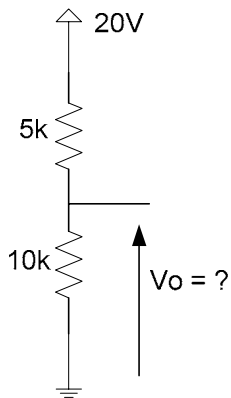


(d)

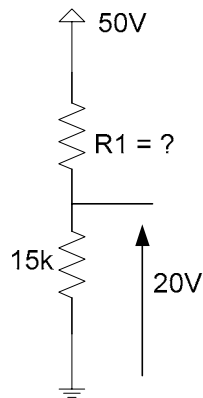


(e)

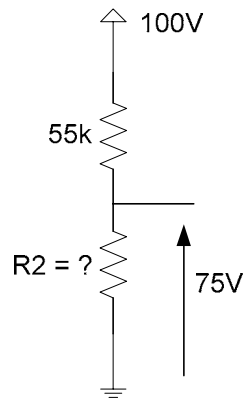
2) Calculate the missing value of the following voltage dividers:



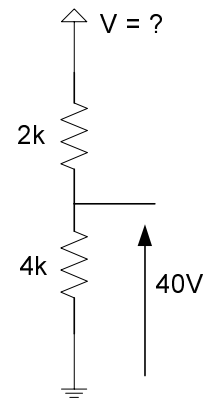
(a)



(b)

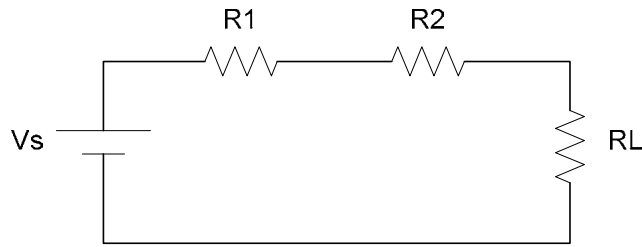


(c)

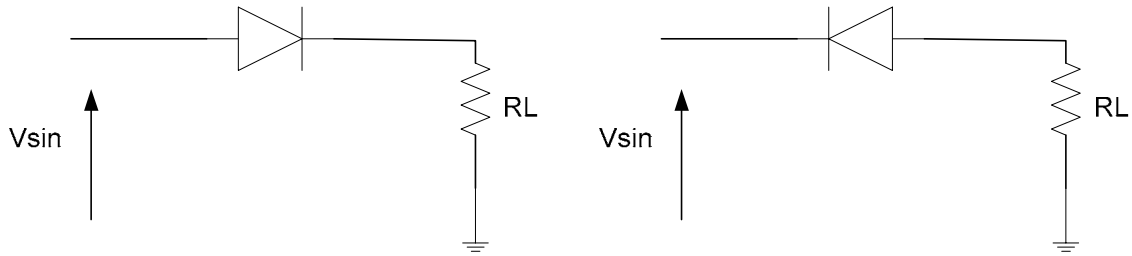


(d)

3) Given the circuit below indicate where you would place an ammeter and a voltmeter to measure the current and the voltage at the load.

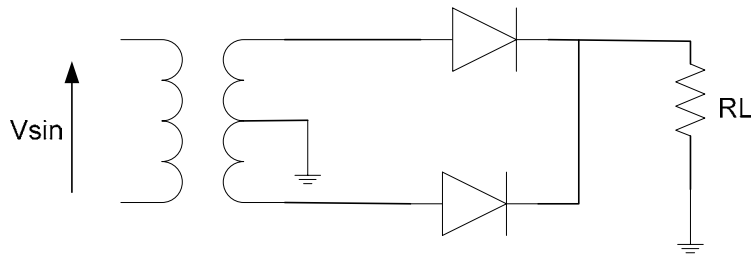


4) Assuming a sinusoidal input, draw the output you would expect from the following circuits.



(a)

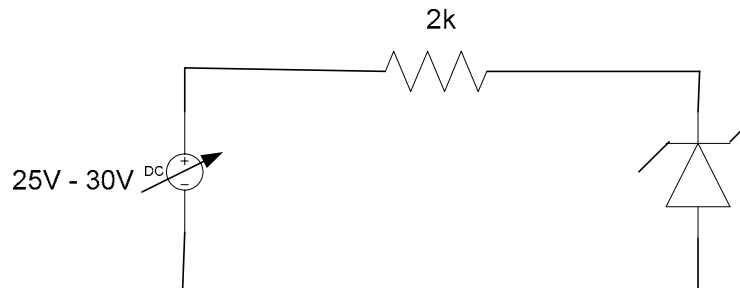
(b)



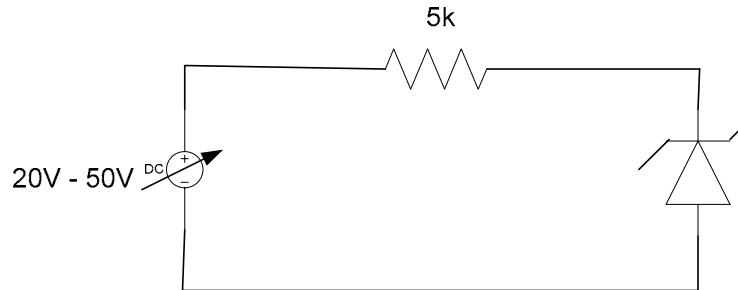
(c)

5) Given the circuit below and taking the Zener voltage to be equal to 6.8V and the Zener resistance to be 6Ω .

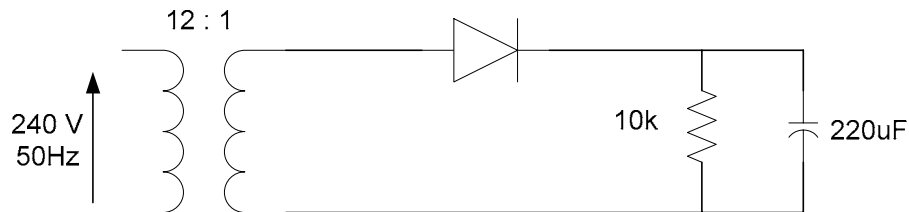
- (i) Find the maximum and minimum currents through the diode,
- (ii) Calculate the regulation factor.



- 6) Given the circuit below and taking the Zener voltage to be equal to 5.7V and the Zener resistance to be 8Ω .
- Find the maximum and minimum currents through the diode,
 - Calculate the regulation factor.



- 7) Given a transformer having 250 turns at the primary side and assuming that the primary is connected to the mains supply.
- Calculate the number of turns at the secondary if the load voltage required is 15V.
 - Calculate the currents in the primary and secondary if the power at the load is 5W.
- 8) Given the circuit below determine the dc voltage and the peak-to-peak ripple voltage.



- 9) A circuit having a resistance of 200Ω , an inductance of 0.5H and a capacitor of $150\mu\text{F}$ in series is connected across a 240V, 50Hz supply. Calculate (a) the impedance of the circuit, (b) the current, (c) the voltage across each component, and (d) The phase difference between the current and the supply voltage.
- 10) Draw the basic gates using CMOS technology.

11) Assuming a digital input, use a truth table to determine the output of the following circuits.

