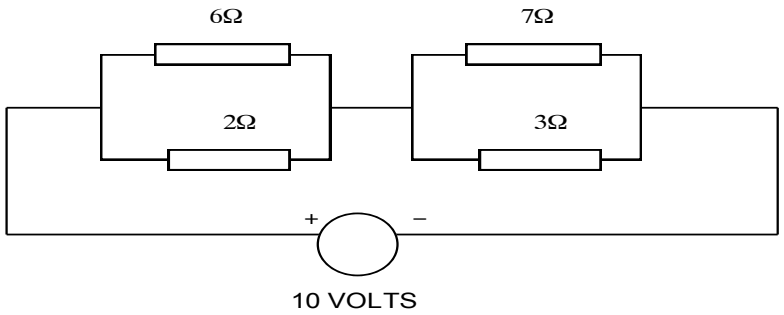
CS1025

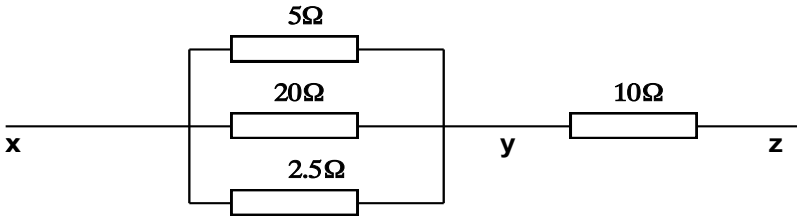
Problem Sheet 2

1. Calculate the current in each of the resistors in the following network with the 10V supply.

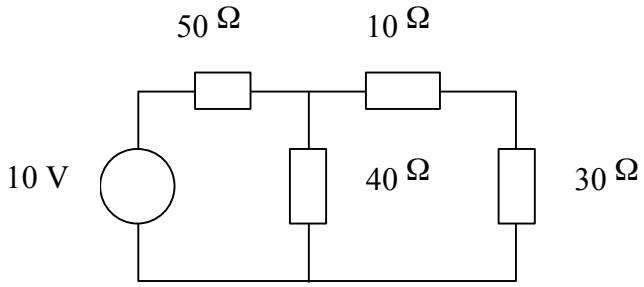


2. If the power dissipated in the 10Ω resistor of the circuit below is 20 watts. Determine

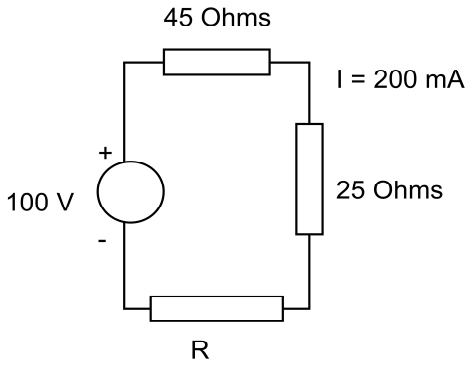
- The current in the 10Ω resistor
- The potential difference across XZ
- The total power dissipated in the circuit.



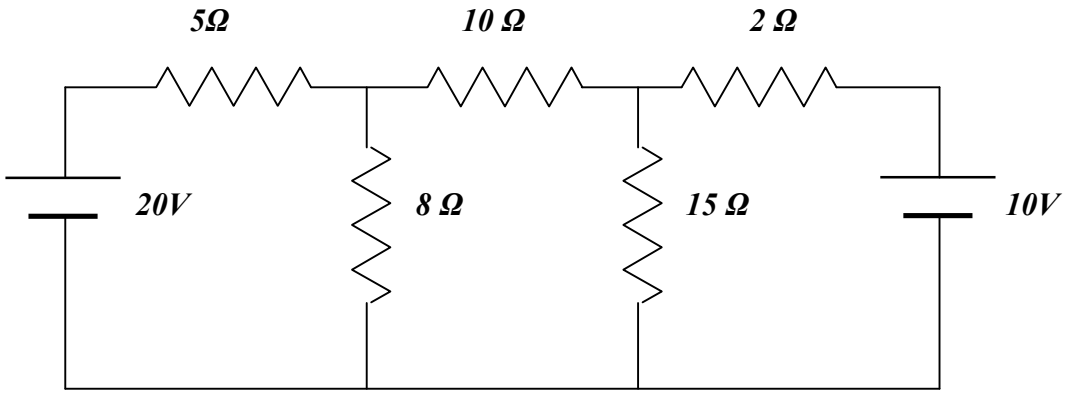
3. Calculate the current in each resistor in the following network. What is the potential difference across the 50 Ohm resistor?



4. Calculate the voltage across the unknown load in the following circuit.



5. Find the current flowing in the 10Ω resistor and the potential difference across the 15Ω resistor using the Principle of Superposition:



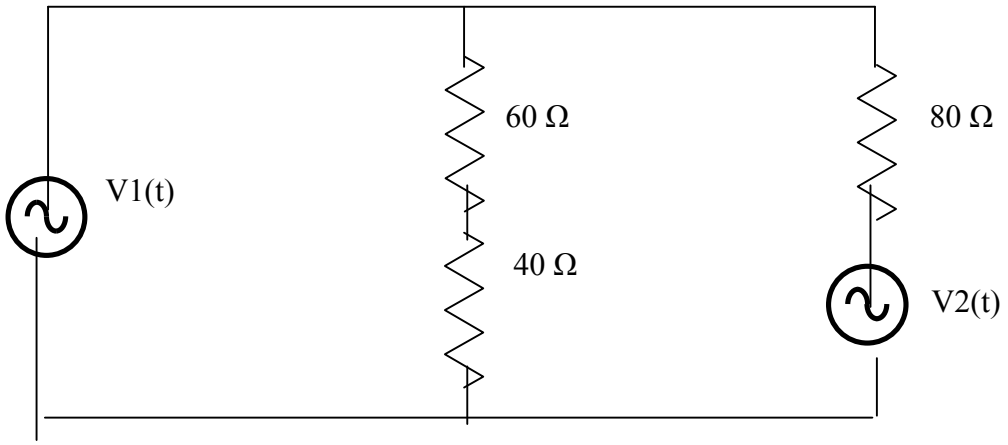
6. Write down expressions for the following sinusoidal voltages:

(i) 10V amplitude and 60Hz frequency
(ii) 0.2V pk-to-pk, 1000 *rad/s* frequency with a $\pi/4 rad$ phase shift
(iii) 100mV amplitude and 1ms period

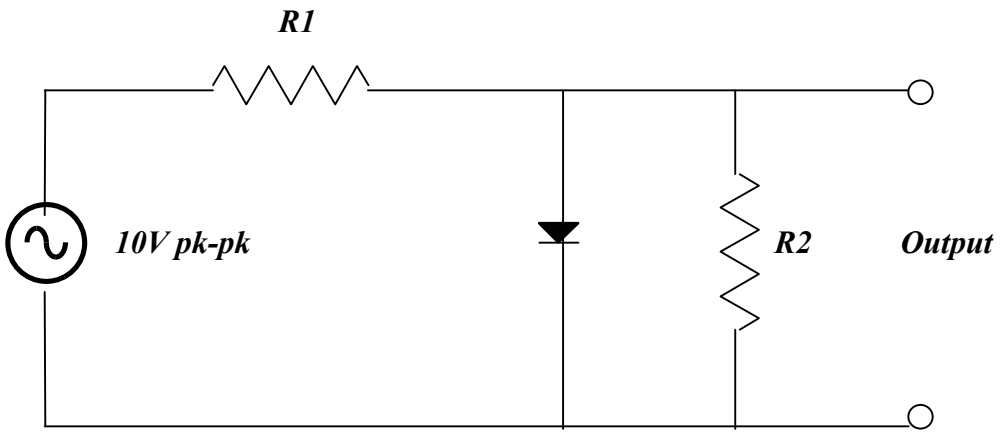
7. Where V1(t)=2V, V2(t)=10V determine:

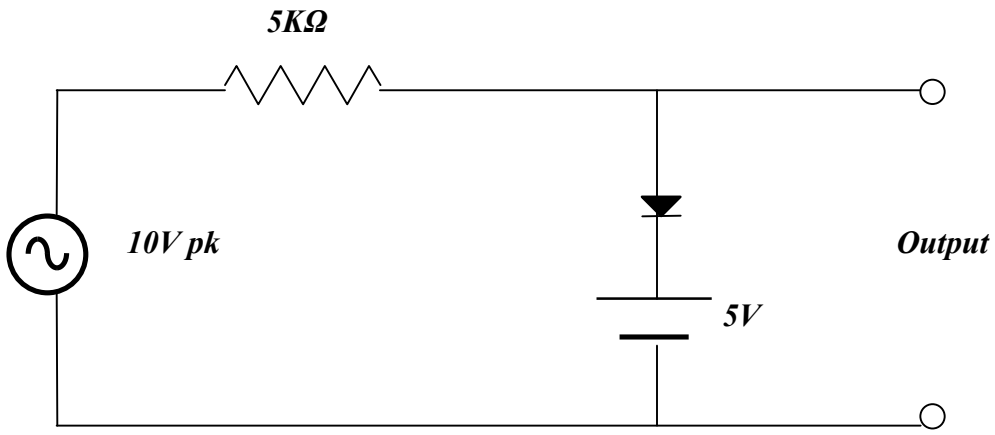
(i) The impedance as 'seen' by the supply in the leftmost branch (V1).
(ii) The current drawn from the supply in the leftmost branch (V1).
(iii) The impedance as 'seen' by the supply in the rightmost branch (V2).
(iv) The current in the rightmost branch

(v) The current in the centre branch.



8. Assuming ideal diodes (forward voltage drop of diode ~ 0V), sketch the outputs of the following circuits:




5KΩ
10V pk
Output
5V