United International University
Department of CSE
CSE 2113: Electrical Circuits
Final Examination
Fall 2022

Time: 2 Hours Full Marks: 40

1.

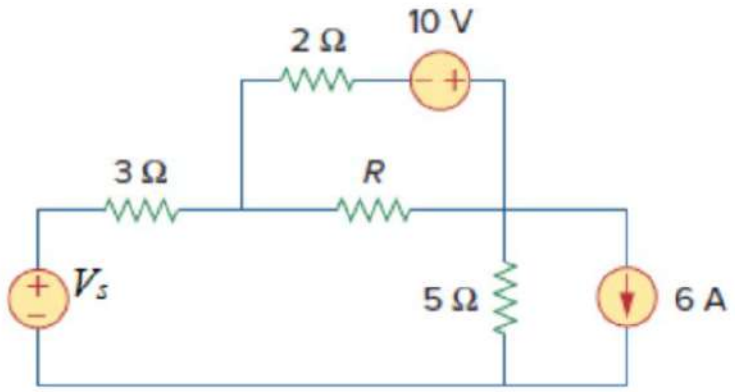

Figure 1 for Question 1.

(a) Find the value of R that would result in the maximum power absorbed by that resistor. Assume that $V_s = 22\ V$. **[7]**

(b) Find the maximum power delivered to the resistor R. **[2]**

2.

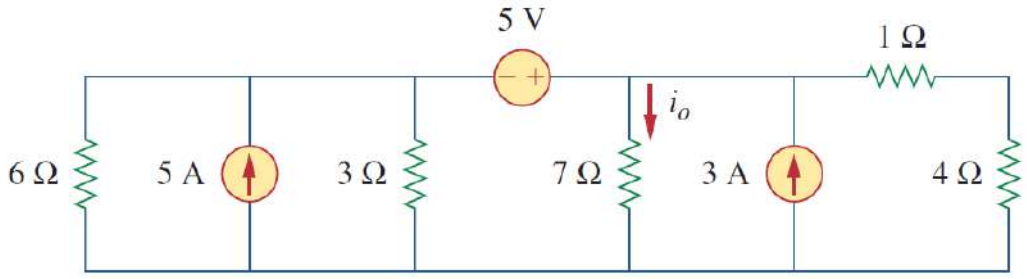

Figure 2 for Question 2.

For the above circuit shown in **Figure 2**, determine the power absorbed the in 7Ω resistor using Source transformation. **[8]**

3.

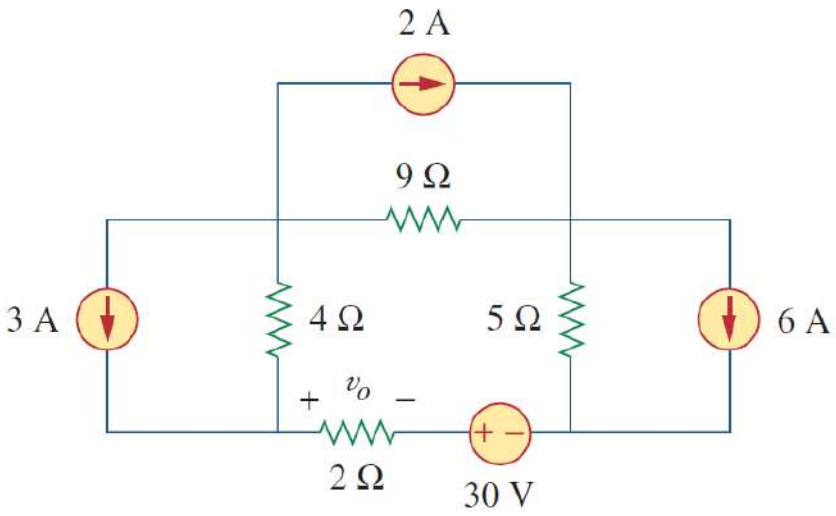

Figure 3 for Question 3.

For the above circuit shown in **Figure 3**, determine v_o using Superposition. **[8]**

4.

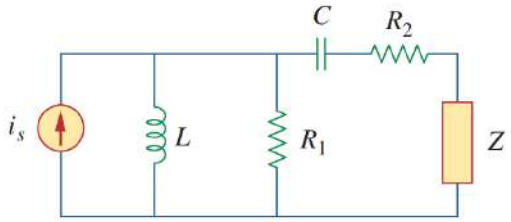

Figure 4 for Question 4.

For the above circuit shown in **Figure 1**, the following information is given:

$i_s = 5\sin(277t + 40^o), L = 10mH, R_1 = 100\Omega, R_2 = 20\Omega, C = 100\mu F, v_{R_1} = 14.46\sin(277t + 125.2^o)$.

Now, determine the followings:

i) Power absorbed by R_1. **[2]**

ii) Value of Z. Explain what type of electrical component constitutes the impedance, Z. **[4]**

iii) Voltage across R_2 resistor. **[2]**

iv) Determine the phase angle difference between i_s & v_{R_2}. Explain which one is leading. **[2]**

5.

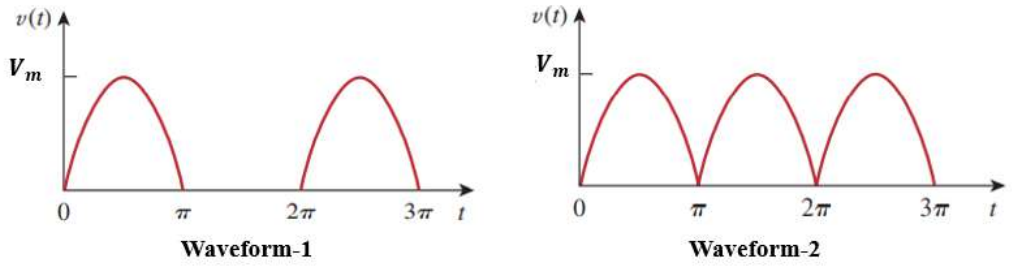

Figure 5 for Question 5.

When the voltage shown in waveform-1 is applied across a 10Ω resistor, on average 2.5W power is absorbed by the resistor. If the voltage shown in waveform-2 is applied across the same resistor, then determine the average absorbed power. **[5]**