Practice Questions

Answer The Following:

First question:

1. (5 points) Starting from Kirchhoff's voltage law, find the equivalent resistance to a summation of three resistances connected in series.
2. (5 points) Describe the steps to convert from a current source to a voltage source.
3. (5 points) voltage and current are out of phase and voltage lags. Using current as reference write the expressions for voltage and currents and sketch their waveforms. Assume that the voltage and current amplitudes are V_m and I_m respectively.

Second question:

1. (10 points) Find the Norton equivalent circuit external to terminals a and b in Figure 1. Also determine the current through R_L.

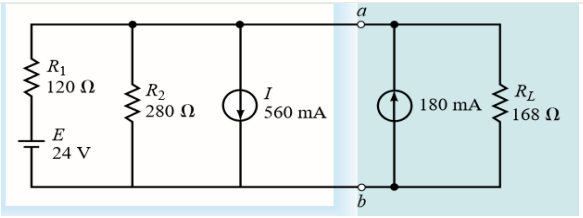

Figure 1

2. (10 points) choose the correct answer

a. When the circuit ground is connected to the device case it is called grounded using
(Earth – ground terminal outlet - chassis ground)

b. Sources that keep the same supply regardless of the circuit components
(Dependent sources - independent sources - none of the others)

c. Current sources of different supply values cannot be connected in
(Series - parallel - whenever two different sources connected they burn)

d. The total inductance for inductive coils connected in series is given by
(Their summation- the reciprocal summation- inductive coils cannot connect in series)

e. The total energy stored is given by
(I*V*t - $0.5*L*I^2$ - both the answers are correct)

f. The ratio of the pulse width and its period multiplied by 100 gives
(pulse repetitive rate - pulse train - pulse duty cycle)

g. The summation of the voltage rises and drops across a closed loop in a circuits adds up to
(Kirchhoff voltage law - Kirchhoff current law - zero)

h. The time it takes the capacitor to discharge almost 99% of its stored charge is given by
(3R/L - 5RC - 5L/R)

i. The mesh analysis technique first assumption is to assign a current to each
(Resistance branch - small inner loop – to each supply)

Please turn over ==========➔

j. When $I=I_m\sin(wt+\theta)$ and $V=V_m\sin(wt+\theta)$ then current
(Leads the voltage - lags the voltage – in phase with the voltage)

Third question:

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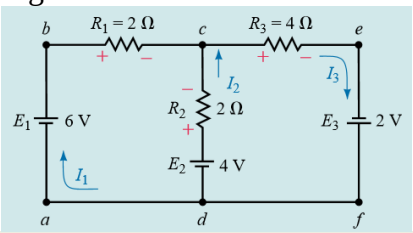
1. (10 points)Drive the relation for current and voltage for a charging capacitor. Draw this relation along with time.

2.

1. (10 points) Using branch current analysis find the current in each branch in the circuit in figure 2.

Figure 2

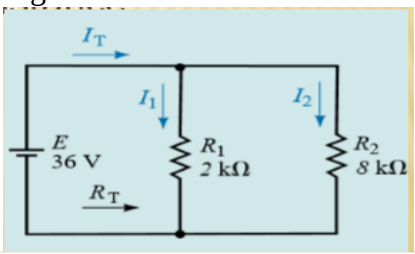


Fourth question:

a) (5 points)Define stray capacitance and stray inductance.

b) (10 points) Find :
Total resistance
Total current derived from the source
Total power delivered by the source
Current in each resistance
Power dissipated in each resistance

Figure 3



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