CENTURION CAMPUS

INDUSTRIAL ELECTRONICS N2 EXERCISE

4/5/2020 to 15/5/2020

DIRECT CURRENT THEORY

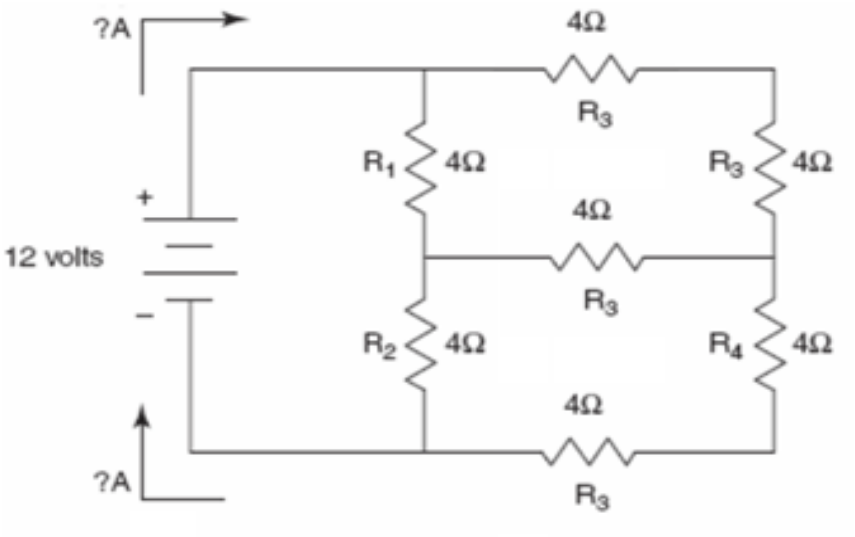
1. Three resistors with values 2 Ω, 3 Ω and 5 Ω are connected in series then these three series resistors are connected in parallel to a 10 Ω resistor. The DC supply voltage to the circuit is 24 V

1.1 Draw a fully labelled circuit diagram explained above and calculate:

1.2 The supply current and [4,8 A]

1.3 The voltage drop across the 3 Ω resistor. [7,2 V]

2.

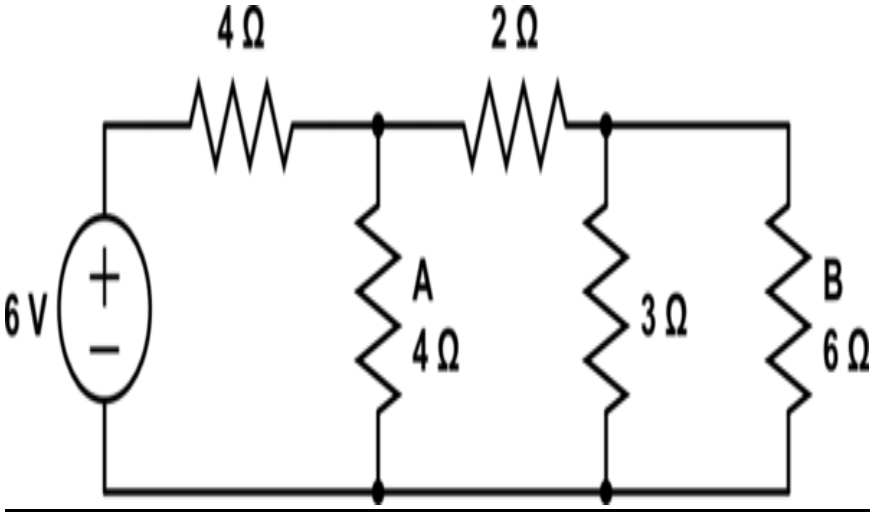


REFER TO THE CIRCUIT ABOVE AND CALCULATE:

2.1 The total resistance of the circuit [1 Ω]

2.2 The supply current [12 A]

3.



USE THE CIRCUIT ABOVE AND DETERMINE THE FOLLOWING:

3.1 The total resistance of the circuit [6 Ω]

3.2 The current flowing through the circuit [1 A]

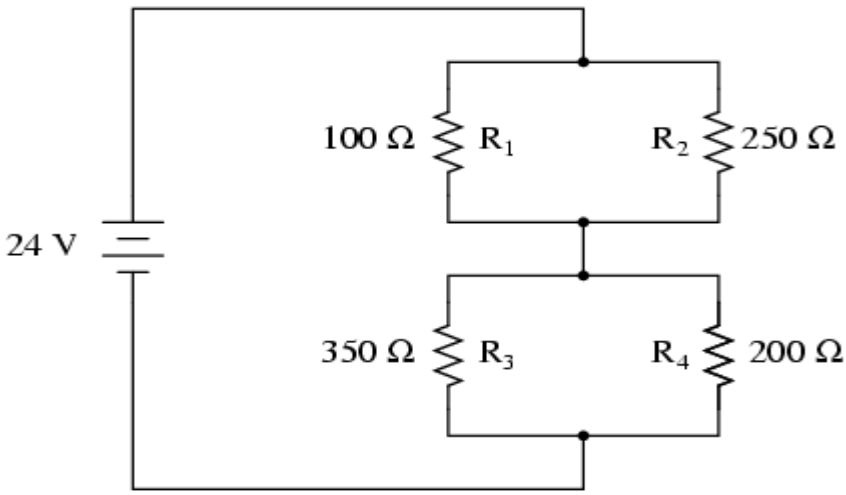
3.3 The voltage across the 6 Ω resistor [1 V]

3.4 The voltage across the 2 Ω resistor [1 V]

3.5 The current through the 3 Ω resistor [0,333 A]

4.

A series-parallel combination circuit



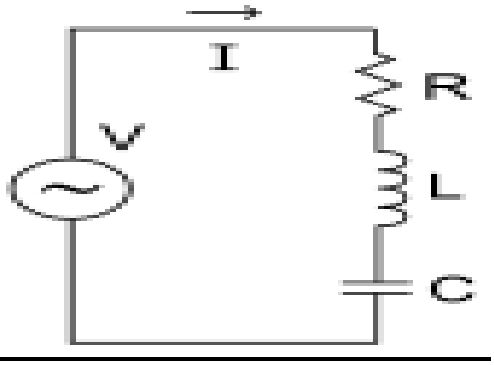
CALCULATE THE FOLLOWING USING THE CIRCUIT GIVEN ABOVE

4.1 The supply current [0,121 A]

4.2 The voltage across resistor R_2 (250 Ω) [8,643 A]

4.3 The voltage across resistor R_3 (350 Ω) [15,400 A]

5.



NOTE: R = 10 Ω; L = 56mH & C =100 uF; V = 240 V & frequency = 50 Hz

USE THE VALUES GIVEN ON THE CIRCUIT ABOVE AND DETERMINE THE FOLLOWING:

5.1 The inductive reactance [17.593 Ω]

5.2 The capacitive reactance [31,831 Ω]

5.3 The impedance of the circuit [17,399 Ω]

5.4 The voltage across each component [V_R = 137,94 V; V_L = 137,94 V; V_C = 137,94 V]

5.5 The phase angle and [61,020 ^{0}]

5.6 Draw the phasor diagram for this circuit

6. An alternating current wave has a peak to peak value of 60 V and calculate:

6.1 The peak value [30 V]

6.2 The RMS value [21,21 V]

6.3 The average value [19,11 V]

6.4 The form factor [1,11]

6.5 The crest factor [1,414]