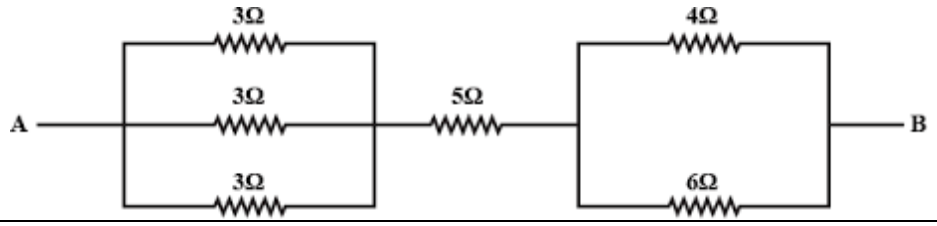
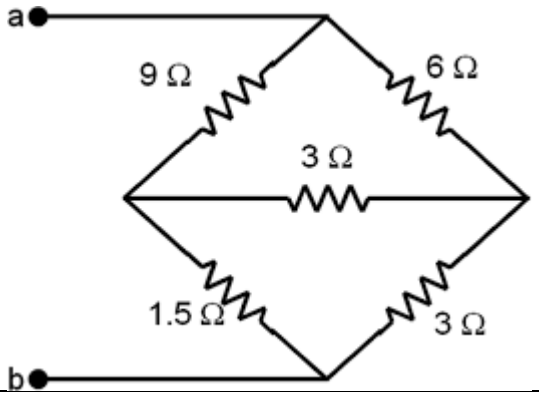
PARUL UNIVERSITY

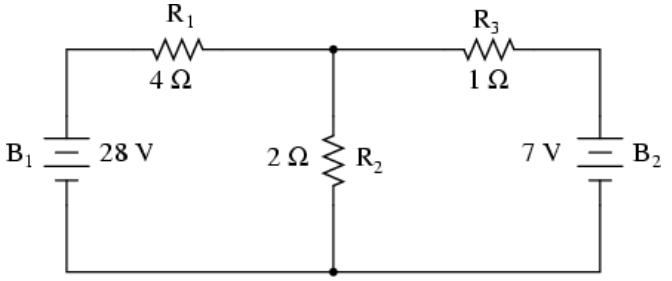
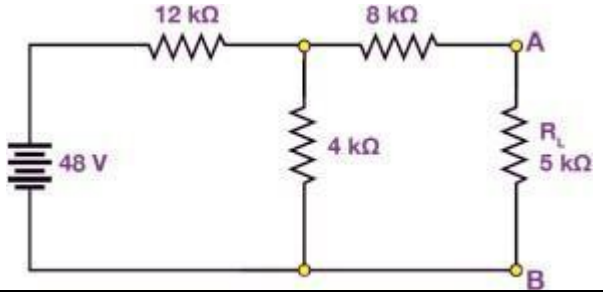
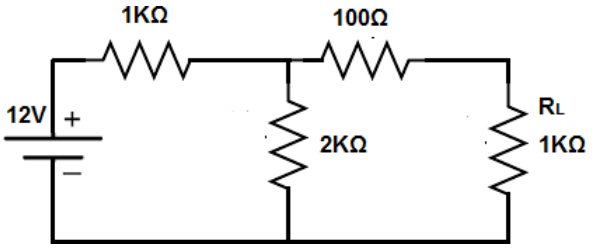
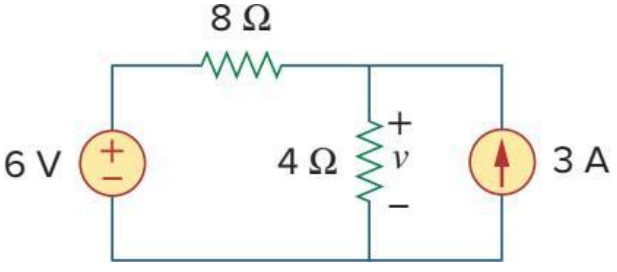
FACULTY OF ENGINEERING & TECHNOLOGY

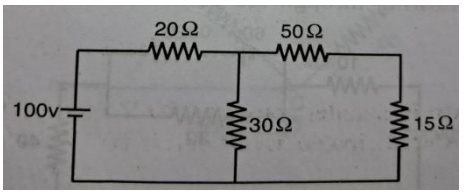
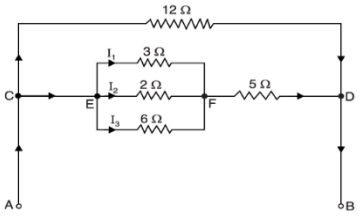
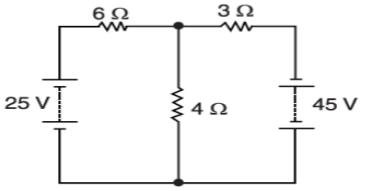
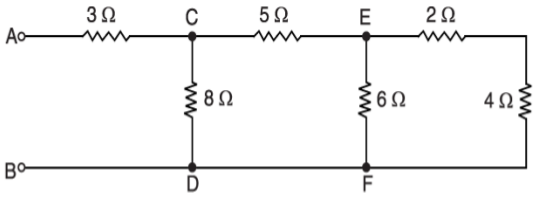
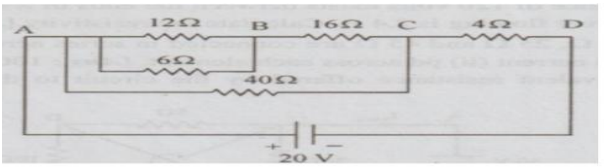
DEPARTMENT OF ELECTRICAL ENGINEERING

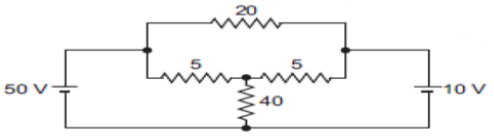
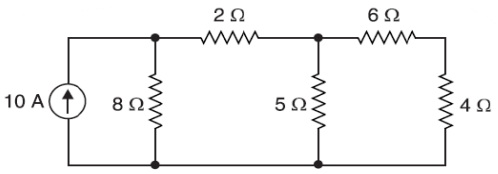
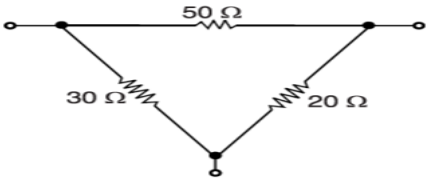
SUBJECT: Electrical and Electronics Engineering **SUBJECT CODE: 303106103**

Assignment-1 D.C. Circuit

1.	Discuss the following ideal electrical circuit element: A. Resistor B. Inductor C. Capacitor
2.	Differentiate between the following with appropriate examples: A. Voltage and current source B. Active and passive elements
3.	State and explain Kirchhoff Current and Kirchhoff Voltage Laws.
4.	Write the Difference between series circuit and parallel circuit.
5.	Determine the resistance between points A and B in the network shown in Fig. (Ans: 8.4 ohm) 
6.	Derive current divider and voltage divider equations.
7.	Write the formula for star to delta and delta to star conversion.
8.	Find out the resistance between the terminals a and b in the circuit shown in the Fig. (Ans: 4.7143 ohm) 
9.	Write and explain the superposition theorem with a suitable example.

10.	Write down the steps of the Superposition theorem and find the current flowing through a 2 kΩ resistor using the Superposition theorem: (Ans: 4A) 
11.	Write and explain Thevenin's theorem with a suitable example
12.	Write down the steps of Thevenin theorem and find the current flowing through a 5 kΩ resistor using the Thevenin's theorem (Ans: 0.75 mA) 
13.	Write and explain Norton's theorem with a suitable example.
14.	Write down the steps of Norton's theorem and find the current through 1 kΩ resistor for a given circuit using Norton's theorem: (Ans: 4.5283 mA) 
15.	By using the superposition theorem find "v" in the circuit. (Ans: 10 V) 

16.	Find the equivalent resistance of two resistors when connected in Series and Parallel.
17.	Find the equivalent capacitance of two capacitors when connected in Series and Parallel.
18.	Find the equivalent Inductance of two Inductors when connected in Series and Parallel.
19.	 Using KVL, determine the total current drawn from the source and also the current in the circuit shown below at 15 Ω resistance. (Ans: 2.468 A, 0.779 A)
20.	A 24V battery is connected to a series circuit containing two resistors of 6Ω and 12Ω. Calculate the current in the circuit and the voltage drop across each resistor. (Ans: 1.33 A, 8 V, 16 V)
21.	 Calculate the effective resistance as given in Fig. (Ans: 4 ohm)
22.	 Using Kirchhoff's laws, find the current in various resistors in the circuit shown in Fig. (Ans: -0.093 A, 6.48 A, 6.39 A)
23.	 Find the equivalent resistance between terminals A and B. (Ans: 7 Ohm)
24.	 Calculate the equivalent resistance of the following combination of resistors and also the source current in Fig. (Ans: 17.33-ohm, 1.154 A)

25.	 Using superposition theorem, find the current through the 40-ohm resistor in the circuit shown in Fig. (Ans: 0.707 A downward)
26.	 Using Norton's theorem calculate the current in 5-ohm resistor in the circuit shown in Fig. (Ans: 4A)
27.	 Convert the delta network shown in Fig. into an equivalent star network. (Ans: 15Ω,10Ω,6Ω)