Department of Electrical Engineering
Indian Institute of Technology, Kanpur

ESc 201 **Home Assignment #1** **Assigned: 2.8.18**

1. Use KCL to find the unknown currents in the circuit shown in Fig.1. Assume that $I_0 = -2$ A, $I_1 = -4$ A, $I_S = 8$ A, and $V_S = 12$ V. Using these results, find the values of the resistances R_1-R_3, if $R_0 = R_4 = 1\ \Omega$.

2. For the circuit shown in Fig.2, determine the current flowing through each resistor and the voltage V appearing across the current source I (= 1 A).

3. For the circuit shown in Fig.3, determine which components are absorbing power and which are delivering power. Is conservation of power satisfied for this circuit? Justify.

4. In Fig.4, determine the power delivered by the dependent source.

5. Determine the equivalent resistance of the infinite network of resistors shown in Fig.5. All resistors are of equal value R.

6. Using node voltage analysis for the circuit shown in Fig.6, determine the current I flowing through the voltage source. Data: $R_1 = 100\ \Omega$, $R_2 = 5\ \Omega$, $R_3 = 200\ \Omega$, $R_4 = 50\ \Omega$, $V_S = 50$ V, and $I_S = 0.2$ A.

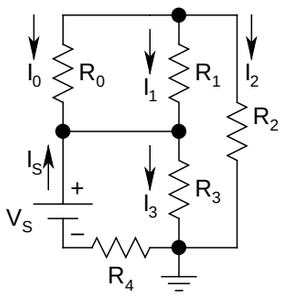

Fig.1

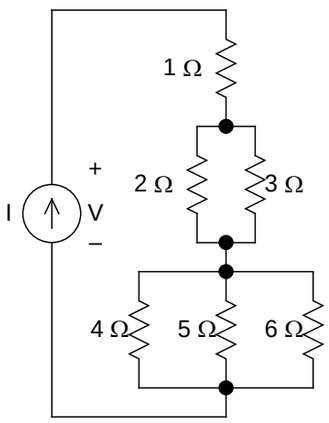

Fig.2

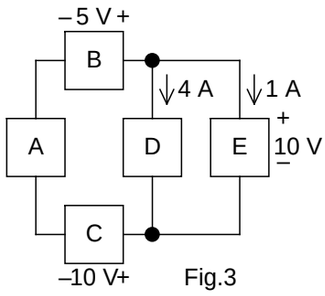

Fig.3

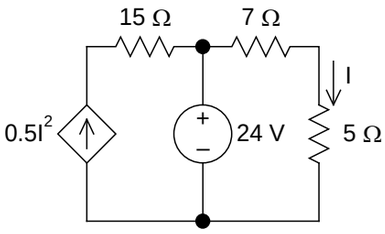

Fig.4

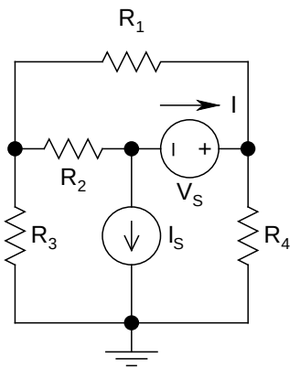

Fig.6

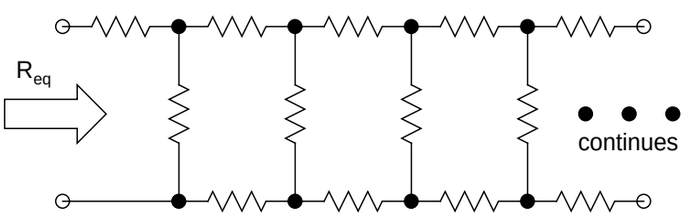

Fig.5