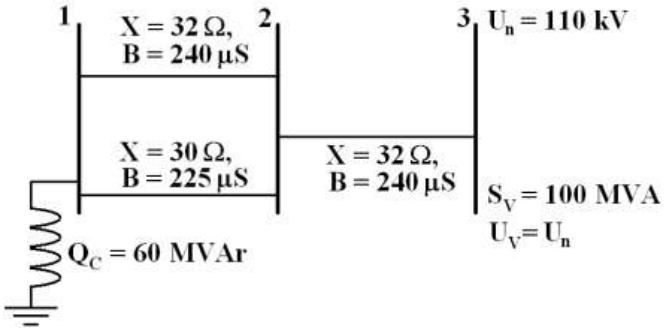
Example: Calculate the bus admittance matrix in per units.



Calculation:

$$\underline{\bar{y}}_{121} = \frac{1}{jX}\frac{U_V^2}{S_V} = -j3.78125\ pu$$

$$\underline{\bar{y}}_{1201} = j\frac{B}{2}\frac{U_V^2}{S_V} = j0.01452\ pu$$

$$\underline{\bar{y}}_{122} = \frac{1}{jX}\frac{U_V^2}{S_V} = -j4.03333\ pu$$

$$\underline{\bar{y}}_{1202} = j\frac{B}{2}\frac{U_V^2}{S_V} = j0.0136125\ pu$$

$$\underline{\bar{y}}_{23} = \frac{1}{jX}\frac{U_V^2}{S_V} = -j3.78125\ pu$$

$$\underline{\bar{y}}_{230} = j\frac{B}{2}\frac{U_V^2}{S_V} = j0.01452\ pu$$

$$\underline{\bar{y}}_{10} = -j\frac{Q_C}{U_n^2}\frac{U_V^2}{S_V} = -j0.6\ pu$$

Admittance matrix has the general form as follows:

$$\underline{\bar{A}} = \begin{bmatrix} \underline{\bar{y}}_{121}+\underline{\bar{y}}_{1201}+\underline{\bar{y}}_{122}+\underline{\bar{y}}_{1202}+\underline{\bar{y}}_{10} & -\underline{\bar{y}}_{121}-\underline{\bar{y}}_{122} & 0 \\ -\underline{\bar{y}}_{121}-\underline{\bar{y}}_{122} & \underline{\bar{y}}_{121}+\underline{\bar{y}}_{1201}+\underline{\bar{y}}_{122}+\underline{\bar{y}}_{1202}+\underline{\bar{y}}_{23}+\underline{\bar{y}}_{230} & -\underline{\bar{y}}_{23} \\ 0 & -\underline{\bar{y}}_{23} & \underline{\bar{y}}_{23}+\underline{\bar{y}}_{230} \end{bmatrix}$$

After putting all the values inside:

$$\underline{\bar{A}} = j\begin{bmatrix} -8.3864475 & 7.81458 & 0 \\ 7.81458 & -11.5531775 & 3.78125 \\ 0 & 3.78125 & -3.76673 \end{bmatrix} pu$$