Assignment # 9

1. Develop a model for a synchronous generator with third harmonic stator voltage excitation in a manner similar to the negative sequence and fifth harmonic models developed during session 20.

\[ v_a(t) = \sqrt{2}V_{rms,3}\cos \{ 3(\omega t + \gamma_3) \} \]

\[ v_b(t) = \sqrt{2}V_{rms,3}\cos \left\{ 3(\omega t + \gamma_3 - \frac{2\pi}{3}) \right\} \]

\[ v_c(t) = \sqrt{2}V_{rms,3}\cos \left\{ 3(\omega t + \gamma_3 + \frac{2\pi}{3}) \right\} \]

2. Develop a model for a synchronous generator with a seventh harmonic stator voltage excitation in a manner similar to the negative sequence and fifth harmonic models developmented during session 20.

\[ v_a(t) = \sqrt{2}V_{rms,7}\cos \{ 7(\omega t + \gamma_7) \} \]

\[ v_b(t) = \sqrt{2}V_{rms,7}\cos \left\{ 7(\omega t + \gamma_7 - \frac{2\pi}{3}) \right\} \]

\[ v_c(t) = \sqrt{2}V_{rms,7}\cos \left\{ 7(\omega t + \gamma_7 + \frac{2\pi}{3}) \right\} \]