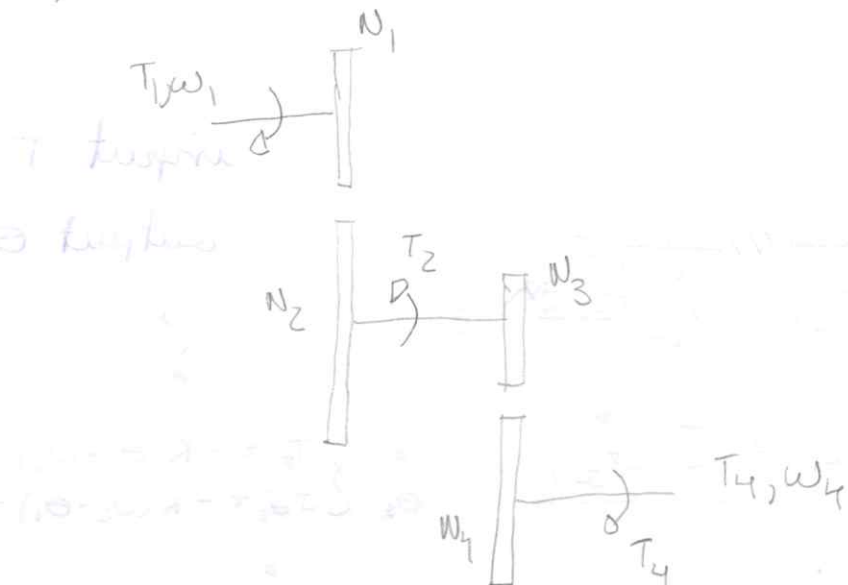


5a)

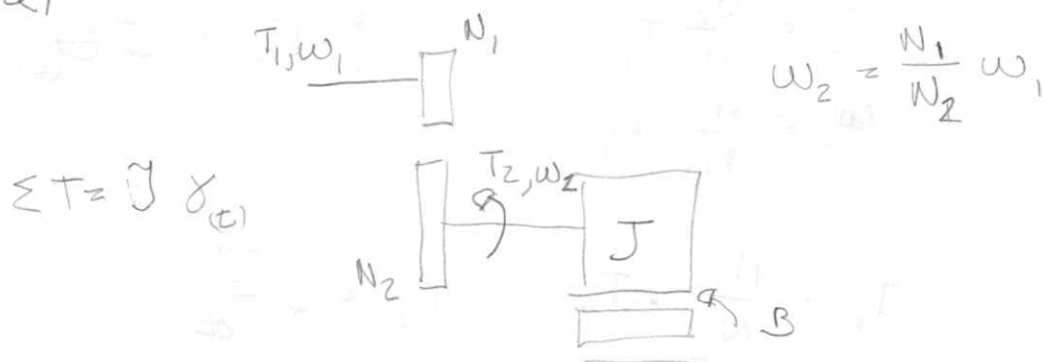


$$T_1 = \frac{N_2}{N_1} T_2, \quad T_2 = \frac{N_3}{N_4} T_4$$

$$T_1 = \frac{N_2}{N_1} \cdot \frac{N_3}{N_4} T_4$$

$$= \frac{N_2 N_3}{N_1 N_4} \cdot J \ddot{\theta}_{4(t)}$$

6a)



$$\omega_2 = \frac{N_1}{N_2} \omega_1$$

$$\Sigma T = J \ddot{\theta}_{(t)}$$

$$T_1 = \frac{N_1}{N_2} T_2; \quad T_2 - B(\dot{\theta}_{2(t)}) = J \ddot{\theta}_{2(t)}$$

$$T_2 = B\left(\frac{N_1}{N_2} \dot{\omega}_{1(t)}\right) + J \frac{N_1}{N_2} \dot{\omega}_{1(t)}$$

$$= \frac{N_1}{N_2} \left[\frac{N_1}{N_2} (B \omega_{1(t)} + J \dot{\omega}_{1(t)}) \right]$$