A simple version of a mechanical speed governor is shown in the figure. It consists of three point masses, two of mass $m_1$ and one of $m_2$, connected by massless rods of length $L$ that are free to pivot at all joints. Two of the rods are attached to a vertical axle at point A as shown in the figure. The angle, $\theta$, between the rods and the axle can vary. As $\theta$ varies, mass $m_2$ slides freely along the axle. The axle rotates with a constant angular speed, $\Omega$, and the masses and rods are constrained to rotate with the same $\Omega$.

a. What is the minimum rotation speed, $\Omega_{\text{min}}$, for which an equilibrium configuration, $\theta_\text{eq}$, of the masses exists at nonzero $\theta$?

b. What is the limiting value of $\theta_\text{eq}$ as $\Omega \to \infty$?

c. For $\Omega > \Omega_{\text{min}}$, what is the frequency of small oscillations about $\theta_\text{eq}$? You may express your answer in terms of $m_1, m_2, L, g, \Omega$, and/or $\theta_\text{eq}$.