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, θ, between the rods and the axle can vary. As θ varies, mass m_2 slides freely along the axle. The axle rotates with a constant angular speed, Ω, and the masses and rods are constrained to rotate with the same Ω.

a. What is the minimum rotation speed, Ω_{min}, for which an equilibrium configuration, θ_c, of the masses exists at nonzero θ?

b. What is the limiting value of θ_c as $\Omega \rightarrow \infty$?

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