96. The distance from the relaxed position of the bottom end of the spring to its equilibrium position when the body is attached is given by Hooke's law: $\Delta x = F/k = (0.20\,\text{kg})(9.8\,\text{m/s}^2)/(19\,\text{N/m}) = 0.103$ m.

(a) The body, once released, will not only fall through the Δx distance but continue through the equilibrium position to a "turning point" equally far on the other side. Thus, the total descent of the body is $2\Delta x = 0.21$ m.

(b) Since $f = \omega/2\pi$, Eq. 16-12 leads to

$$f = \frac{1}{2\pi}\sqrt{\frac{k}{m}} = 1.6 \text{ Hz} .$$

(c) The maximum distance from the equilibrium position is the amplitude: $x_m = \Delta x = 0.10$ m.