70. (a) Recalling from Ch. 12 the simple harmonic motion relation $u_m = y_m\omega$, we have

$$\omega = \frac{16}{0.04} = 400 \text{ rad/s} .$$

Since $\omega = 2\pi f$, we obtain $f = 64$ Hz.

(b) Using $v = f\lambda$, we find $\lambda = 80/64 = 1.26$ m.

(c) Now, $k = 2\pi/\lambda = 5$ rad/m, so the function describing the wave becomes

$$y = 0.04 \sin(5x - 400t + \phi)$$

where distances are in meters and time is in seconds. We adjust the phase constant ϕ to satisfy the condition $y = 0.04$ at $x = t = 0$. Therefore, $\sin\phi = 1$, for which the "simplest" root is $\phi = \pi/2$. Consequently, the answer is

$$y = 0.04 \sin\left(5x - 400t + \frac{\pi}{2}\right) .$$