7. Rather than reproduce the analysis in §12-3, we simply use the results from that section.

(a) We substitute $I = \frac{2}{5}MR^2$ (Table 11-2(f)) and $a = -0.10g$ into Eq. 12-10:

$$-0.10g = -\frac{g\sin\theta}{1 + \left(\frac{2}{5}MR^2\right)/MR^2} = -\frac{g\sin\theta}{7/5}$$

which yields $\theta = \sin^{-1}(0.14) = 8.0°$.

(b) The acceleration would be more. We can look at this in terms of forces or in terms of energy. In terms of forces, the uphill static friction would then be absent so the downhill acceleration would be due only to the downhill gravitational pull. In terms of energy, the rotational term in Eq. 12-5 would be absent so that the potential energy it started with would simply become $\frac{1}{2}mv^2$ (without it being "shared" with another term) resulting in a greater speed (and, because of Eq. 2-16, greater acceleration).