Answer on Question #58104 - Physics – Mechanics | Relativity

Task 6 When a 30-g mass is hung from the end of a spring, the spring stretches 8.0 cm. The same spring with a mass of 200 g at at its end is stretched 5.0 cm, released and allowed to oscillate on a frictionless horizontal surface. Find the frequency of the oscillation.

0.54 Hz

0.68 Hz

0.34 Hz

9.5 Hz

Task 7 The system shown is an example of the Atwood's machine. What is the acceleration of the masses? Assume the the pulley is frictionless and the rope massless. Take g=9.8m/s2

4.2m/s2

7.4m/s2

9.8m/s2

3.3m/s2

Solution

Task 7. Can't be solved, because there is not enough data.

Task 6.

In first, due to Hooke's law system is in equilibrium, so that $mg = kx$, where m – is mass of 30g, g – is free fall acceleration, k – Hooke's coefficient for sprint, x – spring extension. From here we can find k.

$$k = \frac{mg}{x} = \frac{0.03 \cdot 10}{0.08} = 3.75\ \frac{N}{m}$$

Frequency of oscillation can be found as $f = 2\pi\sqrt{\frac{k}{M}}$, where M is 200g=0.2 kg

$$f = \frac{1}{2\pi}\sqrt{\frac{3.75}{0.2}} = 0.68\ Hz$$