cq6-21

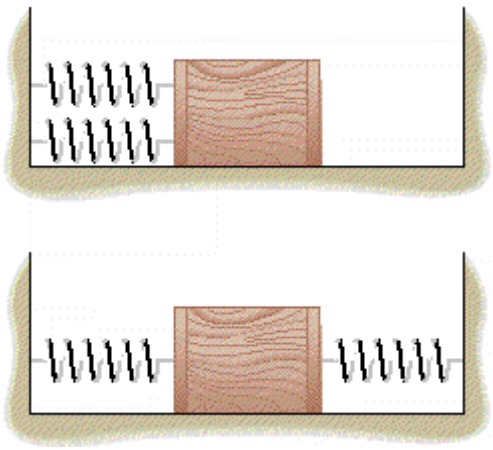
1. CJ6 10.CQ.001. [310930] Two people pull on a horizontal spring that is attached to an immovable wall. Then, they detach it from the wall and pull on opposite ends of the horizontal spring. They pull just as hard in each case. In which situation, if either, does the spring stretch more?

- the spring stretches the same in both cases
- when not attached to the wall
- when attached to the wall

Account for your answer.

2. CJ6 10.CQ.002. [310948] The drawing shows identical springs that are attached to a box in two different ways. Initially, the springs are unstrained. The box is then pulled to the right and released. In each case the initial displacement of the box is the same. At the moment of release, which box, if either, experiences the greater net force due to the springs?

- both boxes experience the same net force
- the box in the bottom picture
- the box in the top picture



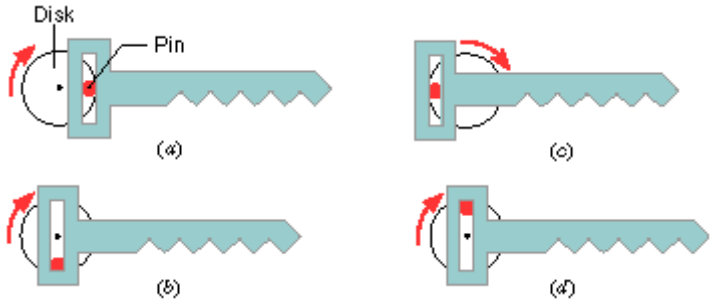
Provide a reason for your answer.

3. CJ6 10.CQ.004. [311046] A steel ball is dropped onto a concrete floor. Over and over again, it rebounds to its original height. Is the motion simple harmonic motion?

- yes
- no

Justify your answer.

4. CJ6 10.CQ.008. [310914] An electric saber saw consists of a blade that is driven back and forth by a pin mounted on the circumference of a rotating circular disk. As the disk rotates at a constant angular speed, the pin engages a slot and forces the blade back and forth, in the sequence (*a*), (*b*), (*c*), and (*d*) shown..



Is the motion of the blade simple harmonic motion?

- yes
- no

Explain.

5. CJ6 10.CQ.009. [311044] Is more elastic potential energy stored in a spring when the spring is compressed by one centimeter than when it is stretched by the same amount?

- yes
- no

Explain.

6. CJ6 10.CQ.010. [310954] Suppose that a grandfather clock (a simple pendulum) is running slowly. That is, the time it takes to complete each cycle is longer than it should be. Should one shorten or lengthen the pendulum to make the clock keep the correct time?

- lengthen
- shorten

Why?

7. CJ6 10.CQ.011. [310887] In principle, the motion of a simple pendulum and an object on an ideal spring can both be used to provide the basic time interval or period used in a clock. Which of the two kinds of clocks becomes more inaccurate when carried to the top of a high mountain?

- pendulum
- spring

Justify your answer.

8. CJ6 10.CQ.013. [311061] Two people are sitting on playground swings. One person is pulled back 4° from the vertical and released, while the other is pulled back 8° from the vertical and released. If the two swings are started together, will they both come back to the starting points at the same time?

- yes
- no

Justify your answer.