Name _____

Physics 132 **Prof. Redish**
Spring 2017 **Quiz #10** **17.April.17**
(10 points)

1. (4 points) Below are shown four equations and five descriptions of a physical system. For each equation select which physical system (in an idealized model) could be appropriately described by that equation and put the letter in the box next to it.

1.1 $x(t) = A\sin(\omega t + \phi)$ ☐

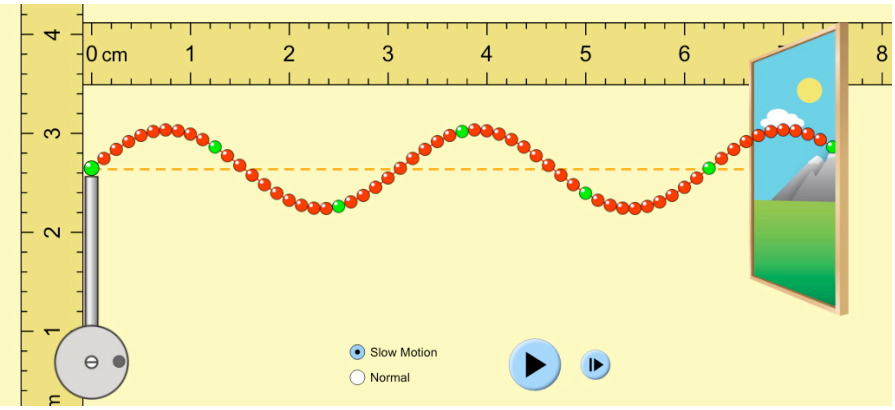
1.2 $y(x,t) = A\sin(kx)\cos(\omega t)$ ☐

1.3 $y(x,t) = A\sin\left(\frac{2\pi}{\lambda}[x - v_0 t]\right)$ ☐

1.4 $y(x,t) = A\sin(kx + \omega t)$ ☐

A. A transverse traveling wave on a long taut spring traveling in the positive x direction.
B. A transverse traveling wave on a long taut spring traveling in the negative x direction
C. A mass hanging from a spring, oscillating around its equilibrium position.
D. A standing wave on a long taut spring.
E. None of these physical systems corresponds to this equation.

2. (6 points) In the figure below is shown an elastic string that is being driven by a rotating bar to produce a sinusoidal oscillation. The string is modeled by massive beads connected by massless (and invisible) springs. The wave produced moves to the right and out through the window for a long distance. It is shown at a time $t = 0$. Use the distance scale shown by the rulers. The rod driving the wave goes through a single complete up-down-up cycle in a time of 0.5 seconds.



2.1. From this picture, can you figure out with what speed the wave is traveling down the string? If so, find it and put it in the box. If not, put "NO" in the box and in the space below explain what you would need to know to find it. (2 pts) ☐

2.2 From this picture, can you figure out the amplitude of the wave traveling down the string? If so, find it and put it in the box. If not, put "NO" in the box and in the space below explain what you would need to know to find it. (2 pts) ☐

2.3 From this picture, could you figure out the up or down velocity of the bead attached to the driving rod at the instant shown? If so, check "YES" but do not calculate it. If not, check "NO" in the box. (2 pts)

Yes___

No ___