PHY2048C, Final Exam

A- Read all the exam once, or twice, before beginning to write. Make sure to comprehend all questions and start with those you feel most confident in.
B – Be clear and concise. There are no extra points for being verbose or writing extra.
C –Only use the white pages that I will provide. You have 180 minutes to answer the exam.

Problem 1
The strings and rods have negligible weight, and the rods are to hang horizontally. Find the weights of the balls A, B, and C
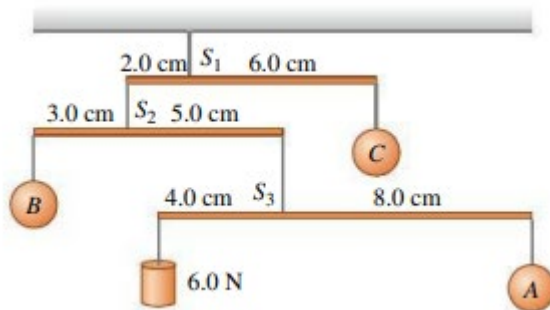
Problem 2

In the figure, a greased pig (no friction) has a choice of three frictionless slides along which to slide to the ground. Rank the slides according to how much work the gravitational force does on the pig during the descent, greatest first
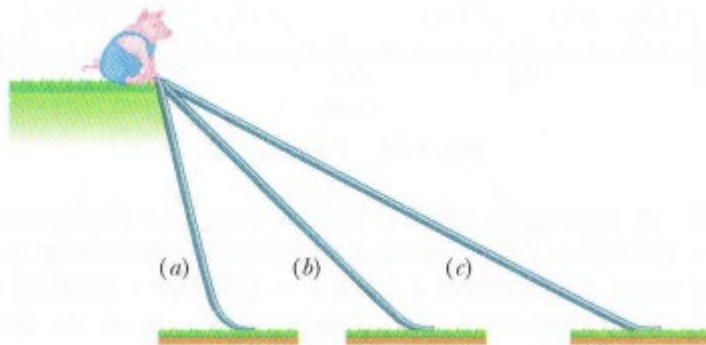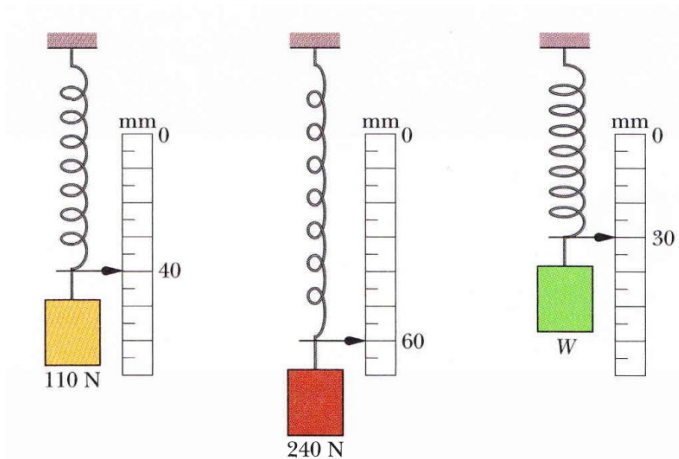

FIG. 7-19   Question 5.

Problem 3

A spring with a pointer attached is hanging next to a scale marked in millimeters. Three different packages are hung from the spring, in turn, as shown in the figure Which mark on the scale will the pointer indicate when no package is hung from the spring?

Problem 4

A siphon is a convenient device for removing liquids from containers. To establish the flow, the tube must be initially filled with fluid. Let the fluid have density ρ, and let the atmospheric pressure be Patm. Assume that the cross-sectional area of the tube is the same at all points along it. If the lower end of the siphon is at a distance h below the surface of the liquid in the container, what is the speed of the fluid as it flows out the lower end of the siphon? (Assume that the container has a very large diameter compared to the syphon, and ignore any effects of viscosity.)
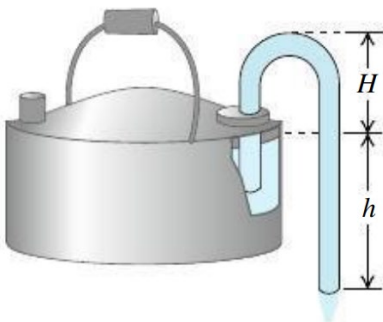
Problem 5
Explain how the fluid manages to go "uphill" in the initial part of the syphon

Problem 6

A ball is shot from ground level over level ground at a certain initial speed. The Figure gives the range R of the ball versus its launch angle θ_0. Rank the three lettered points on the plot according to the ball's speed at maximum height, greatest first.