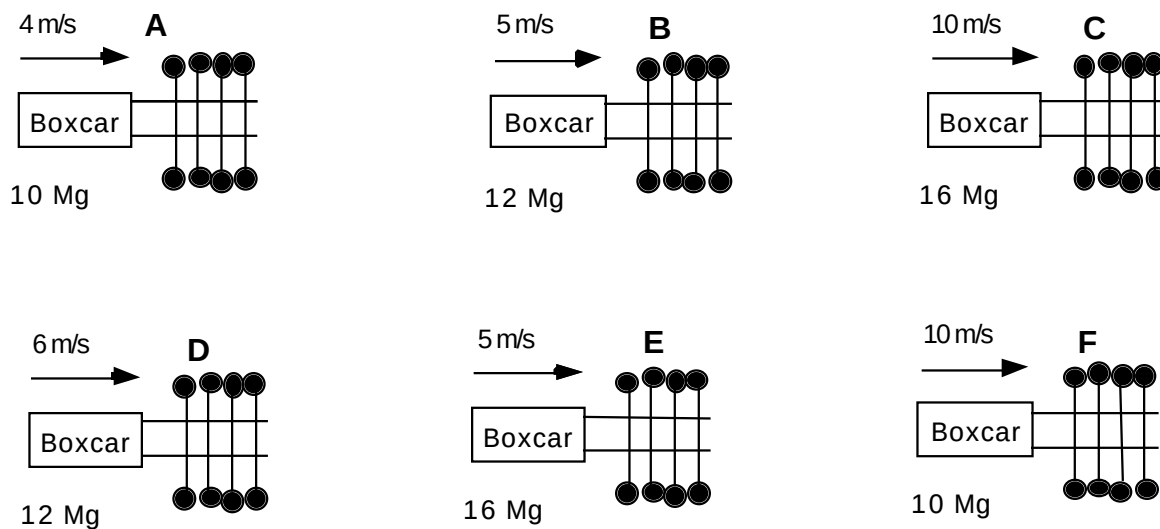


Boxcars and Ropes—Stopping Force in Same Distance ⁵⁶

In a western movie, a confederate raiding party stopped a runaway boxcar carrying gold by using many ropes tied to trees. Given below are six boxcars that are moving along horizontal railroads at specified speeds. Also given are the masses of the boxcars. All of the boxcars are the same size and shape, but they are carrying loads with different masses. All of these boxcars are going to be stopped by plowing through a large number of these secured ropes. All of the boxcars need to be stopped in the same distance.

Rank these situations from greatest to least on the basis of the strength of the forces that will be needed to stop the boxcars in the same distance. That is, put first the boxcar on which the strongest force will have to be applied to stop it in x meters, and put last the boxcar on which the weakest force will be applied to stop the boxcar in the same distance.



Greatest 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ Least

Or, all boxcars require the same force. _____

Please carefully explain your reasoning.

How sure were you of your ranking? (circle one)

Basically Guessed

Sure

Very Sure

1 2 3 4 5 6 7 8 9 10

⁵⁶ T. O’Kuma