Assignment 9

Due on 06/09/14 - Unit 08

Instructions:

Please submit your assignment in a clear and concise manner. Make sure to include all necessary details and calculations. Any graphs or diagrams should be labeled appropriately. Good luck!

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A. A beam has a Young's Modulus of E = 200 GPa. If the beam is 5 meters long and has a cross-sectional area of A = 0.01 m², and a force of F = 1000 N is applied to one end, what is the resulting displacement? (Assume no rotational restrictions)

B. A 10 kg block is hanging from a spring with a spring constant of k = 100 N/m. Initially, the block is at rest. What is the displacement of the spring when the block is given a downward force of 20 N?

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C. A mass of 5 kg is attached to a spring with a spring constant of k = 50 N/m. The mass is initially at rest and then given a downward force of 10 N. What is the resulting displacement of the mass?

D. A 20 kg object is attached to a spring with a spring constant of k = 200 N/m. The object is initially 1 meter above the ground and then released. What is the maximum height reached by the object?

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E. A 15 kg object is attached to a spring with a spring constant of k = 150 N/m. The object is initially 2 meters above the ground and then released. What is the maximum height reached by the object?

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F. A 25 kg object is attached to a spring with a spring constant of k = 250 N/m. The object is initially 3 meters above the ground and then released. What is the maximum height reached by the object?

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G. A 30 kg object is attached to a spring with a spring constant of k = 300 N/m. The object is initially 4 meters above the ground and then released. What is the maximum height reached by the object?

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H. A 35 kg object is attached to a spring with a spring constant of k = 350 N/m. The object is initially 5 meters above the ground and then released. What is the maximum height reached by the object?