MECH 364: MECHANICAL VIBRATIONS
MIDTERM EXAMINATION 1

Time: 45 minutes   26th January 2010   Maximum Available Mark: 20

Q1.

a) Draw the free body diagram (FBD) for the bar PQ and the mass m in Fig.(1) **(10 marks)** by choosing appropriate co-ordinate(s) for the bar PQ and the mass m. Indicate ALL relevant forces including reactions in your FBDs. The bar PQ is assumed to be rigid and of negligible mass and inertia.

b) Using the FBDs in part a), write the Single Degree of Freedom (SDOF) equation **(10 marks)** of motion that governs the oscillations of the mass m in Fig.(1). *You may use Newton's second law or D'Alembert's principle.*
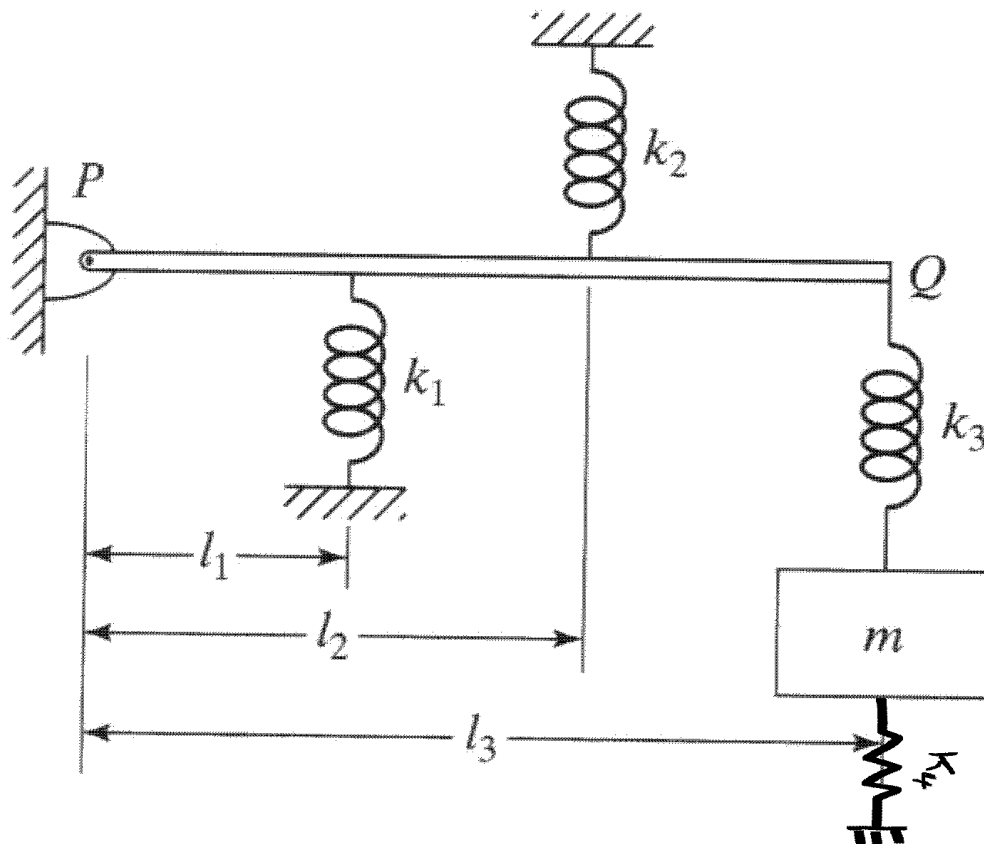

Figure 1: The bar PQ has negligible inertia.

ALL THE BEST!