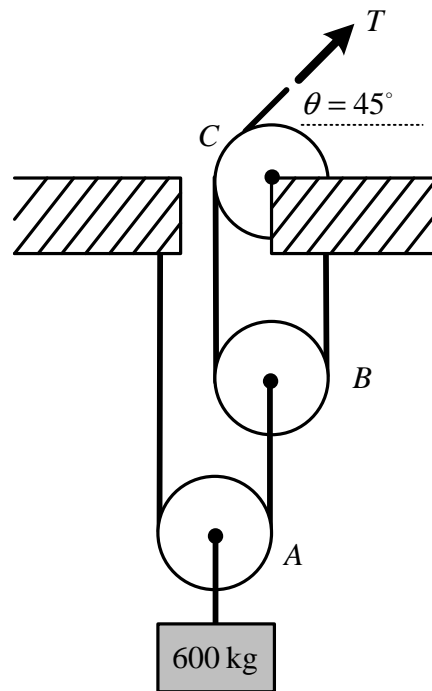1. Calculate the tension T in the cable that supports the 500-kg mass with the pulley arrangement shown. Each pulley is free to rotate about its bearing, and the weights of all parts are small compared with the load. Find the magnitude of the total force on the bearing of pulley C. (25%)

2. The cantilever beam is subjected to the load intensity (force per unit length) which varies as $w = w_0 \sin(\pi x/l)$. Determine the shear force V and bending moment M as functions of the ratio x/l. (25%)
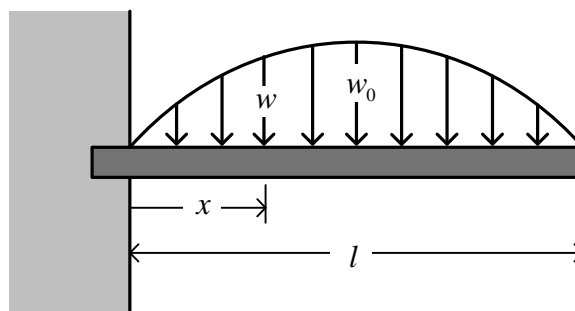
3. Explain the following items: (25%)

   a) What are the research contents of "Statics"?

   b) What is the definition of "Rigid Body" ?

   c) What is the definition of "Couple Force" ?

   d) What is the definition of "Centroid of a Rigid Body" ?

4. Please draw the free-body diagram of member BC, then determine the resultant force acting-at the end of B. (25%)