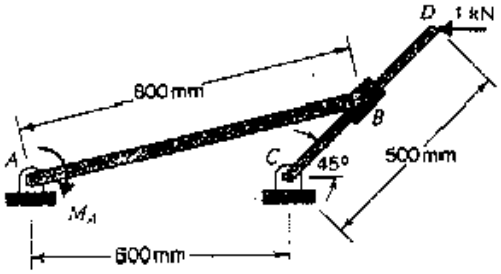
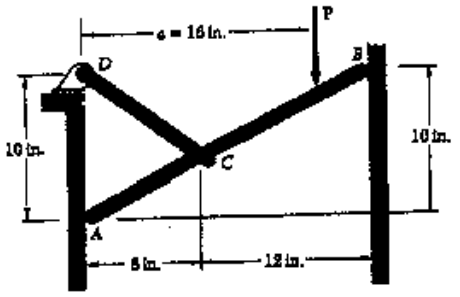
國立中央大學九十一學年度轉學生入學試題卷

機械工程學系　三年級　科目：應用力學　共 1 頁 第 1 頁

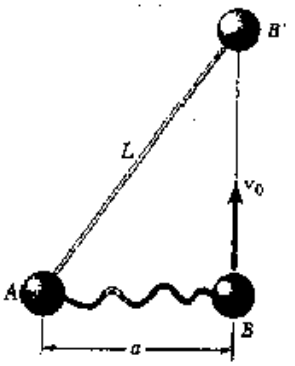
1. Bar *AB* is pinned at end *B* to a collar that may slide over the smooth bar *CD*. Determine the couple M_A required for static equilibrium of the system under the 1 kN loading shown. Also, determine the corresponding pin reactions at end *A*. (25%)



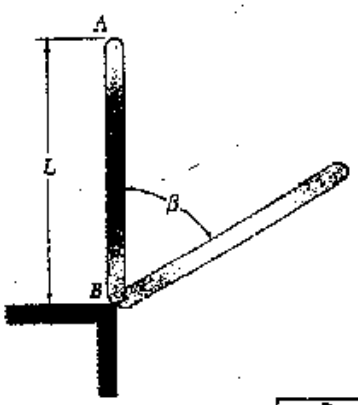
2. A vertical load P of magnitude 300 lb is applied to member *AB*. Member *AB* is placed between two smooth walls and is pin-connected at *C* to a link *CD*. Determine all forces exerted on member *AB*. (25%)



3. Two identical spheres *A* and *B*, each of mass *m*, are attached to an inextensible inelastic cord of length *L*, and are resting at a distance *a* from each other on a frictionless horizontal surface. Sphere *B* is given a velocity v_0 in a direction perpendicular to line *AB* and moves without friction until it reaches *B'* when the cord becomes taut. Determine (a) the magnitude of the velocity of each sphere immediately after the cord has become taut, (b) the energy lost as the cord becomes taut. (25%)



4. A uniform slender rod is placed at corner *B* and is given a slight clockwise motion. Assuming that the corner is sharp and becomes slightly embedded in the end of the rod, so that the coefficient of static friction at *B* is very large, determine (a) the angle β through which the rod will have rotated when it loses contact with the corner, (b) the corresponding velocity of end *A*. (25%)



參考用