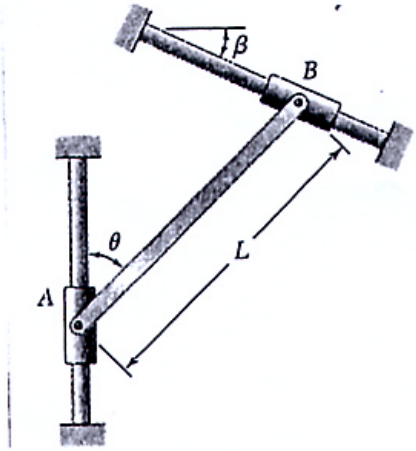
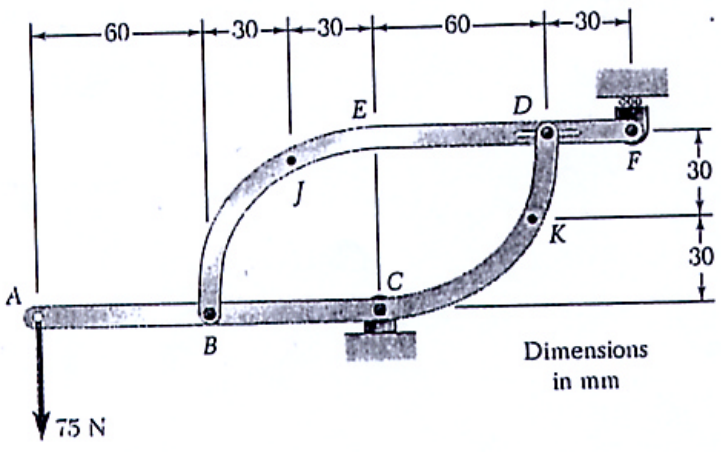
Ph. D. Qualified Examine Statics Oct. 2005

1. A slender rod of length L, mass m is attached to collars which may slide freely along the guides as shown. Knowing that the rod is in equilibrium, (a) derive an expression for the angle θ in terms of the angle β, (b) the reactions at A and B. (25 %)



2. Two members, each consisting of a straight and a quarter-circular portion of rod, are connected as shown and support a 75N load at A. Determine, (a) the reactions at B, C, D, F (b) internal force at point J. (25 %)



941 Semester Ph.D. Qualifying Exam: Dynamics

Student Name:_____Student I.D.#: _____

1. The crank OA rotates in the vertical plane with a constant clockwise angular velocity ω_o of 4.5 rad/sec. For the position where OA is horizontal, determine
   (a) the angular velocity of the slender bar AB
   (b) the angular acceleration of bar AB
   (c) the acceleration of the mass center G of bar AB
   (d) the force under the light roller B of the 10-kg slender bar AB.