淡江大學九十一學年度碩士班招生考試試題

系別：航空太空工程學系　　科目：動 力 學

准帶項目請打「○」否則打「×」	
計算機	字典
○	×

1. A uniform bar of weight W is simply supported at A and B (see *Figure* 1). If the support at B is suddenly removed, determine the angular acceleration of the bar **and** the reaction at A. (25%)

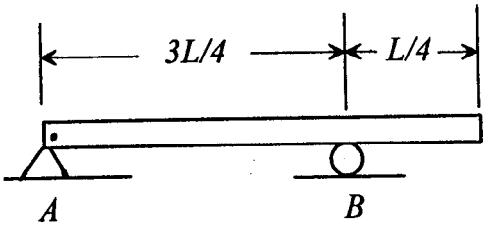

Figure 1.

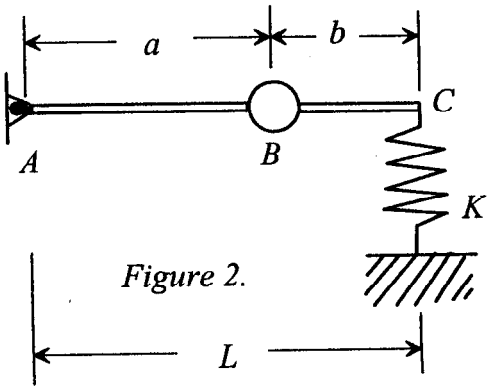

Figure 2.

2. A ball B of weight W_B is attached to a rod of weight W (see *Figure* 2). Find the natural frequency of vibration in terms of K, a, L, W, W_B, and g. (25%)

3. Determine the angular velocity ω and angular acceleration α of link OA in terms of the velocity v and acceleration a of slider B and the angle θ as shown in *Figure* 3. (25%)

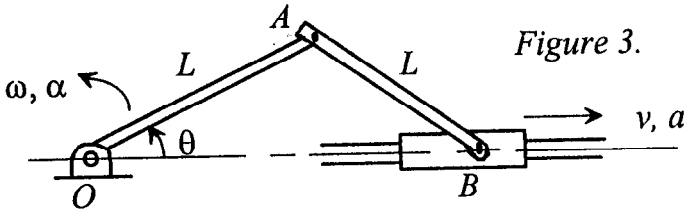

Figure 3.

4. One end of a light inextensible string is attached to a particle of mass 0.1 *kg* resting on a frictionless table. The other end of the string passes through a small hole O on the table. Initially the particle is swung (搖擺) with angular velocity 2 *rad/sec* at radius r = 50 *cm*, keeping the string taut (拉緊). If the string is slowly pulled through the hole until the rotating radius of the particle become 10 *cm*, what is the resulting angular velocity? (15%) Determine the corresponding tension T in the string. (10%)