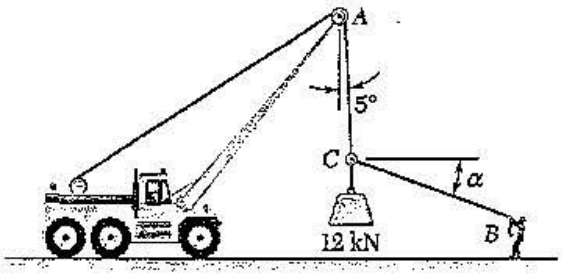
元智大學 103 學年度研究所 **碩士班** 招生試題卷

系(所)別：機械工程學系碩士班　組別：乙組　科目：應用力學　用紙第 1 頁共 2 頁

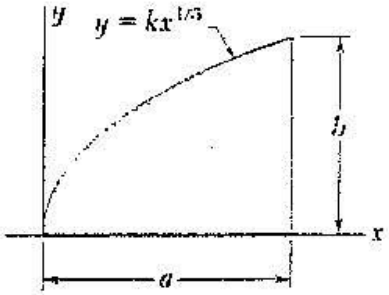
●不可使用電子計算機　（盡量作答，請勿空白）

1. According to your understanding, what are the differences between the subjects of "Statics" and "Dynamics"? List the basic equilibrium equations for "Statics" and "Dynamics" respectively. (20%)

2. For the situation described in the figure, determine (a) the value of α for which the tension in rope BS is as small as possible, (b) the corresponding value of the tension. (20%)



3. Determine by direct integration the moment of inertia of the shaded area with respect to the y axis. (20%)



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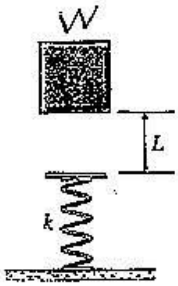
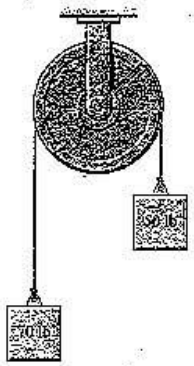
4. The weight W as shown is dropped from a distance L onto a spring with stiffness of k. The spring is initially unstressed. Determine the distance L from which the weight must be dropped to produce a maximum compressive force in the spring that is 10 times the weight of the block. Express L in terms of the W and k. (20 %)



5. Two weights ($W_1 = 70$ lb and $W_2 = 50$ lb) are connected as shown by a cord passing without slipping through a disk. The radius and weight of the disk are 2 ft and 40 lb, respectively. Neglecting the mass of the cord, determine the angular acceleration of the disk and the acceleration of the weights W_1 and W_2. Moment of inertia for the disk $I_o = \frac{1}{2}mr^2$ (20 %)



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