

淡江大學九十一學年度碩士班招生考試試題

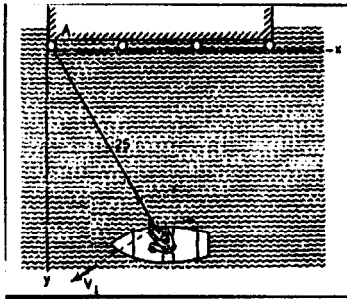
系列：運輸管理學系

科目：力 學 (含動力學、靜力學)

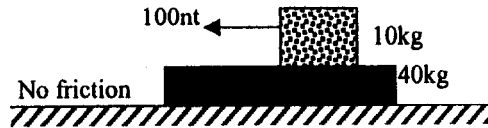
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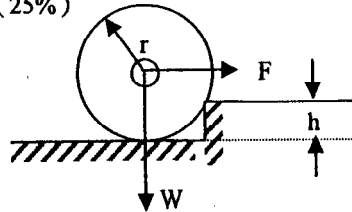
1. A boat containing a man totally weighting 350lb is moving near a dock. He throws out a light line and lassos a piling on the dock at A. He starts drawing in on the line so that when he is in the position shown in the figure, the line is taut and has a length 25 ft. His speed V_1 is 5 ft/sec in a direction normal to the line. If the net horizontal force F on the boat from tension in the line and from water resistance is maintained at 50 lb essentially in the direction of the line, what is the component of his velocity toward piling A after the man has pulled in 3 ft of line? (25%)



2. A 40 kg slab rests on a frictionless floor. A 10 kg block rests on top of the slab. The static coefficient of friction between the block and the slab is 0.6 while the kinetic coefficient is 0.4. The 10 kg block is acted upon by a horizontal force of 100 nt. What are the resulting accelerations of the block? (25%)



3. What force F applied horizontally at the axle of the wheel is necessary to raise the wheel over an obstacle of height h ? Take r as the radius of the wheel and W as its weight. (25%)



4. Crank AB of the engine system has a constant clockwise angular velocity of 2000 rpm. For the crank position shown, determine the angular velocity of the connecting rod BD and the velocity of point D. (25%)

