

國立成功大學

111學年度碩士班招生考試試題

編 號：132

系 所：航空太空工程學系

科 目：工程力學

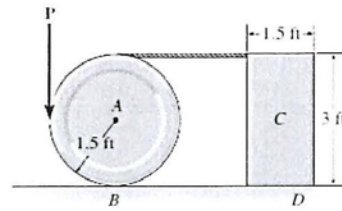
日 期：0219

節 次：第 2 節

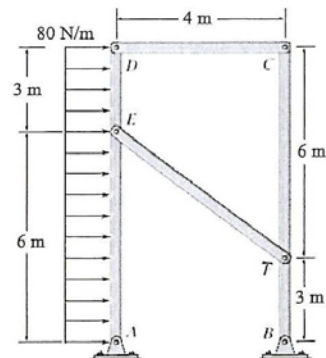
備 註：不可使用計算機

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

- (1) The wheel weighs 60 lb and rests on a surface. A cord wrapped around it is attached to the top of the 90-lb block. If the coefficients of static friction at B and D are $\mu_B = 0.2$ and $\mu_D = 0.3$, respectively. Determine the smallest vertical force that can be applied tangentially to the wheel which will cause motion to impend. (25%)

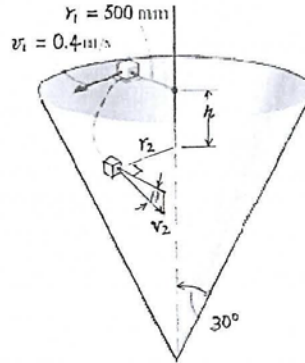


- (2) For the frame shown, determine (i) the forces in members CD and EF , and (ii) the horizontal and vertical components of force which the pins A and B exert on the frame. The weight of each member is neglected. Note: member EF is pinned to members AD and BC . (25%)



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(3) As shown below, A small block having a mass of 0.1 kg is given a horizontal velocity of $v_1 = 0.4 \text{ m/s}$ when $r_1 = 500 \text{ mm}$. It slides along the smooth conical surface. Determine the distance h it must descend for it to reach a speed of $v_2 = 2 \text{ m/s}$. Also, what is the cosine value of the descent angle θ (value of $\cos \theta$), that is, taking cosine of the angle measured from the horizontal to the tangent of the path? (25%)



(4) The 2-kg ball is thrown at the suspended 20-kg block with a velocity of 4 m/s . If the coefficient of restitution between the ball and the block is $e = 0.8$, determine the maximum height h to which the block will swing before it momentarily stops. (25%)

