

系所(組)別：數位機電科技研究所

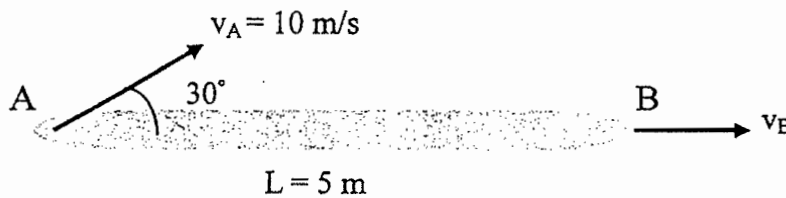
考試科目：動力學

M-7-2

1. If a wheel rolls without slipping, the point of contact with the ground is the instantaneous center of zero velocity at all times. (20%)

A) true B) false

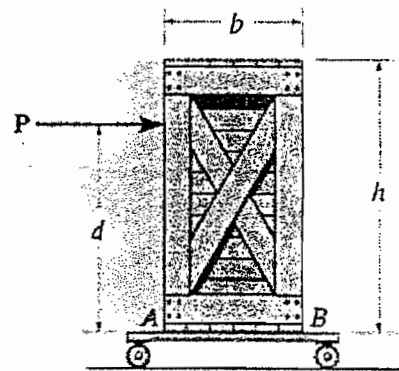
2.



Point A has a velocity of 10 m/s at  $30^\circ$  above the horizontal and point B moves horizontally. What is the angular velocity of the bar? (20%)

A) 0 B) 1 rad/s cw C) 1 rad/s ccw D) 1.732 rad/s cw

3. The crate of mass  $m$  is supported on a cart of negligible mass. Determine the maximum force  $P$  that can be applied a distance  $d$  from the cart bottom without causing the crate to tip on the cart. (30%)



4. The 25-kg slender rod  $AB$  is attached to a spring  $BC$  which has an unstretched length 0.4 m and  $k = 500$  N/m. If the rod is released from rest when  $\theta = 30^\circ$ , determine the angular velocity of the rod the instant the spring becomes unstretched. (30%)

