Phys 218 – Fall 2018

All *University Physics* Sections

Exam III

Short Answer:

A) (i) is true [LO 34.1, 45.1, 48.1]

B) $i)$ R, ~~T~~ [LO 31.1]

$ii)$ ~~R~~, T [LO 31.2]

$iii)$ ~~R~~, ~~T~~ [LO 31.3]

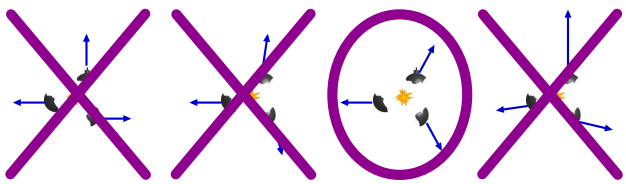
$iv)$ R, T [LO 31.4]

$v)$ R, T [LO 31.5]

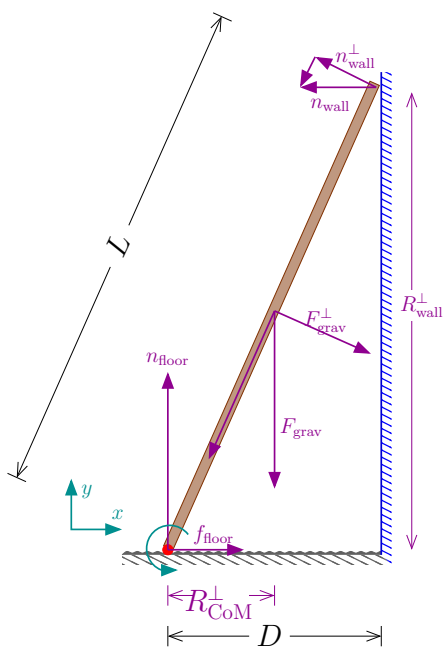
C) (ii) is true [LO 34.2, 35.1]

(v) is true [LO 35.2, 40.1]

(ix) is true [LO 35.3, 40.2]

D)  [LO 2.1, 2.2, 45.2, 46.1, 48.2]

Problem 1: a) [LO 9.1, 23.1, 26.1, 26.2, 29.1, 45.3]



b) $\sum F_x = 0$ and $\sum F_y = 0$, and $\sum \tau = 0$ [LO 21.1, 21.2, 55.1]

c) $n_{\text{wall}} = Mg\left(\dfrac{\frac{1}{2}D}{\sqrt{L^2 - D^2}}\right)$ [LO 1.1, 1.2, 3.1, 54.1, 54.2]

d) $f_{\text{floor}} = n_{\text{wall}} = Mg\left(\dfrac{\frac{1}{2}D}{\sqrt{L^2 - D^2}}\right)$ and $n_{\text{floor}} = Mg$ [LO 3.2, 3.3]

Problem 2: a) $v_f = 3$ m/s [LO 46.2, 46.3, 46.4, 48.3]

b) "Elastic" vs. "inelastic" $\Leftrightarrow$ kinetic energy is vs. is not conserved
$K_i = K_f = 54$ J $\Rightarrow$ "elastic" [LO 34.3, 34.4, 50.1, 50.2, 50.3]

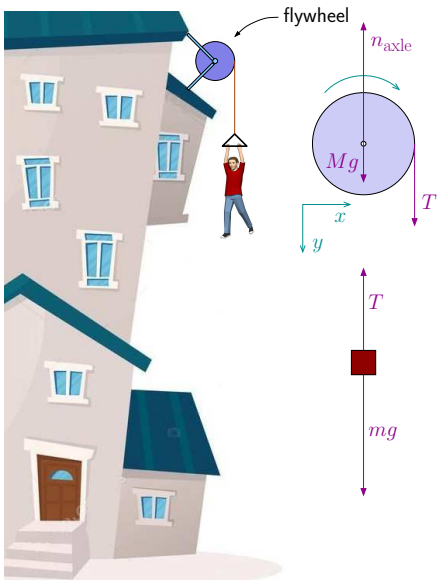
c) $k = 500$ N/m [LO 10.1]

d) $x_{\max} = \sqrt{\frac{81}{500}}$ m [LO 3.4, 34.5, 38.1 40.3]

Problem 3: a) $v_{CM} = \sqrt{\frac{10}{7} g H}$ [LO 4.1, 16.1, 34.6, 35.4, 38.2, 40.4, 51.1]

b) $h = \frac{5}{7} H$ [LO 3.5, 34.7, 35.5, 38.3, 40.5]

Problem 4: a) [LO 9.2, 22.1, 23.2, 23.3, 24.1, 30.1]



b) $T = mg - ma$ [LO 3.6 21.3]

c) $T = \frac{1}{2} M R \alpha$ [LO 3.7, 51.2, 54.3, 55.2]

d) $M = 6m$ [LO 4.2, 16.2, 17.1]