Phys 218 – Fall 2017

All Sections

Exam II

Short Answer:

A) $W = \frac{\alpha}{2}x_0^2 - \frac{\beta}{3}x_0^3 + \frac{\gamma}{4}x_0^4$ [LO 8.1, 32.1]

B) $W = -mgh$ [LO 38.1, 39.1]

C) [LO 23.1, 23.2, 24.1, 24.2, 26.1, 26.2, 26.3, 29.1, 29.2]

D) See the green and magenta colour-coding above [LO 22.1, 22.2]

E) $h = v_0^2/2g$ [LO 3.1, 34.1, 38.2, 40.1]

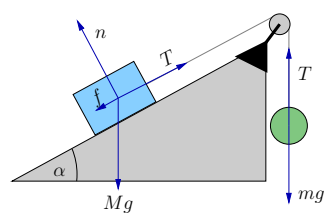
F) $L = v_0^2/2\mu g$ [LO 3.2, 21.1, 28.1, 32.2, 34.2, 39.2]

G) [LO 23.3, 23.4, 24.3, 24.4, 26.4, 26.5, 26.6]

H) See the green colour-coding above [LO 22.3]

Problem 1:

(a) [LO 23.5, 23.6, 24.5, 24.6, 26.7, 29.3]



(b) $T = mg$ [LO 21.2]

(c) $f = (m - M\sin\alpha)g$ down the incline as shown [LO 1.1, 4.1, 21.3]

(d) $a = \frac{m - M(\mu_k\cos\alpha + \sin\alpha)}{m+M}g$ [LO 4.2, 21.4, 21.5, 21.6, 28.2]

(e) $T = mg\left(1 - \frac{m - M(\mu_k\cos\alpha + \sin\alpha)}{m+M}\right)$ [LO 4.3]

Problem 2:

(a) $v = \sqrt{\frac{k}{m}\Delta x^2 - 2g\Delta x\sin\theta}$ [LO 3.3, 34.3, 38.3, 38.4, 40.2]

(b) $K = \frac{1}{2}m\cos^2\theta\left(\frac{k}{m}\Delta x^2 - 2g\Delta x\sin\theta\right)$ [LO 1.2, 3.4, 34.4]

Problem 3:

(a) $W = -\frac{1}{2}mgR$ [LO 3.5, 21.7, 28.3, 32.3]

(b) $H = 3R$ [LO 3.6, 34.5, 38.5, 39.3, 40.3]