

## HPER K530 Biomechanics

### Solutions to old Mid-Term from Fall, 2003

- 1- b  
2- a  
3- c  
4- b  
5-  $W = m \cdot 9.81 = 144 \cdot 9.81 = 1413 \text{ N}$   
6- d  
7- b  
8- b  
9- d  
10-  $a = F/m = 206/75 = 2.75 \text{ m/s}^2$   
11- c  
12- a  
13- c  
14- for  $v_{\text{final}} = 0$ , need  $m \cdot v_{\text{final}} = 0$ , so need  $\Delta m \cdot v = -m \cdot v_{\text{initial}} = -(117 \cdot 6.7) = -784 \text{ Kg} \cdot \text{m/s} = -784 \text{ N} \cdot \text{s}$   
15-  $\Delta m \cdot v = F \cdot t = 237 \cdot 2.3 = 545 \text{ Kg} \cdot \text{m/s}$   
16- a  
17- e  
18-  $T = r \cdot F = (0.34 \cdot \sin 37^\circ) \cdot (23 \cdot 9.81) = 46.2 \text{ N} \cdot \text{m}$   
19-  $t = 350/1.4 = 250 \text{ s}$   
20- a  
21- b  
22- b  
23- b  
24- c  
25- b  
26-  $\omega = v/r = 3.9/0.85 = 4.59 \text{ rad/s}$ ;  $4.59 \text{ rad/s} = 4.59 \text{ rad/s} \cdot 57.3^\circ/\text{rad} = 263^\circ/\text{s}$   
27- meters  
28-  $\omega = H/I = 41/3.87 = 10.59 \text{ rad/s} = 607^\circ/\text{s}$ ;  $t = 360/607 = 0.59 \text{ s}$   
29- b  
30- c.m. =  $\frac{m_1 \cdot x_1 + m_2 \cdot x_2}{m_1 + m_2} = \frac{37 \cdot 1.87 + 17 \cdot 1.24}{37 + 17} = 1.67 \text{ m}$