Quiz 6 November 13, 2003

Energy related quantities:

$w = \langle \mathbf{F} \rangle \cdot \mathbf{s}$: work by force, **F**, acting over displacement, **s**.

$PE = \frac{1}{2} kx^2$: potential energy stored by distorted spring.

$KE = \frac{1}{2} mv^2$: kinetic energy of a mass with speed v.

5. What is the unit for energy?

a) joule b) newton c) kilogram d) meter e) none of these

6. A mass with a 30 J kinetic energy hits a spring, reducing the kinetic energy to 10 J. After the collision, what is the potential energy stored by the spring?

$KE + PE = KE_0; \quad PE = KE_0 - KE = (30 - 10)\ \text{J} = 20\ \text{J}$

a) 10 J b) 20 J c) 30 J d) 40 J e) 50 J

7. A 2 kg mass has a kinetic energy of 400 J. What is the speed of the mass?

$KE = \frac{1}{2} mv^2; \quad v = \sqrt{\frac{2KE}{m}} = \sqrt{\frac{2 \cdot 400\ \text{kg} \cdot \text{m}^2/\text{s}^2}{2\ \text{kg}}} = 20\ \text{m/s}$

a) 10 m/s b) 20 m/s c) 30 m/s d) 50 m/s e) 200 m/s

14. The unit below NOT an equivalent energy unit:

a) 1 N·m

b) 1 (N/m)(m^2)

c) 1 kg·(m/s)

d) 1 kg·$(m/s)^2$

e) none of the above