Physics 212 Homework 1 Dr. Kotowich

Directions: Please complete all problems and show all details of your work with units. If units are missing the problem is incorrect.

1. A 2 kg object is attached to a horizontal spring of force constant K = 5kN/m. The spring is stretched 10 cm from equilibrium and released. Find the following:
2. The frequency
3. The period
4. The amplitude of the motion
5. The maximum velocity
6. The maximum acceleration
7. When does the object first reach its equilibrium position? What is its acceleration at this time?
8. A particle moves in a circle of radius 40 cm with a constant velocity of 80 cm/s. Find the following:
9. The frequency
10. The period of the motion
11. Write an equation for the x-component of the position of the particle as a function of time t, assuming that the particle is on the x-axis at time t = 0.
12. A 1.5 Kg object oscillates with simple harmonic motion of a spring of force constant K = 500 N/m. Its maximum velocity is 70 cm/s.
13. What is the total energy?
14. What is the amplitude of the oscillation?
15. A 1.2 Kg object hanging from a spring of force constant 300 N/m oscillates with a maximum velocity of 30 cm/s.
16. What is its maximum displacement? When the object is at its maximum displacement, find:
17. The total energy of the system
18. The gravitational potential energy
19. The potential energy in the spring. (Keep in mind this would include the gravitational potential energy of the spring as well).