Topics 1-3 Study Guide

I. Things to memorize. The first question on the test will be a blank space where you will be asked to reproduce the following information from memory.

A. Units:

Quantity	SI Unit
frequency (f)	Hz or s^{-1}
period (T)	seconds (s)
angular frequency (ω)	rad/s
wavelength (λ)	meters (m)
wave number (k)	rad/m
spring constant (k_s)	N/m

B. Equations for general simple harmonic motion (SHM)
- $f = \frac{1}{T}$
- $\omega = 2\pi f$

C. Equations for a spring-mass oscillator
- $\omega = \sqrt{\frac{k_s}{m}}$

D. Equations for a simple pendulum
- $\omega = \sqrt{\frac{g}{L}}$

E. Equations for sinusoidal waves
- $y(x,t) = A\sin(kx \pm \omega t + \phi)$
- $k = \frac{2\pi}{\lambda}$

II. Conceptual questions.
- Be able to switch back and forth between f, T, and ω for any of the systems we've studied.
- Demonsrate an understanding of the physical meaning to all of the variables in the equation $y(x,t) = A\sin(kx \pm \omega t + \phi)$.

III. Problem solving.
There will be 1 or 2 questions directly from the HW and 1 or 2 original questions. Topics will include SHM (spring/mass and pendulum), the mathematics of waves, wave interference, and the doppler effect.