STUDY GUIDE

PRESSURE: (Chap 9)
Bernouilli's principle

Simple Harmonic Oscillators:
Restoring Force proportional to distance
Energy, velocity and displacement all make a wave pattern.
Back & forth, up & down, revolution, cycle, wave, swing, all the same
Period: time per cycle
Frequency: 1/Period= cycle per sec = Hertz
In a pendulum: T = 2 pi * sqrt ( length/ g)
In a spring T = 2 pi * sqrt ( m/ k) k is spring constant

MOVING WAVES: (Chap 12)

I. Waves in general:
- A. Definition of wave: disturbance through a medium
- B. Parts of a wave/ measurements of a wave
  - a. crest (high point), trough(low point)
  - b. wavelength(crest to crest), amplitude(1/2 total height),
  - c.frequency(# waves per second), speed (distance per time)
  - d.SPEED: CHANGES WITH TEMPERATURE
- C. Transverse Waves
  - a. Points move perpendicular to wave motion, b. crest, trough
- D. Longitudinal Waves
  - a. Points move with wave motion, b. compression, rarefaction

How does changing these properties affect slinky/rope or water waves?

Remember that Speed = Frequency times Wavelength
Tightness in a rope/Depth of Water >>>>> changes speed

Type of Material >>>>>> changes speed

Changing Frequency>>>>> changes wavelength NOT speed

Changing Amplitude (Strength/Height)>>> does NOT change frequency, wavelength or speed.

REFLECTION:
Waves bounce off a barrier in the opposite direction
REFRACTION:
Waves change direction when they go from one material to another (because of change in speed), like in a wave between two slinkys or from one depth of water to another.

INTERFERENCE: When two waves meet they will either cancel or add up to a stronger one.

STANDING WAVES: when the intereference and the frequency are adjusted so that points or nodes appear not to move.

Wave interactions…. Follow principle of superposition (waves add up)

A wave of .25 cm amplitude with a wavelength of 2 m traveling on a string interferes with a wave of .10 cm amplitude with a wavelength of 4 m traveling the other way on the 4 m long string. (they both were started at the same time). The waves travel 20 m/s.

Sketch a graph of each individual wave for one period.

Sketch a graph of the wave resulting from interference.

Give examples of simple harmonic motion

Describe exactly how to change the period of a pendulum

Describe the factors that affect the speed of a wave spring

Describe how water, pendulum, slinky waves are alike and different.

Graph the acceleration and energy of a spring wave.

Describe how to make a node

Describe the difference between free and closed reflection

Explain the parts of a transverse and longitudinal wave, giving examples.

What is the principle of superposition?

Explain how Bernoulli's principle can be thought of as restating conservation of energy

Describe how airplanes fly, giving the forces and their effect on each other.