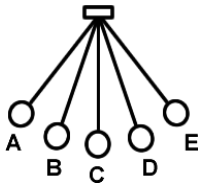
A-Day Due Mon., Feb 2
B-Day: Due Tues., Feb 3

2009 PreAP Harmonic Motion 2

We have to make up some time. Use the book and the "Harmonic Motion Basics" table to answer these questions.

Start on p.446.



1. A pendulum swings thru 40° as it passes from one side to the other. The pendulum takes 0.2 seconds to swing from E to C.
   A. What is its amplitude?
   B. What is the period of this pendulum?
   C. If the mass of the bob is doubled, what will the new period be?
   D. What is the length of the pendulum?
   E. Where will the bob come to rest?
   F. In one cycle, how many times does the pendulum pass the equilibrium position?
   G. What is its frequency?
   H. Since you know its length and its angle, find its amplitude (in meters). (*Think rotational motion, again.)*

2. What are the units for frequency? What does it mean?

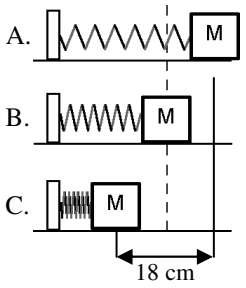
   So, since frequency is in cycles per second, you now have a basic equation for frequency.
3. A spring vibrates back and forth 24 times in 9 seconds.
   A. What is its frequency?

   B. What is its period?

4. Another pendulum swings back and forth 34 times in one minute.
   A. What is its frequency?

   B. What is its period?

A moving spring



5. The diagram shows a spring moving back and forth. The dotted line is the center of motion.
   A. What is the amplitude of the spring?

   B. How far does it move in one cycle?

   C. If it takes 12 N to move it to one side, what is its spring constant?

   D. If it moves back and forth 140 times in one minute, what is its period?

   E. Calculate the mass of the object.

   F. If the mass is switched with a bigger mass, will the period increase (faster) or decrease?
   G. If the spring constant were increased, will the period increase or decrease?

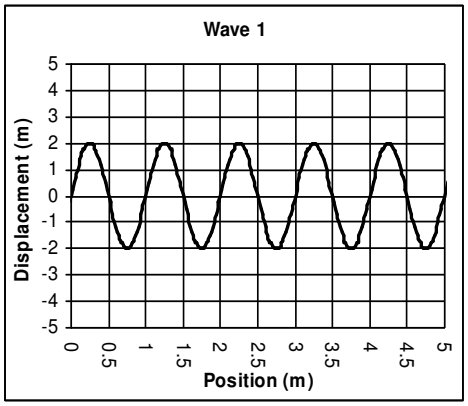
   p. 452 (and the column on waves)
6. If a ball is pushed down into a pool, the ball will begin to oscillate up and down, waves will move out from the ball, but the ball will not move. So, do the particles of water move in wave motion?

7. What is a medium for wave motion?
8. What is the medium for water waves?
9. What is the medium for sound waves in a room?
10. Why can't sound travel thru space?
11. Do all waves require a medium? (Explain and use right words.)

12. Is sound a pulse water or a periodic wave?
    Why?

13. Why is the picture of the wave at the bottom of p. 453 called a sin wave?

14. Use the graph of Wave 1 for the following questions.
    A. What is the amplitude of the wave?
    B. What is its wavelength?
    C. What is its equilibrium position?
    D. Mark a crest with an X.
    E. Mark a trough with a circle.



15. From the book, what is a longitudinal or compression wave?

16. Notes Table: What is rarefaction and compression?

17. Now imagine that Wave 1 is a compression or longitudinal wave.
    A. Which part of the graph represents compression: crests or troughs?
    B. Which part represents rarefaction?

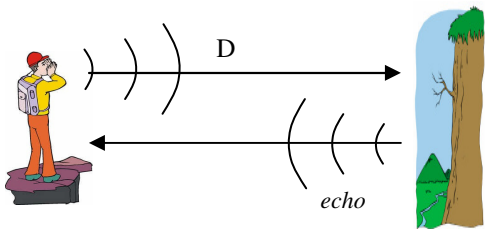
18. Write the equation for speed of a wave. Use arrows to point to each letter and define each letter and give units.

19. If the speed of Wave 1 is 28 m/s, what is its frequency?

20. A wave has a frequency of 120Hz and a wavelength of 9 m.
    A. What is it speed?

    B. What is the basic equation for speed (from week 1, last semester)?

    C. How far does the wave move in 40 seconds?



21. Imagine a boy standing in a canyon. He yells at the opposite wall of the canyon. The speed of sound is approximately 340 m/s.
    A. If the distance to the other side of the canyon is D, how far does the sound actually travel from the boy and back?

    B. If it takes 1.6 seconds from the moment the boy yells for the echo to get back to the boy, how far wide is the canyon?

(*continued on next page*)

22. What is the name of the ability of organisms and cells to maintain a stable internal environment called?

A. Homeostasis
B. Endoplasmic reticulum
C. Photosynthesis
D. Chloroplast

23. In a molecule of DNA, the base thymine always pairs with

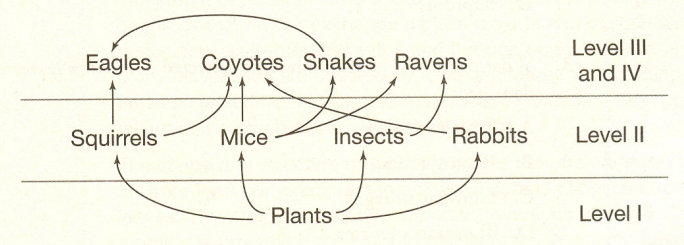
A. Cytosine
B. Guanine
C. Uracil
D. Adenine

24. During transcription, what base pairs with adenine

A. Uracil
B. Thymine
C. Guanine
D. Cytosine

25. What kind of mutation occurred in the following sequence of bases in a DNA molecule?
Original sequence: GAC UAC
Mutation sequence: GAC GUA

A. Deletion
B. Chromosomal
C. Insertion
D. Substitution



26. Use the diagram below to answer.
Which of the following represents an accurate food chain in this ecosystem?

A. Coyotes > rabbits > plants
B. Plants > mice > insects > ravens
C. Plants > mice > snakes > eagles
D. Squirrels > eagles > coyotes

27. P. 470 - Do questions 19, 21, 25, 36.