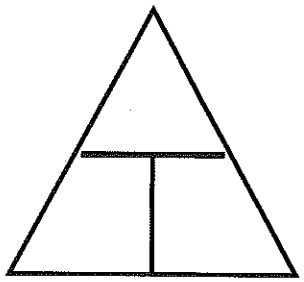
PHYSICS - SELF TEST CH. 2

Name _____

Acceleration of gravity: $g = 10\ m/s^2$

$v = \Delta d/\Delta t$ $a = \Delta v/\Delta t$ $v_f = v_o + at$ $d = 1/2at^2$ $v_{av} = (v_o + v_f)/2$



True or False: Use + for true and 0 for false

___ 1. The rate at which velocity changes is called acceleration.

___ 2. The metric unit of acceleration is meter per second.

___ 3. When a car rounds a corner at constant speed, its acceleration is zero.

___ 4. A stone is thrown straight up into the air. At the highest point, the stone has zero velocity.

___ 5. A stone is thrown straight up into the air. At the highest point, the stone has zero acceleration.

___ 6. As a ball falls freely, its speed remains constant.

Multiple Choice – Pick the best answer

___ 7. Speed is
- a. a measure of how fast something is moving
- b. the distance covered in a unit of time
- c. always measured in terms of a unit of distance divided by a unit of time
- d. all of these

___ 8. When you look at the speedometer in a moving car, you can see the car's:
- a. instantaneous speed
- b. average speed
- c. instantaneous acceleration
- d. average acceleration

___ 9. Suppose you go on a trip that covers 240 km and it takes 4 hours. Your average speed is:
a. 60 km/h b. 120 km/h c. 480 km/h d. 960 km/h

___ 10. Suppose a car is moving in a straight line and its speed is increasing. If the car goes from 35 km/h to 40 km/h in the first second, and from 40 km/h to 45 km/h in the next second, what is the car's acceleration?
a. 5 km/h/s b. 10 km/h/s c. 35 km/h/s d. 40 km/h/s e. zero

___ 11. Which formula is correct?
a. speed = time x distance b. speed = time/distance c. speed = distance/time d. none are correct

___ 12. Which has the greater average speed: a cheetah which sprints 60 yd in 3 s, or a leopard which sprints 90 yd in 6 s?
a. the cheetah b. the leopard c. both the same d. can't tell since the weight of each animal is not given

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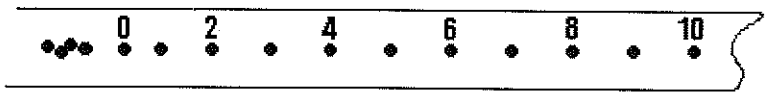
The diagram which shows a tape made in the laboratory is for questions 13 - 15.



___ 13. Between dots 0 and 4 the cart is:
a. speeding up b. slowing down c. going at a constant speed d. stopped

___ 14. Between dots 4 and 8 the cart is:
a. speeding up b. slowing down c. going at a constant speed d. stopped

___ 15. Which represents the longer time interval?
a. between dot 0 and 4 b. between dot 4 and 8 c. both the same

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___ 16. An object is dropped from a tall building. At one instant it is traveling 30 m/s. Exactly one second later its speed is expected to be:
a. 20 m/s b. 30 m/s c. 40 m/s d. 60 m/s

___ 17. The distance that a falling object travels:
- a. is directly proportional to the time of fall.
- b. is inversely proportional to the time of fall.
- c. is directly proportional to the square of time that the object falls.
- d. is proportional to the square root of the time the object falls.

Questions/Problems

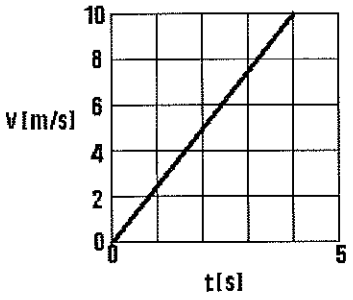
18. This chart below shows information about an object in free fall. Fill in the values for 5 s of fall. **SHOW YOUR WORK.**

t (s)	v (m/s)	d (m)
0	0	0
1	10	5
2	20	20
3	30	45
4	40	80
5	—	—

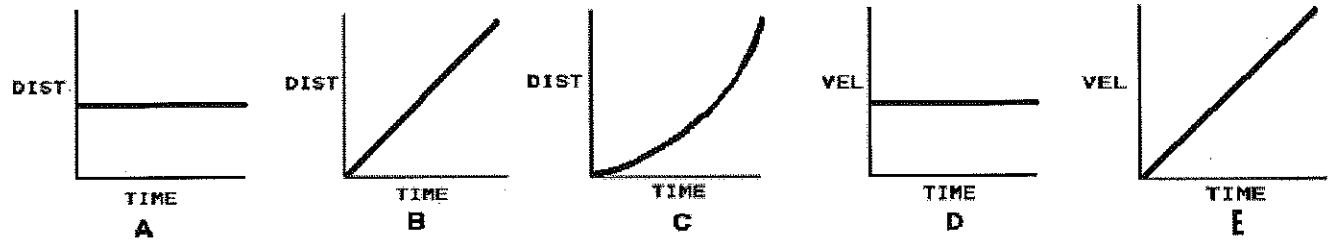
19. A stone is thrown up into the air with a speed of 10 m/s. How many seconds will it take for the stone to return to the ground? Show your work.

20. A car travels at a constant speed of 60 mi/h for 6 minutes. What is the car's acceleration? Explain your answer.

21. Use the speed time graph to the right for this question.
- a. What is the speed when t = 3.0s?
- b. How far did the object go from 0 to 3.0s? Show work.



Questions 22 – 27 refer to the following graphs. Some questions are answered by **more than one** graph. The same graph may be used more than once, and some graphs may not be used.



___ 22. Which graph(s) represent an object whose speed is increasing at a constant rate?

___ 23. Which graph(s) represent an object which is moving at a constant or uniform speed?

___ 24. Which graph(s) show that as time doubles the distance also doubles?

___ 25. Which graph(s) show that as time doubles the speed also doubles?

___ 26. Which graph(s) have a constant slope?

___ 27. Which graph(s) represents an object at rest?

Ch. 2 Self Test - FREE RESPONSE

1. A cheetah maintains a constant speed of 5 m/s. How far will the cheetah travel in 1 minute? Convert your answer to feet.

2. The speedometer of a car moving east down Ogden reads 30 mi/h. It passes another car that is moving west at 30 mi/h.
   a. Do the cars have the same speed? Why/why not?

   b. Do the cars have the same velocity? Why/why not?

3. It takes a car moving in a straight line 5.0 s to increase its speed from 0 to 65 km/h. What is the acceleration of the car?

4. A car starting from rest accelerates at a rate of 8 mi/h/s. How fast will the car be going after 3.0 s?

5. A car starting from rest accelerates at a rate of 4 m/s/s. How fast will the car be going after 3.0 s?

6. It takes a car moving in a straight line 5.0 s to increase its speed from 65 km/h to 90 km/h. What is its acceleration?

7. A rock is dropped off of a very high cliff.

   a. What would be the speedometer reading on the rock 4.5 s after if falls from rest?

   b. What would be the speedometer reading on the rock 10 s after it falls from rest?

8. An apple drops from a tree and hits the ground in 4.0 s.

   a. What is its speed upon striking the ground?

   b. What is its average speed during the 4.0 s?

   c. How high above the ground was the apple when it was dropped?

9. A EPHS basketball player is able to jump to a height of 1.2 m. Calculate the player's "hang time" or rather their total time in the air.

8. A potato gun shoots a potato plug straight up into the air with an initial speed of 30 m/s. ***Make a sketch of this in the space to the right.*** (Use the diagram on Page 18 of your text as a guide.)

   a. How long will the plug be in the air before it reaches its highest point (apex)?

   b. How high did the plug go?

   c. How long was the plug airborne?