

Physics First I Cycle 2 Practice Test

- 1) Which of the following is an example of acceleration?
 - a. An object moving at an increasing speed
 - b. An object slowing down, or 'decelerating'
 - c. An object moving in a circle at a uniform speed
 - d. All of the above

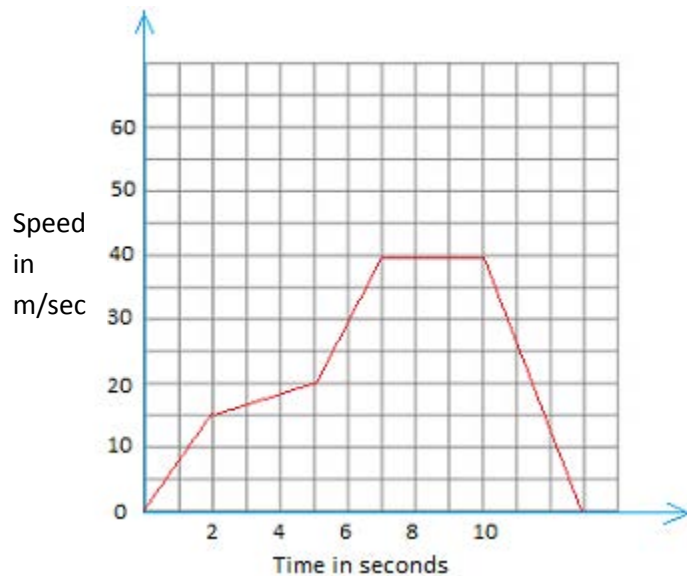
- 2) A spring is compressed in a vise. The spring exerts a force of 200 N on the vise. Which of the following statements is true in this situation?
 - a. The spring pushes on the floor with a force of 200 N
 - b. The floor pushes upward onto the spring with a force of 200 N
 - c. The vise does not push on the spring
 - d. The vise jaws exert a force of 200 N on the spring

- 3) A force of 1 kilogram meter per seconds squared is equal to
 - a. The force of gravity on a 1 kilogram mass
 - b. The speed of an object accelerated with a force of 1 N
 - c. One Newton (1 N)
 - d. The acceleration of an object in free fall

- 4) You are riding a bicycle and slam on the brakes. This causes you to have to grip the bike tightly to avoid going over the handlebars. This is because of
 - a. Newton's First Law of Inertia
 - b. Gravitational force
 - c. The large mass of the bicycle
 - d. The pedals, chain, and gears

- 5) Acceleration is
 - a. Displacement changing over time
 - b. Velocity changing over time
 - c. Mass changing over time
 - d. None of the above

The graph below represents the speed-time relationship for a 20 kilogram mass moving along a horizontal frictionless surface.



- 6) According to the figure above, what is the speed of the 20 kilogram mass when the time equals 5 seconds?
- 10 m/sec
 - 20 m/sec
 - 30 m/sec
 - 40 m/sec
- 7) According to the figure above, when is acceleration of the mass equal to zero?
- 0 seconds to 2 seconds
 - 2 seconds to 5 seconds
 - 5 seconds to 7 seconds
 - 7 seconds to 10 seconds
 - 10 seconds to 13 seconds
 - At both 0 seconds and 13 seconds
- 8) The inertia of an object depends upon
- Its mass
 - Its acceleration
 - Its speed
 - All of the above

- 9) When an object is falling, it reaches terminal velocity when
- Air resistance starts to slow the object down
 - The velocity equals 9.8 m/sec
 - The air resistance equals the force of gravity
 - The acceleration becomes negative
- 10) A diver steps off of a high-dive board and hits the water 4 seconds later. How high was the diving board? Hint: $d = V_{AVG} * t$, $V_{AVG} = (V_i + V_f)/2$
- 19.6 m
 - 39.2 m
 - 78.4 m
 - 156.8 m
- 11) An object is in free fall when it is
- Subjected to gravity and no other forces
 - Resting on the ground
 - At terminal velocity
 - Changing direction
- 12) A cannon shoots a cannonball straight up into the air at a velocity of 120 m/sec. At its highest point
- The ball is resting on the ground
 - The ball has an acceleration of 0 m/sec²
 - The ball has a velocity of 0 m/sec
 - The velocity has a negative value
- 13) The acceleration due to gravity, 'g', is
- 9.8 m
 - 9.8 m/sec
 - 9.8 m/sec²
 - 9.8 m³/sec
- 14) If an object moves at a constant velocity at a constant speed
- There must be a force acting on the object pushing in the direction of its travel
 - The object must eventually stop
 - There must be no net force acting on the object
 - The net force acting on the object must equal 9.8 N

15) You are coasting up a hill on a skateboard. Your velocity is 18 miles/hour as you just reach the hill. After 3 seconds, your velocity is now 3 miles/hour. Your acceleration was

- a. -6 mph/sec
- b. -15 mph/sec
- c. -4 mph/sec
- d. -5 mph/sec

16) An object with a mass of 10 kg feels a gravitational force of

- a. $10 \text{ kg} * 9.8 \text{ m/sec}^2$
- b. $10 \text{ kg} + 9.8 \text{ m/sec}^2$
- c. $10 \text{ kg} \div 9.8 \text{ m/sec}^2$
- d. $10 \text{ kg} - 9.8 \text{ m/sec}^2$

17) Which of the following is a unit of velocity?

- a. cm/sec^2
- b. sec^2/cm
- c. cm^2/sec
- d. sec/cm^2

18) A cannonball is launched straight up at an initial velocity of 98 m/sec. The instant that it reaches its highest point, it is eaten by a dragon. How long will it take to reach its highest point?

- a. 0.1 sec
- b. 1 sec
- c. 10 sec
- d. 100 sec

19) What is the average velocity of the cannonball in the previous problem?

- a. 9.8 m/sec
- b. 9.8 m/sec^2
- c. 49 m/sec
- d. 98 m/sec

20) The dragon from problem [18] was flying at a height of

- a. 490 m
- b. 980 m
- c. 49 m
- d. 98 m

- 21)** “An object in motion, stays in motion” is one way to state
- a. Newton’s First Law
 - b. Newton’s Second Law
 - c. Newton’s Third Law
 - d. The law of averages

- 22)** One Newton is equal to
- a. 1 kg/m
 - b. 1 kg/sec²
 - c. 1 kg*m
 - d. 1 kg*m/sec²

What are our preferred metric units for these measurements?

- | | | | | |
|------------------------------|-------------|-----------------------|-------------|-----------|
| 22-1) Mass | a. Kilogram | b. Newton | c. Meter | d. Pound |
| 22-2) Distance | a. Second | b. Meter | c. Kilogram | d. Newton |
| 22-3) Speed(velocity) | a. Newton | b. m/sec ² | c. m/sec | d. kg*m |
| 22-4) Acceleration | a. Newton | b. m/sec ² | c. m/sec | d. kg*m |
| 22-5) Force | a. Newton | b. m/sec ² | c. m/sec | d. kg*m |

- 23)** What would happen to your weight if you travelled to the Moon?
- a. It would increase
 - b. It would stay the same
 - c. It depends on your original weight
 - d. It would decrease

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- 25)** If an object is accelerating it must
- a. Have zero inertia
 - b. Accelerate at -9.8 m/sec²
 - c. Be subject to a net force of zero
 - d. Be subject to a nonzero net force

- 26)** The rate of change of velocity of an object with time is
- Speed
 - Position (distance)
 - Acceleration
 - Free fall
- 27)** A skydiver falls for 20 seconds. What is her final velocity?
- 9.8 m/sec
 - 98 m/sec
 - 49 m/sec
 - 196 m/sec
- 28)** A skydiver free-falls until she is falling at 100 m/sec. How long did it take for her to achieve this velocity?
- 10.2 sec
 - 9.8 sec
 - 0.96 sec
 - 100 sec
- 29)** A man is pushing a heavy 100 kg box with a force of 200 N. The frictional force resisting him has a magnitude of 180 N. The acceleration of the box is
- 0.5 m/sec²
 - 2 m/sec²
 - 0.2 m/sec²
 - 3.8 m/sec²