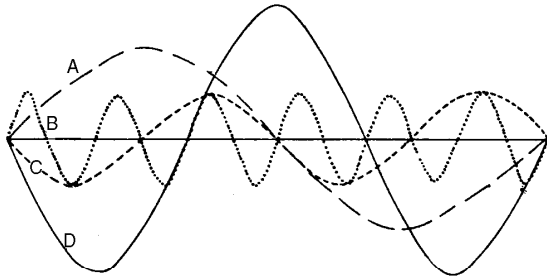


This test is a review of your knowledge on the Wave Theory section. Remember a score of 70% or higher, is required to pass. Good Luck!

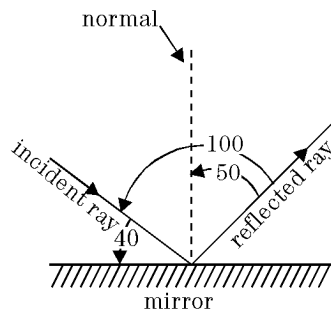
1. The diagram shown represents four waves traveling to the right in the same transmitting medium.



Which type of wave is represented?

- A. elliptical B. longitudinal
 C. torsional D. transverse
2. The diagram here represents a light ray being reflected from a plane mirror. From the data given in the diagram, what is the angle of reflection?

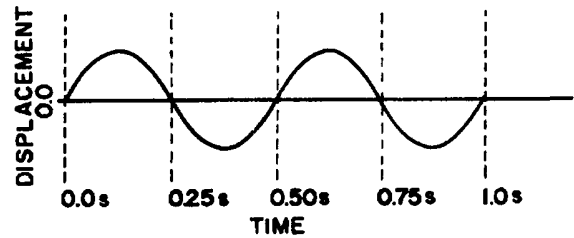
- F. 10°
 G. 40°
 H. 50°
 J. 100°



3. The number of waves passing a point in a unit of time is called

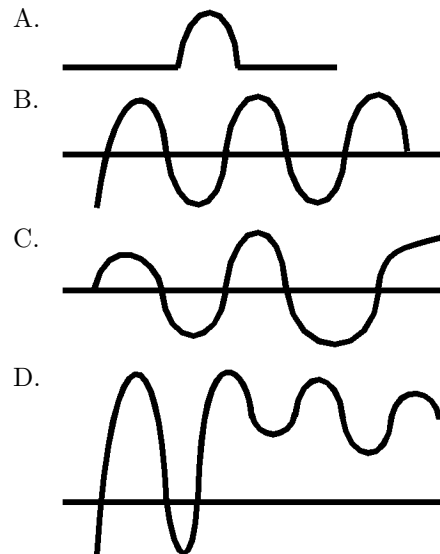
- A. frequency B. wavelength
 C. amplitude D. period

4. The graph represents the displacement of a point in a medium as a function of time as a wave passes through the medium. What is the frequency of the wave?



- F. $\frac{1}{2}$ Hz G. 2 Hz H. $\frac{1}{4}$ Hz J. 4 Hz

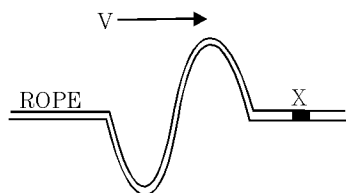
5. Which diagram best represents a periodic wave traveling through a uniform medium?



6. The speed of a transverse wave in a string is 12 meters per second. If the frequency of the source producing this wave is 3.0 hertz, what is its wavelength?

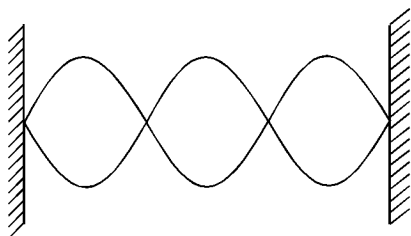
- F. 0.25 m G. 2.0 m H. 36 m J. 4.0 m

7. As shown in the diagram, a transverse wave is moving along a rope. In which direction will segment X move as the wave passes through it?



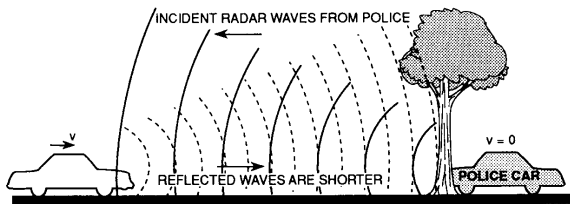
- A. down, only B. up, only
 C. down, then up D. up, then down

8. How many nodes are represented in the standing wave diagram?



- F. 1 G. 6 H. 3 J. 4

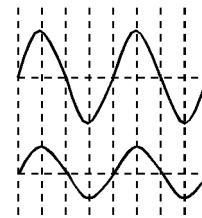
9. The diagram pictured shows radar waves being emitted from a stationary police car and reflected by a moving car back to the police car. The difference in apparent frequency between the incident and reflected waves is an example of



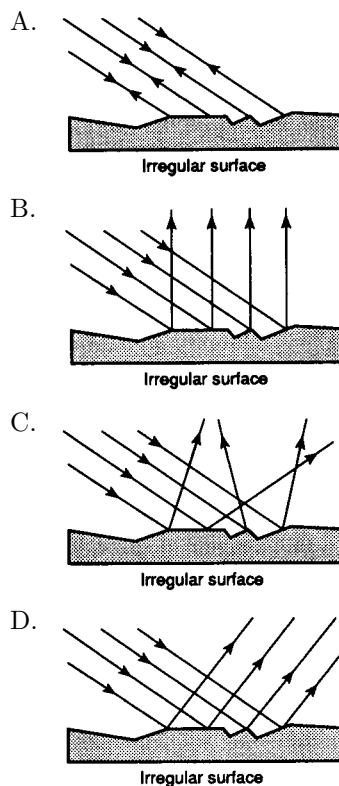
- A. constructive interference
 B. refraction
 C. the Doppler effect
 D. total internal reflection

10. The diagram shows two waves traveling in the same medium for the same length of time. The two waves have different

- F. amplitudes
 G. frequencies
 H. speeds
 J. wavelengths



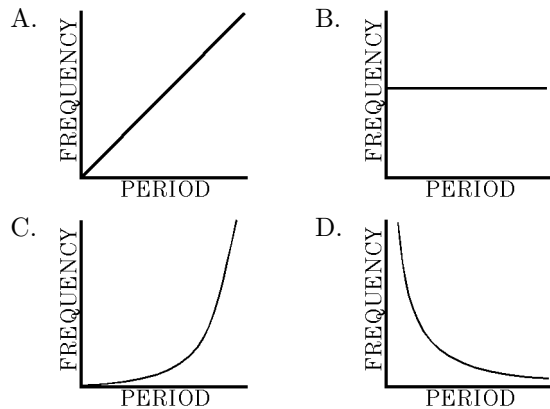
11. Which diagram best represents the reflection of light from an irregular surface?



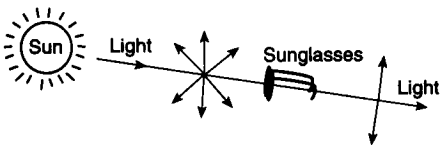
12. Two points on a transverse wave that have the same magnitude of displacement from equilibrium are in phase if the points also have the

- F. same direction of displacement and the same direction of motion
- G. same direction of displacement and the opposite direction of motion
- H. opposite direction of displacement and the same direction of motion
- J. opposite direction of displacement and the opposite direction of motion

13. Which graph best represents the relationship between the frequency and period of a wave?

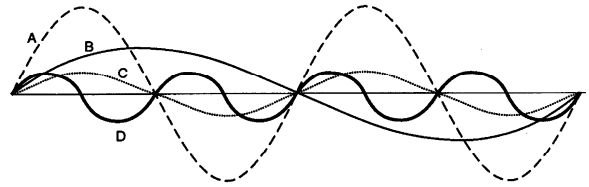


14. The diagram shows sunglasses being used to eliminate glare. Which phenomenon of light is represented in the diagram?



- F. dispersion
- G. diffraction
- H. internal reflection
- J. polarization

15. Base your answer(s) to the following question(s) on the diagram, which represents waves A, B, C, and D traveling in the same medium.



Which two waves shown here have the same wavelength?

- A. A and B
- B. A and C
- C. B and D
- D. C and D

Answer List

- | | | |
|-------|-------|-------|
| 1. D | 2. H | 3. A |
| 4. G | 5. B | 6. J |
| 7. D | 8. J | 9. C |
| 10. F | 11. C | 12. F |
| 13. D | 14. J | 15. B |

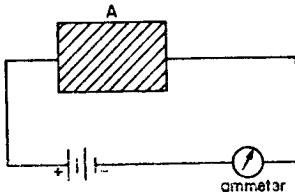
Catalog List

- | | | |
|----------------|----------------|----------------|
| 1. NY7 DA 2 | 2. NY7 DA 16 | 3. NY7 DA 33 |
| 4. NY7 DA 39 | 5. NY7 DA 44 | 6. NY7 DA 57 |
| 7. NY7 DA 69 | 8. NY7 DA 79 | 9. NY7 DA 83 |
| 10. NY7 DA 93 | 11. NY7 DA 100 | 12. NY7 DA 103 |
| 13. NY7 DA 105 | 14. NY7 DA 107 | 15. NY7 DA 122 |

Week of April 21–25

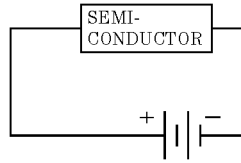
Monday

What will occur if the battery connection to a semiconductor *A* shown in the diagram is reversed?

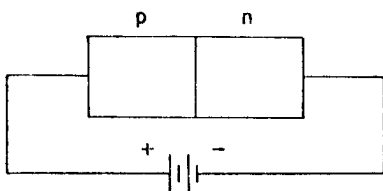


Tuesday

What permits current to flow through a semiconductor when it is connected to a battery as shown in the diagram?

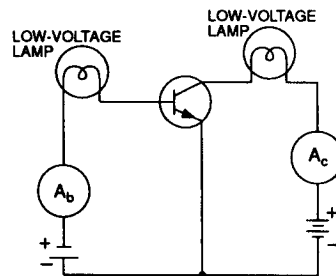


Wednesday



What will occur in the *p-n* junction diode shown here?

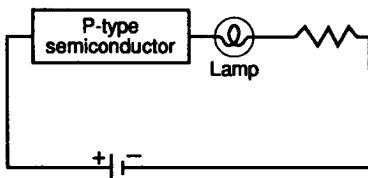
Thursday



The diagram shown represents an operating *N-P-N* transistor circuit. Ammeter A_c reads the collector current and ammeter A_b reads the base current. Compared to the reading of ammeter A_c , the reading of ammeter A_b is





Friday

The circuit diagram shows a *P*-type semiconductor in series with a lamp, a resistor, and a battery. What would increase the current in the circuit?



Read each question carefully. Circle the number that corresponds with the correct answer. This exam will count for 25% of your quarter grade.

- (1) A blinking light of constant period is situated on a lab cart. Which diagram best represents a photograph of the light as the cart moves with constant velocity?

1. 
2. 
3. 
4. 

- (2) Which is a scalar quantity

1. displacement
2. distance
3. force
4. acceleration

- (3) A student walks 40 meters along a hallway that heads due north, then turns and walks 30 meters along another hallway that heads due east. What is the magnitude of the student's resultant displacement?

1. 10 m
2. 35 m
3. 50 m
4. 70 m

- (4) How long will it take an object to move 100 meters if the object is traveling with an average speed of 0.5 meter per second?

1. 200 sec
2. 2 sec
3. 5 sec
4. 50 sec

- (5) A cart starting from rest travels a distance of 3.6 meters in 1.8 seconds. The average speed of the cart is

1. 0.20 m/s
2. 2.0 m/s
3. 0.50 m/s
4. 5.0 m/s

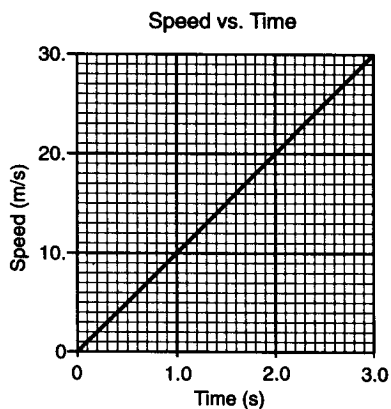
- (6) An object, starting from rest, accelerates at a rate of 3.0 meters per second² for 6.0 seconds. The velocity of the object at the end of this time is

1. 0.50 m/s
2. 2.0 m/s
3. 3.0 m/s
4. 18 m/s

- (7) A car moving at a speed of 8.0 meters per second enters a highway and accelerates at 3.0 meters per second². How fast will the car be moving after it has accelerated for 56 meters?

1. 24 m/s
2. 20 m/s
3. 18 m/s
4. 4.0 m/s

- (8) The graph represents the relationship between speed and time for a car moving in a straight line. The magnitude of the car's acceleration is



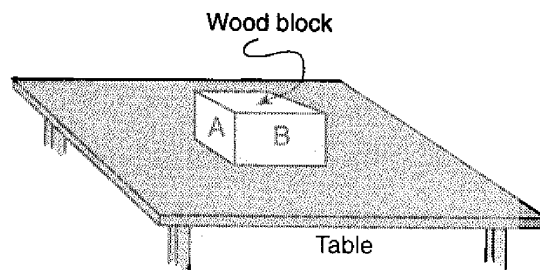
1. 1.0 m/s^2
2. 0.10 m/s^2
3. 10 m/s^2
4. 0.0 m/s^2

- (9) An unbalanced force of 20 newtons is applied to a 4.0-kilogram mass at rest. The acceleration of the object is closest to

1. 0.20 m/sec^2
2. 5.0 m/sec^2
3. 80 m/sec^2
4. 4.0 m/sec^2

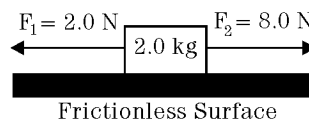
- (10) In the diagram shown, surface *B* of the wooden block has the same texture as surface *A*, but twice the area of surface *A*.

If force F is required to slide the block at constant speed across the table on surface *A*, approximately what force is required to slide the block at constant speed across the table on surface *B*?



1. F
2. $2F$
3. $\frac{1}{2}F$
4. $4F$

- (11) Two forces are applied to a 2.0-kilogram block on a frictionless, horizontal surface, as shown in the diagram. The acceleration of the block is



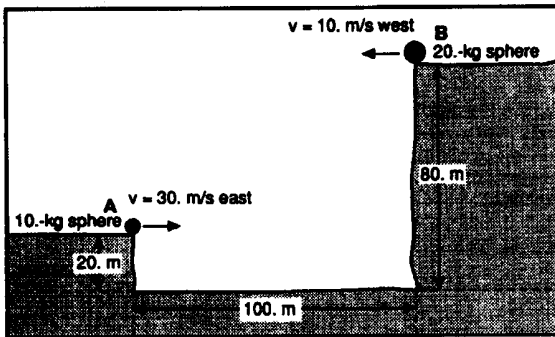
1. 5.0 m/s^2 to the right
2. 5.0 m/s^2 to the left
3. 3.0 m/s^2 to the right
4. 3.0 m/s^2 to the left

- (12) A cannon fires a projectile at an angle with the horizontal. The horizontal component of the projectile's initial velocity is 866 meters per second and its initial vertical component is 500 meters per second. [Neglect air resistance.]

The maximum height to which the projectile rises is approximately

1. 2.50×10^3 m
2. 1.28×10^4 m
3. 1.54×10^4 m
4. 4.42×10^4 m

-
- (13) In the diagram shown, a 10-kilogram sphere, *A*, is projected horizontally with a velocity of 30 meters per second due east from a height of 20 meters above level ground. At the same instant, a 20-kilogram sphere, *B*, is projected horizontally with a velocity of 10 meters per second due west from a height of 80 meters above level ground. [Neglect air friction.]



Initially, the spheres are separated by a horizontal distance of 100 meters. What is the horizontal separation of the spheres at the end of 1.5 seconds?

1. 15 m
2. 30 m
3. 40 m
4. 45 m

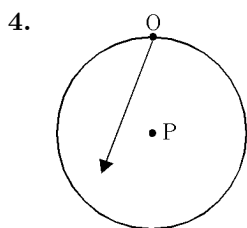
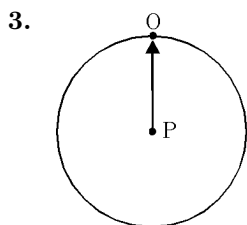
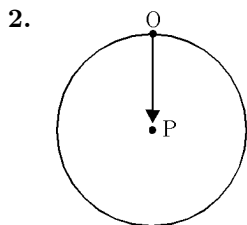
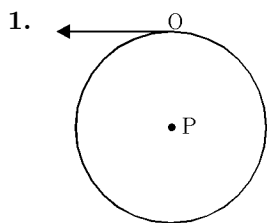
- (14) A cannon elevated at an angle of 35° to the horizontal fires a cannonball, which travels the path shown in the diagram. [Neglect air resistance and assume the ball lands at the same height above the ground from which it was launched.]



If the angle of elevation of the cannon is decreased from 35° to 30° , the vertical component of the ball's initial velocity will

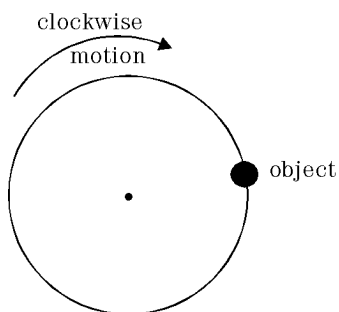
1. decrease and its horizontal component will decrease
2. decrease and its horizontal component will increase
3. increase and its horizontal component will decrease
4. increase and its horizontal component will increase

- (15) If object O is moving in a uniform circular motion around point P at constant speed, which vector shown represents a centripetal force?

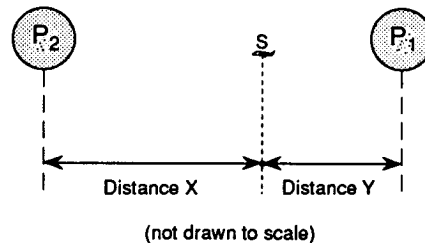


- (16) The diagram shows an object traveling clockwise in a horizontal, circular path at constant speed. Which arrow best shows the direction of the centripetal acceleration of the object at the instant shown?

1. ←
2. →
3. ↓
4. ↑



- (17) Spacecraft S is traveling from planet P_1 toward planet P_2 . At the position shown, the magnitude of the gravitational force of planet P_1 on the spacecraft is equal to the magnitude of the gravitational force of planet P_2 on the spacecraft.



If distance X is greater than distance Y , then the mass of P_1 must be

1. less than the mass of P_2
2. greater than the mass of P_2
3. equal to the mass of P_2

- (18) A reaction engine ejects hot gases in order to produce thrust. This is an example of conservation of

1. mass
2. charge
3. energy
4. momentum

- (19) A 0.025-kilogram bullet is fired from a rifle by an unbalanced force of 200 newtons. If the force acts on the bullet for 0.1 second, what is the maximum speed attained by the bullet?

1. 5 m/s
2. 20 m/s
3. 400 m/s
4. 800 m/s

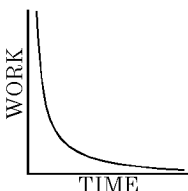
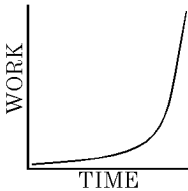
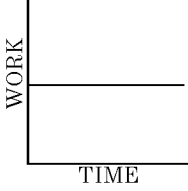
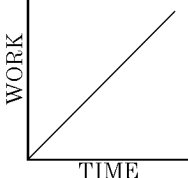
(20) In a baseball game, a batter hits a ball for a home run. Compared to the magnitude of the impulse imparted to the ball, the magnitude of the impulse imparted to the bat is

1. less
2. greater
3. the same

(21) A garden tractor drags a plow with a force of 500 newtons a distance of 10 meters in 20 seconds. How much work is done?

1. 25 joules
2. 1,000 joules
3. 2,500 joules
4. 5,000 joules

(22) A student running up a flight of stairs increases her speed at a constant rate. Which graph best represents the relationship between work and time for the student's run up the stairs?

1. 
2. 
3. 
4. 

(23) A 100-kilogram person acquires a velocity of 15 meters per second down a ski slope. What is the skier's kinetic energy?

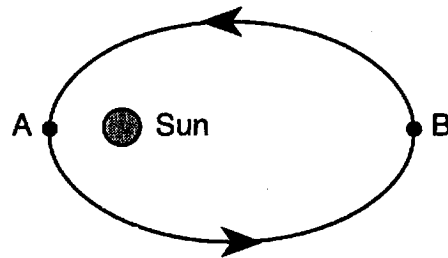
1. 22,500 joules
2. 11,250 joules
3. 1,500 joules
4. 115 joules

(24) What is the spring constant of a spring of negligible mass which gained 8 joules of potential energy as a result of being compressed 0.4 meter?

1. 100 N/m
2. 50 N/m
3. 0.3 N/m
4. 40 N/m

(25) The diagram shown represents the path of a planet in an elliptical orbit around the Sun.

As the planet moves from point A to point B, what changes occur in its speed and kinetic energy?



1. Both speed and kinetic energy decrease.
2. Both speed and kinetic energy increase.
3. Speed decreases and kinetic energy increases.
4. Speed increases and kinetic energy decreases.

Answer List

- | | | |
|-------|-------|-------|
| 1. 3 | 2. 2 | 3. 3 |
| 4. 1 | 5. 2 | 6. 4 |
| 7. 2 | 8. 3 | 9. 2 |
| 10. 1 | 11. 3 | 12. 2 |
| 13. 3 | 14. 2 | 15. 2 |
| 16. 1 | 17. 1 | 18. 4 |
| 19. 4 | 20. 3 | 21. 4 |
| 22. 2 | 23. 2 | 24. 1 |
| 25. 1 | | |

Catalog List

- | | | |
|---------------|---------------|---------------|
| 1. NY7 BA 2 | 2. NY7 BA 3 | 3. NY7 BA 7 |
| 4. NY7 BB 6 | 5. NY7 BB 16 | 6. NY7 BC 10 |
| 7. NY7 BC 21 | 8. NY7 BC 40 | 9. NY7 BD 4 |
| 10. NY7 BD 61 | 11. NY7 BD 55 | 12. NY7 BE 3 |
| 13. NY7 BE 36 | 14. NY7 BE 43 | 15. NY7 BF 31 |
| 16. NY7 BF 65 | 17. NY7 BF 84 | 18. NY7 BG 5 |
| 19. NY7 BG 31 | 20. NY7 BG 40 | 21. NY7 BH 3 |
| 22. NY7 BH 28 | 23. NY7 BI 2 | 24. NY7 BI 29 |
| 25. NY7 BI 75 | | |