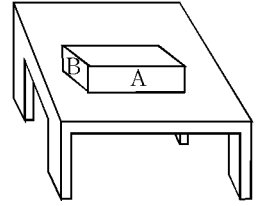


Final Exam Review - Mult Ch.

1. Which is a scalar quantity
 - a) displacement
 - b) distance
 - c) force
 - d) acceleration
2. A group of bike riders took a 4.0 hour trip. During the first 3.0 hours, they traveled a total of 50 kilometers, but during the last hour they traveled only 10 kilometers. What was the group's average speed for the entire trip?
 - a) 15 km/hr
 - b) 30 km/hr
 - c) 40 km/hr
 - d) 60 km/hr
3. A car accelerates uniformly from rest to a speed of 10 meters per second in 2 seconds. The acceleration of the car is
 - a) 0.2 m/sec^2
 - b) 5 m/sec^2
 - c) 10 m/sec^2
 - d) 20 m/sec^2
4. An object starting from rest accelerates at a rate of 3.0 meters/seconds squared for 6.0 seconds. The velocity of the object at the end of this time is
 - a) 0.50 m/s
 - b) 2.0 m/s
 - c) 3.0 m/s
 - d) 18 m/s
5. An object near the surface of planet X falls freely from rest and reaches a speed of 12.0 meters per second after it has fallen 14.4 meters. What is the acceleration due to gravity on planet X ?
 - a) 2.50 m/s^2
 - b) 5.00 m/s^2
 - c) 9.80 m/s^2
 - d) 10.0 m/s^2
6. A clam dropped by a sea gull takes 3.0 seconds to hit the ground. What is the sea gull's approximate height above the ground at the time the clam was dropped?
 - a) 15 m
 - b) 30 m
 - c) 45 m
 - d) 90 m
7. A boat initially traveling at 10 meters per second accelerates uniformly at the rate of 5.0 meters per second² for 10 seconds. How far does the boat travel during this time?
 - a) 50 m
 - b) 250 m
 - c) 350 m
 - d) 500 m
8. If an unbalanced force of 12 newtons acts on a 6-kilogram mass, the acceleration of the mass is
 - a) 0.5 m/sec^2
 - b) 2 m/sec^2
 - c) 10 m/sec^2
 - d) 72 m/sec^2
9. As the unbalanced force exerted on an object is increased, the object's acceleration will
 - a) decrease
 - b) increase
 - c) remain the same
10. Which unbalanced force acting on a 4.0-kilogram object will produce an acceleration of 8.0 m/sec^2 ?
 - a) 32 newtons
 - b) 2.0 newtons
 - c) 0.50 newtons
 - d) 4 newtons
11. An unbalanced force of 2 newtons applied to a given mass produces an acceleration. If an unbalanced force of 1 newton is applied to the same mass, the acceleration produced will be
 - a) the same
 - b) twice as much
 - c) one-half as much
 - d) four times as much

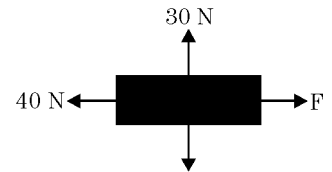
12. In the diagram shown, surface A of the wooden block has twice the area of surface B . If it takes F newtons to keep the block moving at constant speed across the table when it slides on surface A , what force is needed to keep the block moving at constant speed when it slides on surface B ?

a) F b) $2F$ c) $\frac{1}{2}F$ d) $4F$



13. Four forces are acting on an object as shown in the diagram. If the object is moving with a constant velocity, the magnitude of force F must be

a) 0 N b) 20 N c) 100 N d) 40 N



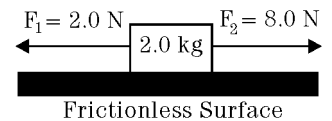
14. A box decelerates as it moves to the right along a horizontal surface, as shown in the diagram. Which vector best represents the force of friction on the box?

a) \downarrow b) \uparrow c) \longrightarrow d) \longleftarrow



15. 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

a) 5.0 m/s^2 to the right b) 5.0 m/s^2 to the left
c) 3.0 m/s^2 to the right d) 3.0 m/s^2 to the left

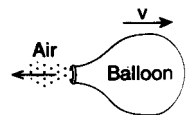


16. A 3.0-kilogram mass weighs 15 newtons at a given point in the Earth's gravitational field. What is the magnitude of the acceleration due to the gravity at this point?

a) 45 m/s^2 b) 9.8 m/s^2 c) 5.0 m/s^2 d) 0.20 m/s^2

17. As shown in the diagram, an inflated balloon released from rest moves horizontally with velocity v . The velocity of the balloon is most likely caused by

a) action-reaction b) centripetal force
c) gravitational attraction d) rolling friction



18. Within a vacuum, the property common to all electromagnetic waves is their

a) amplitude b) frequency c) wavelength d) velocity

19. Which characteristic is determined by the source of a wave and will not change when the wave passes into another medium?

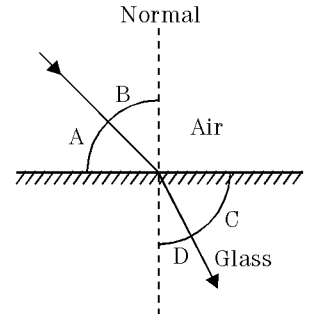
a) frequency b) wavelength c) velocity d) amplitude

39. A prism disperses white light, forming a spectrum. The best explanation for this phenomenon is that different frequencies of visible light
- move at different speeds in the prism
 - are reflected inside the prism
 - are absorbed inside the prism
 - undergo constructive interference inside the prism

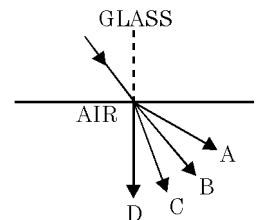
40. What occurs when light passes from water into flint glass?
- Its speed decreases, its wavelength becomes smaller, and its frequency remains the same.
 - Its speed decreases, its wavelength becomes smaller, and its frequency increases.
 - Its speed increases, its wavelength becomes larger, and its frequency remains the same.
 - Its speed increases, its wavelength becomes larger, and its frequency decreases.

41. The speed of light in a material is 2.5×10^8 meters per second. What is the absolute index of refraction of the material?
- 1.2
 - 2.5
 - 7.5
 - 0.83

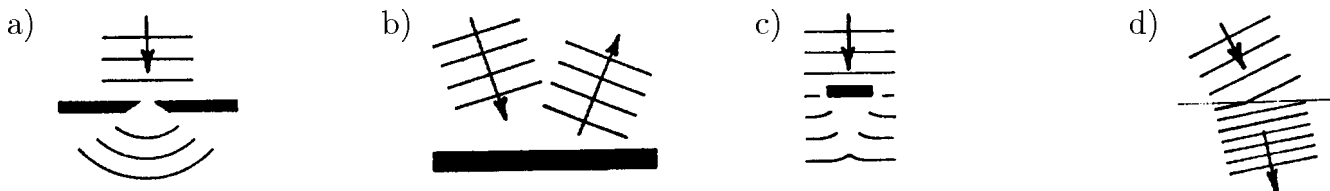
42. The diagram shows a ray of light being refracted as it passes from air into glass. Which letter represents the angle of refraction for the light ray?
- A
 - B
 - C
 - D



43. A ray of light emerges from a glass block into air as shown in the diagram. Which path would the light ray take?
- A
 - B
 - C
 - D

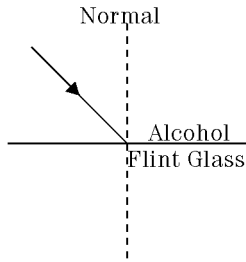


44. Which diagram best illustrates wave refraction?

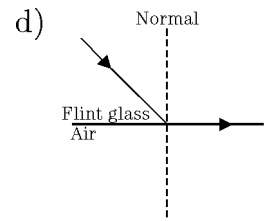
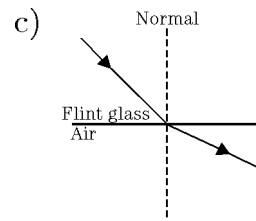
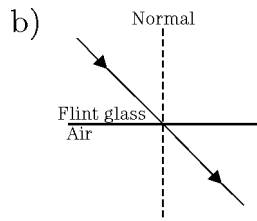
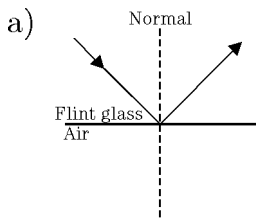


51. The diagram shows a ray of monochromatic light incident on an alcohol-flint glass interface.

What occurs as the light travels from alcohol into flint glass?



- a) The speed of the light decreases and the ray bends toward the normal.
 b) The speed of the light decreases and the ray bends away from the normal.
 c) The speed of the light increases and the ray bends toward the normal.
 d) The speed of the light increases and the ray bends away from the normal.
52. A ray of monochromatic light is traveling in flint glass. The ray strikes the flint glass-air interface at an angle of incidence greater than the critical angle for the flint glass. Which diagram best represents the path of this light ray?



53. How does the speed of a mechanical wave change in a uniform rope if you increase the frequency?

- a) Speed increases
 b) Speed decreases
 c) Speed remains the same
 d) Speed depends on amplitude
54. As the tension in a spring increases, the speed _____.
- a) increases b) decreases c) remains the same d) accelerates
55. An observer hears a frequency 3.75×10^5 Hz. The source frequency is 5.97×10^4 Hz. Which one of the following best describes the situation?
- a) The source is moving faster than the speed of sound.
 b) The separation between the source and the observer is increasing.
 c) The separation between the source and the observer is decreasing.
 d) The observer is stationary.

56. A fighter plane is travelling at $\frac{2}{3}$ the speed of sound and approaches a stationary observer. What is the ratio of f_o to f_s ?
- a) $\frac{3}{1}$ b) $\frac{2}{3}$ c) $\frac{3}{2}$ d) $\frac{1}{3}$
57. What fraction of the speed of sound must an object be travelling if a stationary observer detects a frequency 4.5 times higher than the source frequency?
- a) $\frac{9}{7}$ b) $\frac{5}{7}$ c) $\frac{7}{5}$ d) $\frac{7}{9}$
58. An echo is heard 3.5 s later. What is the distance to the cliff if the air temperature is 0.0°C ?
- a) 579 m b) 1159 m c) 290 m d) 680 m
59. A sonic boom is heard when _____.
- a) an object makes a loud sound.
b) two objects approach each other very quickly.
c) an object travels slower than the local speed of sound.
d) an object travels faster than the local speed of sound.
60. What electromagnetic wave carries with it the most energy?
- a) X-rays. b) Radio. c) Yellow light. d) Microwaves.
61. Which one of the following waves has the longest wavelength?
- a) Gamma rays b) Radio waves c) Infrared waves. d) Ultraviolet waves.
62. Light is traveling from water to Plexiglas, what is the largest possible angle of refraction?
- a) 61.7° b) 28.3°
c) 90.0° d) total internal reflection occurs
63. In zircon, green light has a wavelength of 273 nm and index of refraction of 1.92. What is the wavelength of green light in air?
- a) 364 nm b) 273 nm c) 142 nm d) 524 nm
64. How many times faster does light travel in fused quartz than in diamond?
- a) 0.603 b) 1.66 c) 2.42 d) 0.960
65. In which one of the following does light travel the fastest?
- a) Glycerin b) Zircon c) Plexiglas d) Ruby

Answer List

- | | | | |
|-------|-------|-------|-------|
| 1. b | 2. a | 3. b | 4. d |
| 5. b | 6. c | 7. b | 8. b |
| 9. b | 10. a | 11. c | 12. a |
| 13. d | 14. d | 15. c | 16. c |
| 17. a | 18. d | 19. a | 20. a |
| 21. c | 22. a | 23. b | 24. a |
| 25. d | 26. c | 27. b | 28. b |
| 29. a | 30. c | 31. d | 32. a |
| 33. c | 34. b | 35. b | 36. b |
| 37. d | 38. b | 39. a | 40. a |
| 41. a | 42. d | 43. a | 44. d |
| 45. c | 46. c | 47. c | 48. b |
| 49. a | 50. c | 51. a | 52. a |
| 53. c | 54. a | 55. c | 56. a |
| 57. d | 58. a | 59. d | 60. a |
| 61. b | 62. a | 63. d | 64. b |
| 65. a | | | |