Physics 112

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) $0.2\,\mathrm{m/sec^2}$ b) $5\,\mathrm{m/sec^2}$ c) $10\,\mathrm{m/sec^2}$ d) $20\,\mathrm{m/sec^2}$

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) $2.50\,\mathrm{m/s^2}$ b) $5.00\,\mathrm{m/s^2}$ c) $9.80\,\mathrm{m/s^2}$ d) $10.0\,\mathrm{m/s^2}$

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 second^2 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) $0.5\,\mathrm{m/sec^2}$ b) $2\,\mathrm{m/sec^2}$ c) $10\,\mathrm{m/sec^2}$ d) $72\,\mathrm{m/sec^2}$

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 $8.0\,\mathrm{m/sec^2}$?

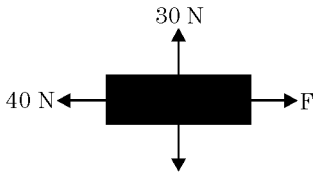
    a) 32 newtons b) 2.0 newtons c) 0.50 newtons d) 4 newtons

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. 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



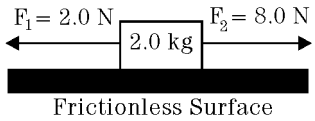
13. A box decelerates as it moves to the right along a horizontal surface, as shown in the diagram. Which vector best represents the force of friction on the box?

a) ↓ b) ↑ c) ⟶ d) ⟵

14. 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



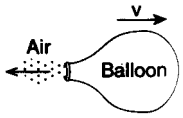
15. A 3.0-kilogram mass weighs 15 newtons at a given point in the Earth's gravitational field. What is the magnitude of the acceleration due to the gravity at this point?

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

16. 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



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

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

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

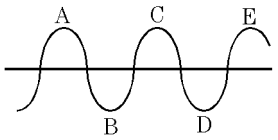
a) frequency b) wavelength c) velocity d) amplitude

19. Periodic waves are being produced in a ripple tank. As the rate at which the waves are produced is increased, the wavelength of the waves will

a) decrease b) increase c) remain the same

20. In the wave diagram shown, one wavelength is the distance from point A to which point?

a) E b) B c) C d) D



21. Two waves have the same frequency in a medium. The wave with the greater energy has the greater

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

22. If the velocity of a constant-frequency wave increases, the wavelength

a) decreases b) increases c) remains the same

23. Water drips from a faucet at the rate of 150 drops in 120 seconds. What is the period?

a) 0.80 sec b) 1.3 sec c) 75 sec d) 300 sec

24. If the displacement of particles in a medium is parallel to the direction of travel of the wave, the wave is classified as

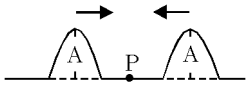
a) electromagnetic b) torsional c) transverse d) longitudinal

25. What is the period of a wave with a frequency of 2.0×10^2 hertz?

a) 6.0×10^{-10} s b) 2.0×10^{-3} s c) 5.0×10^{-3} s d) 1.5×10^{6} s

26. The diagram shown represents a rope along which two pulses of equal amplitude, A, approach point P. When the two pulses meet at P, the vertical displacement of the rope at point P will be

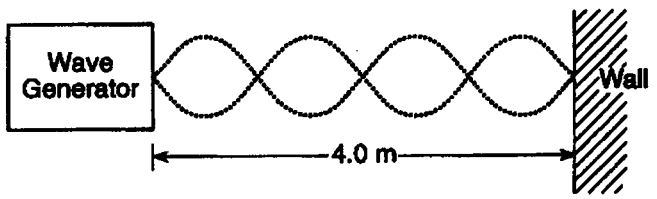
a) A b) $2A$ c) 0 d) $\frac{A}{2}$



27. A wave generator located 4.0 meters from a reflecting wall produces a standing wave in a string, as shown in the diagram.

If the speed of the wave is 10 meters per second, what is its frequency?

a) 0.40 Hz b) 5.0 Hz c) 10 Hz d) 40 Hz



28. A term often used to describe the frequency of a sound is

a) amplitude b) volume c) pitch d) tone

29. An opera singer's voice is able to break a thin crystal glass if the singer's voice and the glass have the same natural

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

30. The speed of sound in air on a day when the temperature is 20° C will be

a) 316 m/sec b) 330 m/sec c) 344 m/sec d) 358 m/sec

31. The loudness of a sound is dependent upon which wave property?

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

32. A tuning fork of 256 vibrations per second is sounded in air at 20.0° C. The wavelength of the sound produced is

a) 0.744 m b) 1.34 m c) 12.8 m d) 344 m

33. In general, compared to the speed of sound through air, the speed of sound through liquids and solids is

a) slower b) faster c) the same

34. Sound can *not* be transmitted through a

a) gas b) liquid c) solid d) vacuum

35. 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

36. As the tension in a spring increases, the speed _____.

a) increases b) decreases c) remains the same d) accelerates

37. An echo is heard 3.5 s later. What is the distance to the cliff is the air temperature is 0.0° C?

a) 579 m b) 1159 m c) 290 m d) 680 m

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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. d
13. d	14. c	15. c	16. a
17. d	18. a	19. a	20. c
21. a	22. b	23. a	24. d
25. c	26. b	27. b	28. c
29. a	30. c	31. b	32. b
33. b	34. d	35. c	36. a
37. a			