Physics, 9e **(Giambattista)**
Chapter 1   Introduction

1) A student of physics watching the *Star Wars* films knows that according to the laws of physics
A) the Rebel heroes can see the flash of an explosion in space.
B) the Rebel heroes can hear the sound of an explosion in space.
C) the Rebel heroes can communicate using their radios in space.
D) the Rebel heroes can see the flash of an explosion in space AND the Rebel heroes can communicate using their radios in space.
E) the Rebel heroes can see the flash of an explosion in space AND the Rebel heroes can hear the sound of an explosion in space.

Answer: D
Type: MC
Topic: Talking Physics
Accessibility: Keyboard Navigation
Chapter: 01

2) In everyday language, speed and velocity are synonyms, but in physics
A) velocity has only magnitude.
B) speed has only direction.
C) velocity has magnitude and direction.
D) speed has magnitude and direction.
E) velocity has only direction.

Answer: C
Type: MC
Topic: Talking Physics
Accessibility: Keyboard Navigation
Chapter: 01

3) In everyday language, power and force are similar, but in physics
A) force has only magnitude.
B) power has only direction.
C) force has magnitude and direction.
D) power has magnitude and direction.
E) None of these answers are correct.

Answer: C
Type: MC
Topic: Talking Physics
Accessibility: Keyboard Navigation
Chapter: 01

4) Algebraic symbols in physics equations represent physical quantities, therefore
A) the symbols represent numbers only.
B) the symbols represent numbers and units.
C) the symbols consist of units only.
D) the symbols are only abstract.
E) the symbols are only imaginary.

Answer: B
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

5) The last page of a book is numbered 814 and the book is 3.00 cm thick. What is the average thickness of each page?
A) 2.54×10^3 cm
B) 2.54×10^{-3} cm
C) 7.37×10^{-3} cm
D) 3.92×10^{-3} cm

Answer: C
Type: MC
Topic: Approximation
Accessibility: Keyboard Navigation
Chapter: 01

6) The diameter of a circle is doubled. By what factor is the area changed?
A) $\sqrt{2}$
B) 2
C) 4
D) $\sqrt{4}$
E) 1

Answer: C
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

7) The radius of a circle is increased by 5%. The percentage increase of the circumference is
A) 5%.
B) 10%.
C) 12%.
D) 16%.

Answer: A
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

8) The radius of a circle is increased by 5%. The percentage increase of the area is about
A) 5%.
B) 10%.
C) 12%.
D) 16%.

Answer: B
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

9) The radius of a circle is tripled. By what factor is the area changed?
A) 3
B) 6
C) 9
D) 12

Answer: C
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

10) What is the percentage increase in area when ordering a 14 inch rather than a 12 inch pizza?
A) 16%
B) 26%
C) 36%
D) 46%

Answer: C
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

11) By what approximate factor is a 12 inch pizza larger in area than a 10 inch pizza?
A) 1.2
B) 1.1
C) 1.4
D) 1.6

Answer: C
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

12) If the surface area of a sphere increased by a factor of 3, by what factor did the radius of the sphere change?
A) 1.14
B) 1.73
C) 2.00
D) 2.24

Answer: B
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

13) If the surface area of a sphere is increased by 16%, by what percentage has the radius been changed?
A) 16%
B) 8.1%
C) 7.7%
D) 12%

Answer: C
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

14) The volume of a sphere is 8.00 m^3. The radius of the sphere is
A) 1.24 m.
B) 2.00 m.
C) 2.65 m.
D) 3.00 m.

Answer: A
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

15) The radius of a sphere is 2.00 m. The surface area of the sphere is
A) 36.7 m^2.
B) 50.3 m^2.
C) 72.5 m^2.
D) 75.0 m^2.

Answer: B
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

16) By what factor does the volume of a cube increase if the lengths of the edges are doubled?
A) 2
B) 4
C) 6
D) 8

Answer: D
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

17) By what factor does the volume of a cube increase if the lengths of the edges are tripled?
A) 6
B) 9
C) 3
D) 27

Answer: D
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

18) The side of a cube is decreased by 6%. The percentage decrease of the volume of the cube is
A) 6%.
B) 9%.
C) 12%.
D) 17%.

Answer: D
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

19) If the length of a box is reduced by one-third and the width and height are doubled, by what factor has the volume changed?
A) 4/3
B) 2/3
C) 3/4
D) 3/2

Answer: A
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

20) The side of a cube is increased by 5%. The percentage increase of the surface area of the cube is about
A) 5%.
B) 10%.
C) 12%.
D) 16%.
E) 18%.

Answer: B
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

21) The price of gasoline goes up 6% on Monday night and then goes down 7% the following day. What is the net percentage change in the price of gasoline from Monday morning?
A) 1.0%
B) 2.0%
C) −1.4%
D) −1.0%

Answer: C
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

22) 1.0 kilometer equals how many nanometers?
A) 1.0×10^{12}

B) 1.0×10^{6}

C) 1.0×10^{4}

D) 1.0×10^{-3}

Answer: A
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

23) 1.0 centimeter equals how many micrometers?
A) 1.0×10^{12}

B) 1.0×10^{6}

C) 1.0×10^{4}

D) 1.0×10^{-3}

Answer: C
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

24) 1.0 micrometer equals how many millimeters?
A) 1.0×10^{-6}

B) 1.0×10^{-3}

C) 1.0×10^{3}

D) 1.0×10^{6}

Answer: B
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

25) The number of significant figures in 3.24 cm is
A) 2
B) 3
C) 4
D) 5

Answer: B
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

26) The precision and number of significant figures in 1.003 km is
A) precision = 0.0001 km, significant figures = 4.
B) precision = 0.001 km, significant figures = 4.
C) precision = 0.0001 km, significant figures = 3.
D) precision = 0.001 km, significant figures = 3.
E) precision = 0.0001 km, significant figures = 2.

Answer: B
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

27) The precision and number of significant figures in 0.0045 mm is
A) precision = 0.0001 mm, significant figures = 4.
B) precision = 0.001 mm, significant figures = 4.
C) precision = 0.0001 mm, significant figures = 3.
D) precision = 0.001 mm, significant figures = 3.
E) precision = 0.0001 mm, significant figures = 2.

Answer: E
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

28) The length 4.221 cm is added to 0.01 cm. The appropriately rounded sum is
A) 4.22 cm.
B) 4.231 cm.
C) 4.23 cm.
D) 4.2 cm.
E) 4.21 cm.

Answer: C
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

29) The length 3.76 mm is multiplied by 0.05 mm. The appropriately rounded product is
A) 0.18 mm^2.
B) 0.2 mm^2.
C) 0.19 mm^2.
D) 0.1881 mm^2.
E) 0.29 mm^2.

Answer: B
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

30) The length 3.76 mm is multiplied by 0.0232 mm. The appropriately rounded product is
A) 0.082 mm^2.
B) 0.09 mm^2.
C) 0.087 mm^2.
D) 0.0872 mm^2.
E) 0.08723 mm^2.

Answer: D
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

31) The length 3.76 mm is divided by 6 mm. The appropriately rounded ratio is
A) 0.627.
B) 0.63.
C) 0.6.
D) 0.62666.
E) 0.6267.

Answer: C
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

32) The length 3.76 mm is divided by 0.0232 mm. The appropriately rounded ratio is
A) 160.
B) 162.
C) 162.1.
D) 162.07.
E) 162.069.

Answer: B
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

33) A cube is 1.0 inch in length on the side (1 in = 2.54 cm). The volume of the cube is
A) 1.64×10^1 cm^3.
B) 1.6387×10^1 cm^3.
C) 1.6×10^1 cm^3.
D) 1.639×10^1 cm^3.

Answer: C
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

34) The number of seconds in exactly 30 days is
A) 2.59×10^6.
B) 2.592×10^6.
C) 2.5920×10^6.
D) 2.592000×10^6.

Answer: D
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

35) The population of the United States (in 2019) is approximately 329,000,000. Write this number in scientific notation.
A) 3.3×10^7

B) 329×10^6

C) 3.29×10^7

D) 3.29×10^8

E) 32.9×10^7

Answer: D
Type: MC
Topic: Scientific Notation and Significant Figures
Accessibility: Keyboard Navigation
Chapter: 01

36) Using the following unit conversions: 1.00 fluid ounce = 29.573 ml, 1.00 L = 1000 cm^3, density of water = 1.00 g/cm^3, the number of fluid ounces in a kg of water is
A) 48.8 fluid ounces.
B) 40.1 fluid ounces.
C) 33.8 fluid ounces.
D) 25.7 fluid ounces.

Answer: C
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

37) If the radius of the Earth is 6400.0 km and the atmosphere is 10.0 km high, then the volume of air around the Earth is
A) 5.16×10^{18} m^3.
B) 3.605×10^{16} m^3.
C) 5.2×10^{18} m^3.
D) 5.1552×10^9 m^3.

Answer: A
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

38) Approximately how many square centimeters are in 1 square foot (1 in = 2.54 cm)?
A) 30.5 cm$_2$

B) 929 cm$_2$

C) 366 cm$_2$

D) 144 cm$_2$

E) 22.3 cm$_2$

Answer: B
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

39) One angstrom $= 10^{-10}$ m and one fermi $= 10^{-15}$ m. What is the relationship between these units?
A) 1 angstrom $= 10^5$ fermi
B) 1 angstrom $= 10^{-5}$ fermi
C) 1 angstrom $= 10^{-25}$ fermi
D) 1 angstrom $= 10^{25}$ fermi

Answer: A
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

40) Which of the SI prefixes is used to indicate 10^9?
A) kilo
B) mega
C) giga
D) tera
E) nano

Answer: C
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

41) Which of the following is not an SI base unit?
A) kelvin
B) kilogram
C) newton
D) second
E) meter

Answer: C
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01

42) To be dimensionally consistent, distance [L], velocity [L/T], and time [T] must be related as follows.
A) distance = time/velocity
B) distance = velocity/time
C) distance = time/velocity$_2$

D) distance = velocity $\times$ time$_2$

E) distance = velocity $\times$ time

Answer: E
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

43) To be dimensionally consistent, distance [L], velocity [L/T], and acceleration [L/T^2] must be related as follows.
A) distance = velocity^2/acceleration
B) distance = velocity/acceleration
C) distance = velocity^2 × acceleration
D) distance = velocity × acceleration$_2$

Answer: A
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

44) To be dimensionally consistent, velocity [L/T], frequency [1/T], and wavelength [L] must be related as follows.
A) velocity = frequency^2 × wavelength
B) velocity = frequency × wavelength
C) velocity = frequency/wavelength
D) velocity = frequency/wavelength$_2$

Answer: B
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01

45) To be dimensionally consistent, velocity [L/T], pressure [M/LT^2], and density [M/L^3] must be related as follows.
A) velocity = pressure/density
B) velocity$_2$ = pressure/density^2
C) velocity = pressure/density$_2$
D) velocity^2 = pressure/density

Answer: D
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01

46) To be dimensionally consistent, velocity [L/T], force [ML/T^2], mass [M], and length [L] must be related as follows.
A) velocity^2 = force × length/mass
B) velocity2 = force × length/mass^2
C) velocity = force × length^2/mass
D) velocity = force × length/mass

Answer: A
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

47) To be dimensionally consistent, pressure [M/LT^2], density [M/L^3], and velocity [L/T] must be related as follows.
A) pressure2 = density × velocity^2
B) pressure = density × velocity2
C) pressure = density × velocity
D) pressure = density^2 × velocity

Answer: B
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01

48) To be dimensionally consistent, force [ML/T^2], pressure [M/LT^2], and length [L] must be related as follows.
A) force = pressure2 × length^2
B) force = pressure^2 × length
C) force = pressure × length2
D) force = pressure × length

Answer: C
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01

49) To be dimensionally consistent, distance [L], acceleration [L/T^2], and time [T] must be related as follows.
A) distance = acceleration^2 × time^2
B) distance = acceleration × time
C) distance = acceleration × time^2
D) distance = acceleration^2 × time

Answer: C
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01

50) To be dimensionally consistent, velocity [L/T], acceleration [L/T^2] and time [T] must be related as follows.
A) velocity = acceleration × time
B) velocity = acceleration × time^2
C) velocity = acceleration^2 × time^2
D) velocity = acceleration^2 × time

Answer: A
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01

51) Assume everyone in the United States consumes one soft drink in an aluminum can every two days. If there are 330 million Americans, estimate how many tons of aluminum need to be recycled each year if each can weighs 1/16 pound and one ton = 2000 pounds.
A) 750,000 tons
B) 1.9 million tons
C) 1.0 million tons
D) 3 million tons
E) 1,600,000 tons

Answer: B
Type: MC
Topic: Approximation
Accessibility: Keyboard Navigation
Chapter: 01

52) Estimate how many textbooks of 1000 pages stacked on top of each other would make a stack of books 15 feet high.
A) 100
B) 10
C) 1000
D) 1
E) 500

Answer: A
Type: MC
Topic: Approximation
Accessibility: Keyboard Navigation
Chapter: 01

53) Estimate the number of dollar bills (15.5 cm wide), placed end to end, that it would take to circle the Earth (radius $= 6.40 \times 10^3$ km).
A) 9.5×10^8

B) 2.6×10^8

C) 3.7×10^7

D) 1.2×10^7

E) 8.5×10^6

Answer: B
Type: MC
Topic: Approximation
Accessibility: Keyboard Navigation
Chapter: 01

54) Find the equation $x = at + b$ that fits the following data.

t(sec)	0	2	4	6	8	10
x(m)	20	90	160	230	300	370

A) $x = 45\ t + 20$
B) $x = 35\ t + 20$
C) $x = 35\ t + 15$
D) $x = 25\ t + 45$

Answer: B
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

55) Find the equation $x = at^2 + b$ that fits the following data.

t(sec)	0	1	2	3	4	5
x(m)	-16	-12	0	20	48	84

A) $x = 4t^2 + 16$
B) $x = 2t^2 - 16$
C) $x = 4t^2 - 16$
D) $x = 2t^2 + 16$

Answer: C
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

56) Find the equation $x = at^2 + b$ that fits the following data.

t(sec)	1	3	5	7	9	11
x(m)	2	18	50	98	162	242

A) $x = t^2 + 18$
B) $x = 4t^2 - 2$
C) $x = t^2 + 1$
D) $x = 2t^2$

Answer: D
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

57) Find the equation $v^2 = ah + b$ that fits the following data.

h(m)	2	4	6	8	10	12
v(m/s)	2.83	4.00	4.90	5.66	6.32	6.93

A) $v^2 = 4h$
B) $v^2 = 2h + 8$
C) $v^2 = 4h + 4.90$
D) $v^2 = h$

Answer: A
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

58) Find the equation $x = at + b$ that fits the following data.

t(sec)	0	2	4	6	8	10
x(m)	80	40	0	-40	-80	-120

A) $x = 20t - 80$
B) $x = -20t + 80$
C) $x = 40t + 80$
D) $x = -40t + 20$

Answer: B
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01

59) Find the equation $x = at^2 + b$ that fits the following data.

t(sec)	0	1	2	3	4	5
x(m)	60	58	52	42	28	10

A) $x = -4t^2 + 60$
B) $x = 5t^2 + 60$
C) $x = -2t^2 + 60$
D) $x = 3t^2 + 60$

Answer: C
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01

60) Find the equation $x = at^2 + bt$ that fits the following data.

t(sec)	1	3	5	7	9	11
x(m)	3	21	55	105	171	253

A) $x = 2t$
B) $x = 6t^2 - 3t$
C) $x = 2t^2 + 2t$
D) $x = t^2 + 2t$

Answer: C
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01

61) Find the equation $v^2 = ah + b$ that fits the following data.

h(m)	2	4	6	8	10	12
v(m/s)	0	2.00	2.83	3.46	4.00	4.47

A) $v^2 = 3h - 6$
B) $v^2 = h - 2$
C) $v^2 = 2h + 4$
D) $v^2 = 2h - 4$

Answer: D
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01

62) Lake Superior has a shoreline of length 2726 miles. What would be its diameter in km if it were a perfectly circular lake? One mile is 1.609 km.
A) 1694 km
B) 1396 km
C) 539 km
D) 698 km
E) 270 km
F) 847 km

Answer: B
Type: MC
Topic: Units
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

63) Lake Superior has a shoreline of length 2726 miles. What would be its area in km^2 if it were a perfectly circular lake? One mile is 1.609 km.
A) 1.53×10^6 km^2
B) 9.51×10^5 km^2
C) 5.91×10^5 km^2
D) 4.87×10^5 km^2
E) 6.12×10^6 km^2
F) 4.81×10^6 km^2

Answer: A
Type: MC
Topic: Units

64) The surface area of Antarctica is 13.2 million square kilometers. If 1 acre is equivalent to 4047 m^2, what is the surface area of Antarctica in acres?
A) 3.26×10^3 acres
B) 3.26×10^6 acres
C) 3.26×10^9 acres
D) 8.05×10^3 acres
E) 8.05×10^6 acres
F) 8.05×10^9 acres

Answer: C
Type: MC
Topic: Units

65) A liter is equivalent to 33.8 fluid ounces. How many liters of gasoline are required to fill a 21 gallon gas tank, if 1 gallon is equivalent to 128 fluid ounces?
A) 710 liters
B) 210 liters
C) 80 liters
D) 6 liters

Answer: C
Type: MC
Topic: Units

66) A major league pitcher is recorded as having thrown a 105 mph fastball. What is the speed of the pitch in m/s? One mile is equivalent to 1609 m.
A) 15 m/s
B) 34 m/s
C) 47 m/s
D) 235 m/s

Answer: C
Type: MC
Topic: Units

67) Acceleration has dimension [L/T2]. Use dimensional analysis to determine the ratio of accelerations for car A to car B, if, everything else being equal, car A travels a given distance in half the time required by car B.
A) 2
B) 4
C) 1/2
D) 1/4
E) 1/√2
F) √2

Answer: B
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01

68) Consider the ratio of the surface area of a cube to its volume. What happens to this ratio if the side length of the cube decreases by a factor of 2?
A) Increases by a factor of 4
B) Decreases by a factor of 4
C) Increases by a factor of 2
D) Decreases by a factor of 2
E) Remains the same

Answer: C
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01
Gradable: automatic

69) Consider the ratio of the surface area of a sphere to its volume. What happens to this ratio if the diameter of the sphere increases by a factor of 3?
A) increases by a factor of 3
B) decreases by a factor of 3
C) increases by a factor of 9
D) decreases by a factor of 9
E) stays the same

Answer: B
Type: MC
Topic: The Use of Mathematics
Accessibility: Keyboard Navigation
Chapter: 01

70) You can reason that the time required for a ball to fall is related to the height from which it falls and to the acceleration due to gravity. Time is measured in seconds, height in meters, and gravitational acceleration in meters per second squared. Using dimensional analysis, determine how the time to fall from height h compares to the time required to fall from height 2h.
A) It takes 1/2 as long.
B) It takes 2 times as long.
C) It takes 4 times as long.
D) It takes 1/4 as long.
E) It takes $\sqrt{2}$ times as long.
F) It takes $\dfrac{1}{\sqrt{2}}$ as long.

Answer: F
Type: MC
Topic: Dimensional Analysis
Accessibility: Keyboard Navigation
Chapter: 01

71) What is the approximate volume of the average adult human body?
A) 0.1 m$_3$
B) 0.01 m$_3$
C) 0.5 m$_3$
D) 1 m$_3$

Answer: A
Type: MC
Topic: Approximation
Accessibility: Keyboard Navigation
Chapter: 01

72) What is the approximate volume of an adult human's head?
A) 0.001 m$_3$
B) 0.005 m$_3$
C) 0.02 m$_3$
D) 1.0 m$_3$
E) 0.1 m$_3$

Answer: B
Type: MC
Topic: Approximation
Accessibility: Keyboard Navigation
Chapter: 01

73) Estimate the surface area of an adult human's head.
A) 0.01 m^2
B) 0.5 m^2
C) 1.0 m^2
D) 0.1 m^2

Answer: D
Type: MC
Topic: Approximation
Accessibility: Keyboard Navigation
Chapter: 01

74) Which of the following is a reasonable estimate for the total surface area of all the seats in a football stadium that seats 100,000 spectators? Consider only the horizontal portion of the seats (the part that people actually sit on).
A) 1×10^3 m^2
B) 2×10^6 m^2
C) 5×10^2 m^2
D) 1×10^4 m^2
E) 2×10^5 m^2

Answer: D
Type: MC
Topic: Approximation
Accessibility: Keyboard Navigation
Chapter: 01

75) A graph of x vs. t is linear, and it intercepts the vertical axis at -15 m and the horizontal axis at 5 s. What is the value of x corresponding to $t = 3$ s?
A) 6 m
B) -6 m
C) 9 m
D) -9 m
E) 26 m
F) -26 m

Answer: B
Type: MC
Topic: Graphs
Accessibility: Keyboard Navigation
Chapter: 01

76) A graph of x vs. t^2 is linear, and intercepts the vertical axis at 12 m and the horizontal axis at 4 s^2. What is the function?
A) $x = 12 \text{ m} + (6 \text{ m/s}^2)t^2$
B) $x = 12 \text{ m} - (6 \text{ m/s}^2)t^2$
C) $x = 12 \text{ m} - (3 \text{ m/s}^2)t^2$
D) $x = 12 \text{ m} + (3 \text{ m/s}^2)t^2$

Answer: C
Type: MC
Topic: Graphs
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77) The best way to learn problem-solving techniques for physics is to
A) watch others demonstrate them.
B) practice them.
C) memorize them.
D) read about them in the text.

Answer: B
Type: MC
Topic: Problem-solving Techniques
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78) After carefully reading a physics problem, a good first step in solving it is to
A) draw a sketch or diagram.
B) work backwards from the solution.
C) look up other similar problems with solutions.
D) look up equations that have the same variables.

Answer: A
Type: MC
Topic: Problem-solving Techniques
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79) To find the slope from a graph of data for which a linear relation is expected, you should
A) use two nearby data points.
B) use two data points as far away as possible from each other.
C) use two nearby points on the best-fit line, which are not actual data points.
D) use two distant points on the best-fit line, which are not actual data points.
E) calculate the slope for every possible pair of data points, and average the values.

Answer: D
Type: MC
Topic: Graphs
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Chapter: 01
Subtopic: Graphing Data

80) A 2.0 kg object is moving at a speed of $v = 12.0$ m/s. The drag force is 6.0 N. If the drag force is given by the equation $F = bv^2$, then the value of b is
A) 1.5×10^{-2} Ns^2/m^2.
B) 4.2×10^{-2} kg/m.
C) 3.9×10^{-1} kg/m^2.
D) 4.2×10^{-1} N/m^2.
E) 7.5×10^{-3} Ns^2/m^2.

Answer: B
Type: MC
Topic: Units
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