AP physics C - Webreview (practice test) chapter 1

Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 1. In mechanics, physicists use three basic quantities to derive additional quantities. Mass is one of the three quantities. What are the other two?
   a. length and force
   b. power and force
   c. length and time
   d. force and time
   e. power and time

_____ 2. The prefixes which are abbreviated p, n, and G represent which of the following?
   a. 10^{-2}, 10^{-6}, and 10^{15}
   b. 10^{-9}, 10^{6}, and 10^{10}
   c. 10^{-12}, 10^{-9}, and 10^{9}
   d. 10^{-15}, 10^{-6}, and 10^{12}
   e. 10^{-10}, 10^{-9}, and 10^{6}

_____ 3. One year is about _____ seconds while one day is exactly _____ seconds.
   a. 3.16×10^{7}, 86 400
   b. 5.26×10^{5}, 86 400
   c. 3.16×10^{7}, 8 640
   d. 1.04×10^{6}, 36 000
   e. 1.58×10^{7}, 36 000

_____ 4. Which formula is dimensionally consistent with an expression yielding a value for velocity? (*a* is acceleration, *x* is distance, and *t* is time)
   a. v/t^{2}
   b. vx^{2}
   c. v^{2}/t
   d. at
   e. v/x^{2}

_____ 5. If the displacement of an object, *x*, is related to velocity, *v*, according to the relation $x = Av$, the constant, *A*, has the dimension of which of the following?
   a. acceleration
   b. length
   c. time
   d. area
   e. volume

_____ 6. The speed of a boat is often given in knots. If a speed of 5 knots were expressed in the SI system of units, the units would be:
   a. m.
   b. s.
   c. m/s.
   d. kg/s.
   e. m^{2}.

_____ 7. Suppose an equation relating position, x, to time, t, is given by $x = b\,t^3 + c\,t^4$, where b and c are constants. The dimensions of b and c are respectively:
a. T^3, T^4.
b. $1/T^3, 1/T^4$.
c. $L/T^3, L/T^4$.
d. $L^2 \cdot T^3, L^2 \cdot T^4$.
e. $L \cdot T^3, L \cdot T^4$.

_____ 8. Which one of the choices below represents the preferred practice regarding significant figures when adding the following: $12.4 + 11 + 67.37 + 4.201$?
a. 94.971
b. 94.97
c. 95.0
d. 95
e. 100

_____ 9. The length and width of a standard sheet of paper is measured, and then the area is found by calculation to be 93.50 in^2. The number of significant figures in the width measurement must be at least:
a. 1.
b. 2.
c. 3.
d. 4.
e. none of the above

_____ 10. The number 0.00017 has how many significant figures?
a. 2
b. 3
c. 5
d. 6
e. 4

_____ 11. A cereal box has the dimensions of 0.19 m × 0.28 m × 0.070 m. If there are 3.28 feet per meter, then what is the volume of the box in cubic feet?
a. 0.13 cubic feet
b. 0.040 cubic feet
c. 0.012 cubic feet
d. 0.003 7 cubic feet
e. 0.11 cubic feet

_____ 12. The distance to the Andromeda Galaxy is estimated at about 2×10^6 light years. A light year is the distance traveled by light in one year; if the speed of light is 3×10^8 m/s, about how far is it from our galaxy to Andromeda? (1 year $= 3.15 \times 10^7$ s)
a. 10×10^{15} m
b. 1×10^{18} m
c. 2×10^{22} m
d. 6×10^{12} m
e. 8×10^{20} m

_____ 13. Water flows into a swimming pool at the rate of 8.0 gal/min. The pool is 16 ft wide, 32 ft long and 8.0 ft deep. How long does it take to fill? (1 U.S. gallon = 231 cubic inches)
   a.   32 hours
   b.   64 hours
   c.   48 hours
   d.   24 hours
   e.   16 hours

_____ 14. The mass of the sun is 2.0×10^{30} kg, and the mass of a hydrogen atom is 1.67×10^{-27} kg. If we assume that the sun is mostly composed of hydrogen, how many atoms are there in the sun?
   a. 1.2×10^{56} atoms
   b. 3.4×10^{56} atoms
   c. 1.2×10^{57} atoms
   d. 2.4×10^{57} atoms
   e. 3.2×10^{57} atoms

_____ 15. A physics class in a large lecture hall has 150 students. The total mass of the students is about _____ kg.
   a. 10^2
   b. 10^3
   c. 10^4
   d. 10^5
   e. 10^6

_____ 16. An apartment has 1100 ft² of floor space. What is the approximate volume of the apartment?
   a. 10^3 ft³
   b. 10^4 ft³
   c. 10^5 ft³
   d. 10^6 ft³
   e. 10^7 ft³

_____ 17. Which point is nearest the x axis?
   a. $(-3,4)$
   b. $(4,5)$
   c. $(-5,3)$
   d. $(5,-2)$
   e. $(-4,4)$

_____ 18. A right triangle has sides 5.0 m, 12 m, and 13 m. The smallest angle of this triangle is nearest:
   a.   21°.
   b.   23°.
   c.   43°.
   d.   55°.
   e.   Not attainable since this is not a right triangle.

_____ 19. A train slowly climbs a 500-m mountain track which is at an angle of 10.0° with respect to the horizontal. How much altitude does it gain?
   a.   86.8 m
   b.   88.2 m
   c.   341 m
   d.   492 m
   e.   99.8 m

_____ 20. Note the expression: $y = A/x^3$. Which statement is most consistent with this expression?
   a. y is less than A
   b. if x is halved, y is multiplied by eight
   c. if x is doubled, y is multiplied by a factor of 8
   d. y is greater than x
   e. y is greater the A

_____ 21. A circle has an area of 2.0 m². A second circle has double the radius of the first. The area of the second circle is ____ times that of the first.
   a. 0.50
   b. 2.0
   c. 4.0
   d. 8.0
   e. 16

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Answer Section

MULTIPLE CHOICE

1. C
2. C
3. A
4. D
5. C
6. C
7. C
8. D
9. D
10. A
11. A
12. C
13. B
14. C
15. C
16. B
17. D
18. B
19. A
20. B
21. C