AP PHYSICS

Name: _____

Period: _____ Date: _____

Points: 53 Score: _____ IB Curve: _____

DEVIL PHYSICS

BADDEST CLASS ON CAMPUS

AP EXAM		CHAPTER TEST	
50 Multiple Choice • 45 Single Response • 5 Multi-Response	90 min, 1 point each	25 Multiple Choice • 22 Single Response • 3 Multi-Response	45 min
Free Response • 3 Short Free Response • 2 Long Free Response	90 min • 13 min ea, 7 pts ea • 25 min ea, 12 pts ea	Free Response • 2 Short Free Response • 1 Long Free Response	45 min • 12 min ea, 7 pts ea • 20 min ea, 12 pts ea

CHAPTER 1 TEST REVIEW -- MARKSCHEME

MULTIPLE CHOICE

1. (__/1) Four students measure the mass of an object, each using a different scale. They record their results as follows:

Student	A	B	C	D
Mass (g)	27.2	27.21	30	27

Which student used the least precise scale?

a. A
b. B
c. C
d. D
e. E

2. (__/1) All of the following are base units of the SI system EXCEPT:
   a. Kilogram
   b. Kelvin
   c. Meter
   d. Volt
   e. Candela
3. (__/1) How many basic units does the SI system have?
   a. Three
   b. Four
   c. Five
   d. Seven
   e. Ten

4. (__/1) The metric prefix for one thousand is
   a. Milli
   b. Centi
   c. Mega
   d. Kilo
   e. Micro
5. (__/1) Express the number 0.02 days using a metric prefix.
   a. 2 decidays
   b. 2 centidays
   c. 2 hectodays
   d. 2 millidays
   e. 2 microdays
6. (__/1) What is the conversion factor between km/hr^2 and m/s^2?
   a. $7.72 \times 10^{-6}\ m/s^2$
   b. $2.78 \times 10^{-1}\ m/s^2$
   c. $1.30 \times 10^{4}\ m/s^2$
   d. $3.60\ m/s^2$
   e. $1.30 \times 10^{-4}\ m/s^2$
7. (__/1) The position *x*, of an object is given by the equation $x = A + Bt + Ct^2$ where *t* refers to time. What are the dimensions of A, B, and C?
   a. Distance, distance, distance
   b. Distance, time, $time^2$
   c. Distance, distance/time, $distance/time^2$
   d. distance/time, $distance/time^2$, $distance/time^3$
8. (__/1) What is the percent uncertainty in the measurement 7.63 ± 0.13cm
   a. 0.017%
   b. 1.7%
   c. 0.99%
   d. 99%
   e. 59%
9. (__/1) What is the volume, and its approximate uncertainty, of a sphere of radius 5.46 ± 0.03m?
   a. 375 ± 0.09 m
   b. 384 ± 0.27 m
   c. 70.2 ± 0.55 m
   d. 125 ± 1.6 m
   e. 682 ± 10 m^3
10. (__/1) The number of significant figures in 0.040 is
    a. One
    b. Two
    c. Three
    d. Four

11. (__/1) Use the rules for significant figures to find the difference between 117.3 and 108.57.
    a. 9
    b. 8.7
    c. 8.73
    d. 8.730
    e. 8.7300
12. (__/1) Use the rules for significant figures to find the area of a rectangle that is 3.25m long and 1.5m wide.
    a. 4.875 m^2
    b. 4.87 m^2
    c. 4.80 m^2
    d. 4.9 m^2
    e. 5 m^2
13. (__/1) Use the rules for significant figures to find the diagonal of a garden measuring 15 m by 13.7 m.
    a. 5.4 m
    b. 19 m
    c. 20 m
    d. 29 m
14. (__/1) Write the number 4567.89 in proper scientific notation.
    a. 456789 x 10^{-2}
    b. 4.56789 x 10^{-3}
    c. 4.56789 x 10^{3}
    d. 4568
    e. 4567.89 x 10^{0}
15. (__/1) 0.00001942 can also be expressed as,
    a. 1.942 x 10^{-5}
    b. 19.42 x 10^{4}
    c. 1.942 x 10^{-4}
    d. 1942 x 10^{8}
    e. 1.9 x 10^{-5}
16. (__/1) A measurement of 0.00045 meters can be expressed by what number of centimeters? *Use the rules for proper scientific notation and significant figures.*
    a. 4.5 x 10^{-2} cm
    b. 4.50 x 10^{-2} cm
    c. 4.50 x 10^{-4} cm
    d. 4.50 x 10^{4} cm
    e. 0.0450 cm

17. (__/1) How would you write the number 6.937 x 10^{-7} in decimal form?
    a. 0.0006937
    b. 0.00006937

c. 0.000006937
d. 0.0000006937
e. 0.00000006937

18. (__/1) A hot air balloon rises to an altitude of 600 fathoms. What is this height in feet? (1 fathom = 6 feet)
    a. 100 ft
    b. 600 ft
    c. 1200 ft
    d. 3600 ft
    e. Cannot be determined from the information given

19. (__/1) Given the mass of an electron, how many electrons would it take to make 2.5 kg of electrons
    a. 2.7×10^{30}
    b. 2.7×10^{-30}
    c. 2.3×10^{-30}
    d. 3.6×10^{-30}
    e. 3.6×10^{30}
20. (__/1) How many m/s is 50 mi/h equivalent to? (1 mi = 1609 m).
    a. 0.045 m/s
    b. 2.2 m/s
    c. 22 m/s
    d. 45 m/s
    e. 49 m/s
21. (__/1) A football field is 120 yd long (counting the endzones) and 50 yd wide. What is the area of the football field in m^2? (1 yd = 91.44 cm).
    a. $7.2 \times 10^{-1}\ m^2$
    b. 4.2×10^{3}
    c. 5.0×10^{3}
    d. 4.2×10^{7}
    e. 5.0×10^{7}

22. (__/1) A thick-walled metal pipe of length 20.0 cm has an inside diameter of 2.00 cm and an outside diameter 2.40 cm. What is the total surface area (inside and out) in m^2 if we neglect the ends?
    a. 276 m^2
    b. 553 m^2
    c. 138 m^2
    d. 0.0276 m^2
    e. 0.0552 m^2
23. (__/1) Concrete is sold by the cubic yard. 5.00 cubic yards of concrete would equal how many cubic meters? (1m = 1.094 yds)
    a. 0.239 m^3
    b. 0.262 m^3
    c. 3.82 m^3
    d. 4.18 m^3
    e. 4.57 m^3
24. (__/1) An average human heart has a heart rate of 70 beats per minute. Using that average how many times has a teenager's heart beaten over 17 years?
    a. 8.9 x 10^6
    b. 1.0 x 10^7
    c. 3.7 x 10^7
    d. 6.3 x 10^8
    e. 3.7 x 10^{10}

FREE RESPONSE

25. The radius of the earth is 3963 mi. (1mi = 1609m)
    a. (__/2) If you jogged at a 10 min/mi pace, how many days would it take to jog around the world?

$$C = 2\pi r$$

$$C = 2x\pi x3963 = 24,900mi$$

$$\frac{24,900mi}{1} x \frac{10min}{1mi} x \frac{1hr}{60min} x \frac{1day}{24hr} = 173days$$

    b. (__/2) What is the surface area of the earth in m^2?

$$r = \frac{3963mi}{1} x \frac{1609m}{1mi} = 6.38x10^6m$$

$$SA = 4\pi r^2 = (4)(\pi)(6.38x10^6m)^2 = 5.11x10^{14}m^2$$

    c. (__/3) If the density of the earth is approximately 5.513 g/cm^3, what is the weight of the earth in pounds? (1kg ≈ 2.2 lbs)

$$V = \frac{4}{3}\pi r^3$$

$r_{Earth} = \frac{3963mi}{1} x \frac{1609m}{1mi} x \frac{100cm}{m} = 6.38x10^8 cm$

$V_{earth} = \frac{4}{3}\pi(6.38x10^8 cm)^3 = 1.09x10^{27} cm^3$

$\frac{1.09x10^{27} cm^3}{1} x \frac{5.513g}{1cm^3} x \frac{1kg}{1000g} x \frac{2.2lb}{1kg} = 1.32x10^{25} lbs$

26. The mass of Mars ($1.41x10^{23}$ lbs) is about one-tenth that of the Earth, and its radius is about half that of the Earth's. (1kg ≈ 2.2 lbs)

a. (__/5) What is the mean density $\left(\rho = \frac{mass}{volume}\right)$ of Mars in kg/m^3?

$mass_{mars} = \frac{1.41x10^{23} lbs}{1} x \frac{1kg}{2.2lbs} = 6.4x10^{22} kg$

$\rho_{mars} = \frac{mass}{volume} = \frac{6.4x10^{22} kg}{1.36x10^{20} m^3}$

$r_{Earth} = \frac{3963mi}{1} x \frac{1609m}{1mi} = 6.38x10^6 m$

$\rho_{mars} = 471\, kg/m^3$

$r_{mars} = \left(\frac{1}{2}\right) r_{earth} = \left(\frac{6.38x10^6 m}{2}\right) = 3.19x10^6 m$

$V_{mars} = \frac{4}{3}\pi(3.19x10^6 m)^3 = 1.36x10^{20} m^3$

b. (__/5) How does the mean density of Mars compare to the mean density of the Earth?

$\rho_{mars} = 471\, kg/m^3$

$r_{Earth} = \frac{3963mi}{1} x \frac{1609m}{1mi} = 6.38x10^6 m$

$m_{earth} = (10) m_{mars}$

$V_{earth} = \frac{4}{3}\pi(6.38x10^6 m)^3 = 1.09x10^{21} m^3$

$m_{earth} = (10)\left(\frac{1.41x10^{23} lbs}{1} x \frac{1kg}{2.2lbs}\right)$

$\rho_{earth} = \frac{mass}{volume} = \frac{6.4x10^{23} kg}{1.09x10^{21} m^3} = 589\, kg/m^3$

$m_{earth} = 6.4x10^{23} kg$

$\frac{\rho_{mars}}{\rho_{earth}} = \frac{471 kg/m^3}{589 kg/m^3} = 0.80$

$\rho_{mars} = 0.80 \rho_{earth}$

27. (__/4) Explain how random and systematic error affected your Ball Bounce lab.

28. (__/4) Determine and justify a propagated uncertainty for your 'bounce constant'.

29. (__/4) What is Physics?

31. .

a. (__/X)