Chem25, Winter 2012, Foothill College, Test1 Name_____

Please read all the questions VERY carefully before answering. Use a pen to answer the short question and a pencil to fill out the circles in the scantron. Write neatly. If I cannot read your answer, you will not receive any point. Use the attached periodic table and constant chart. No outside paper is allowed. Total points = 52+ (30x3=)90=142

SHORT ANSWER. In all calculations, write the set up equation first, then put the raw data with units. Then do your calculations.

1) Show calculations with units to convert 6.32 cm into inches (1 in = 2.54 cm.). (4 pts.) 1) _____

2) Calculate (with units) how many in^3 are in 2.20 cm^3 (1 in = 2.54 cm.)? (8 pts.) 2) _____

3) A room has dimensions of 10.0 ft × 20.0 ft × 8.00 ft. Given that there are three feet in a yard, calculate the volume of the room in yd^3? (8 pts.) 3) _____

4) Calculate the volume of 12.8 g of a liquid that has a density of 0.789 g/mL. (8 pts.) 4) _____

5) Show your calculation to find how many kilojoules are there in 95.0 Calories? (given 1 cal = 4.18 joules) (6 pts.) 5) _____

6) When methane is burned with oxygen, the products are carbon dioxide and water. If you produce 18 grams of water from 8 grams of methane and 32 grams of oxygen, calculate how many grams of carbon dioxide were produced in the reaction? (6 pts.) 6) _____

7) Suppose it took 108 joules of energy to raise a bar of gold from 25.0°C to 29.7°C. Given that the specific heat capacity of gold is 0.128 J/g·°C, what is the mass (in grams) of the bar of gold? Show all your calculations with set up equation and units. (8 pts.) 7) _____

8) During density measurement of sulphur, if the sulphur piece was large and the top of the sulphur was above the water level, would your measured density of sulphur would be 8) _____

(a) HIGH or LOW or it would be CORRECT (circle the correct one) (2 pts)

(b) Explain/show your logic (2 pts.).

MULTIPLE CHOICE. Use scantron to answer the questions. Choose the one alternative that best completes the statement or answers the question (3 pts. each).

9) Who discovered the atomic theory? 9) _____

A) Nivaldo Tro
B) John Dalton and Antoine Lavoisier
C) John Dalton
D) Antoine Lavoisier
E) none of the above

10) The correct scientific notation for the number 500.0 is: 10) _____

A) 5.000×10^2
B) 5.00×10^2
C) 5×10^{-2}
D) 5×10^2
E) none of the above

11) The correct decimal representation of 1.201×10^{-7} is: 11) _____

A) 12010000
B) 0.0000001201
C) 0.0001201
D) 1201.000
E) none of the above

12) In the number 48.93, which digit is estimated? 12) _____

A) 8
B) 9
C) 4
D) 3
E) None of the above, all digits are certain.

13) There are exactly 2.54 centimeters in 1 inch. When using this conversion factor, how many significant figures are you limited to? 13) _____

A) 1
B) 3
C) ambiguous
D) depends on if you are using it in multiplication/division or addition/subtraction
E) infinite number of significant figures

14) The correct number of significant figures in the number 865,000 is: 14) _____

A) 6
B) 4
C) 3
D) ambiguous
E) none of the above

15) The correct number of significant figures in the number 0.002320 is: 15) _____

A) 7
B) 3
C) 4
D) ambiguous
E) none of the above

16) Determine the answer for the equation below with correct number of significant figures: 16) _____

$3.215 \times 13.2 \div 0.218 =$ _____

A) 194.7
B) 195
C) 194.67
D) 194.669
E) none of the above

17) Determine the answer to the following equation with correct number of significant figures: 17) _____
13.96 - 4.9102 + 71.5 = _____

A) 80.5498
B) 81
C) 80.55
D) 80.5
E) none of the above

18) Determine the answer to the following equation with correct number of significant figures: 18) _____
(17.103 + 2.03) x 1.02521 = _____

A) 19.6
B) 20
C) 19.62
D) 19.6153
E) none of the above

19) The correct prefix for the multiplier 1,000,000,000 is: 19) _____

A) milli.
B) giga.
C) mega.
D) tera.
E) none of the above

20) What is the standard SI unit for mass? 20) _____

A) ton
B) pound
C) gram
D) kilogram
E) none of the above

21) The standard SI unit for temperature is: 21) _____

A) atmospheres.
B) Fahrenheit.
C) Kelvin.
D) Celsius.
E) none of the above.

22) How many milliliters are in 17.5 L? 22) _____

A) 1.75×10^{-2}
B) 1.75×10^{3}
C) 1.75×10^{4}
D) 175
E) none of the above

23) How many cm^3 are there in 1.25 ft^3? 23) _____

A) 38.1
B) 3.54×10^4
C) 5.49×10^3
D) 246
E) none of the above

24) What is the density (g/mL) of an object that has a mass of 14.01 grams and, when placed into a graduated cylinder, causes the water level to rise from 25.2 mL to 33.6 mL? 24) _____

A) 1.7
B) 0.60
C) 2.4
D) 1.8
E) none of the above

25) A plastic block has dimensions of 2.2 cm x 3.0 cm x 1.5 cm and a mass of 12.4 grams. Will the block float in water and why? 25) _____

A) Yes, because the density of the block is 0.80 g/mL which is less than the density of water.
B) No, because the density of the block is 1.3 g/mL which is greater than the density of water.
C) No, because the density of the block is 0.80 g/mL which is greater than the density of water.
D) Yes, because the density of the block is 1.3 g/mL which is less than the density of water.
E) none of the above

26) The distance from New York City to Washington, DC is approximately 235 miles. Identify the correct solution map to convert from miles to kilometers using the prefix multipliers and the given conversion factors: 1 mile = 5280 ft; 1 ft = 12 in; 1 in = 2.54 cm. 26) _____

A) $235 \text{ mile} \times \frac{5280 \text{ ft}}{1 \text{ mile}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{10^{-2} \text{ m}}{1 \text{ cm}} \times \frac{1 \text{ km}}{10^3 \text{ m}}$

B) $235 \text{ mile} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{10^{-2} \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ km}}{10^3 \text{ m}}$

C) $235 \text{ mile} \times \frac{5280 \text{ ft}}{1 \text{ mile}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{2.54 \text{ in}}{1 \text{ ft}} \times \frac{1 \text{ m}}{10^{-2} \text{ cm}} \times \frac{10^3 \text{ km}}{1 \text{ m}}$

D) $235 \text{ mile} \times \frac{1 \text{ ft}}{5280 \text{ mile}} \times \frac{12 \text{ in}}{1 \text{ ft}} \times \frac{1 \text{ in}}{2.54 \text{ cm}} \times \frac{10^{-2} \text{ cm}}{1 \text{ m}} \times \frac{1 \text{ km}}{10^3 \text{ m}}$

E) $235 \text{ mile} \times \frac{1\,2 \text{ in}}{1 \text{ ft}} \times \frac{2.54 \text{ cm}}{1 \text{ in}} \times \frac{1 \text{ m}}{10^{-2} \text{ cm}} \times \frac{10^3 \text{ km}}{1 \text{ m}}$

27) Which state of matter has indefinite shape and is compressible? 27) _____

A) plasma
B) liquid
C) solid
D) gas
E) none of the above

28) Which among the following statements is false? 28) _____

A) A liquid has a definite volume; but it has no definite shape.
B) Both solids and liquids are incompressible while gases are compressible.
C) A gas has neither definite volume nor definite shape.
D) A solid has a definite shape and a definite volume.
E) none of the above

29) Which of the following items is a pure substance? 29) _____

A) seawater
B) brass
C) air
D) ice
E) none of the above

30) Which of the following is a heterogenous mixture? 30) _____

A) sugar water
B) air
C) milk
D) raisin bran
E) none of the above

31) Which of the following statements is FALSE? 31) _____

A) Mixtures may be composed of two or more elements, two or more compounds, or a combination of both.
B) A pure substance may either be an element or a compound.
C) A mixture may be either homogeneous or heterogeneous.
D) Matter may be a pure substance or it may be a mixture.
E) All of the above statements are true.

32) Which type of energy is associated with motion? 32) _____

A) kinetic
B) chemical
C) electrical
D) potential
E) none of the above

33) The boiling point of water is 33) _____

(1) 212°F (2) 0°C (3) 373 K

A) 2 and 3 only
B) 1 and 3 only
C) 1 and 2 only
D) all of 1, 2, and 3
E) none of 1, 2, and 3

34) What is the specific heat (J/g°C) of a metal object whose temperature increases by 3.0°C when 17.5 g of metal was heated with 38.5 J? 34) _____

A) 0.15
B) 4.18
C) 0.73
D) 1.4
E) none of the above

TRUE/FALSE. In scantron fill the circle "A" for a True answer and "B" for False answer (3 pts. each).

35) The mass of an object, 4.55×10^{-3} g, expressed in decimal notation is 0.000455 g. 35) _____

36) Exact numbers have an unlimited number of significant figures. 36) _____

37) When the number 65.59 is rounded to contain 2 significant figures, it becomes 66.0. 37) _____

38) Liquids have definite volume and indefinite shape. 38) _____