Student Name _____

1. Which of the following is an element?
A) water
B) oxygen
C) sugar
D) carbon dioxide

2. Which of the following is a compound?
A) iron
B) ammonia
C) cobalt
D) gold

3. Which of the following is a chemical change?
A) helium gas leaking from a balloon
B) frozen orange juice is reconstituted by the addition of water
C) a flashlight beam slowly dims and goes out
D) a spoonful of salt is dissolved in a bowl of soup

4. Which of the following is not an SI base unit?
A) kilometer
B) kilogram
C) second
D) Kelvin

5. Which of the following prefixes means 1/1000?
A) kilo
B) deci
C) centi
D) milli

6. What is 0.000000027 expressed in scientific notation?
A) 2.7×10^{8}
B) 2.7×10^{-7}
C) 27×10^{-9}
D) 2.7×10^{-8}

7. What is 356 expressed in scientific notation?
A) 35.6×10^{1}
B) 3.56×10^{2}
C) 3.56×10^{3}
D) 3.56×10^{-2}

8. Why does knowledge of atomic number enable us deduce the number of electrons present in an atom?
A) The number of electrons present in an atom is equal to twice the atomic number.
B) The number of electrons present in an atom is equal to the atomic weight minus the atomic number.
C) The number of electrons present in a neutral atom is equal to the atomic number.
D) The number of electrons present in an atom is equal to the number of neutrons present.

9. What is 7.78×10^{-8} expressed in a decimal?
A) 778000000
B) 0.000000778
C) 0.0000000778
D) 0.00000000778

10. For which of the following calculations is 9.9×10^{10} the correct answer?
A) $145.75 + (2.3 \times 10^{-1})$
B) $79{,}500 / (2.5 \times 10^{2})$
C) $(7.0 \times 10^{-3}) - (8.0 \times 10^{-4})$
D) $(1.0 \times 10^{4}) \times (9.9 \times 10^{6})$

11. What is the formula for the ionic compound formed by calcium and selenium?
A) CaSe
B) Ca_2Se
C) $Ca\ Se_2$
D) Ca_3Se

12. Which of the following measurements has five significant figures?
A) 4867 mi
B) 65 mL
C) 60,104 ton
D) 0.00003 cm

13. How many significant figures are there in 0.006 L?
A) 1
B) 2
C) 3
D) 4

14. The element oxygen consists of three naturally occurring isotopes: ^{16}O, ^{17}O, and ^{18}O. The atomic mass of oxygen is 16.0 amu. What can be implied about the relative abundances of these isotopes?
A) More than 50% of all O atoms are ^{17}O.
B) Almost all O atoms are ^{18}O.
C) The isotopes all have the same abundance, i.e. 33.3%.
D) The abundances of ^{17}O and ^{18}O are very small.

15. How many protons are there in the nucleus of vanadium-50?
A) 48
B) 40
C) 72
D) 23

16. The mass number = _____.
A) atomic number
B) number of protons
C) number of protons + number of neutrons
D) number of protons + number of electrons

17. How many neutrons are in the nucleus of a californium -250?
A) 250
B) 152
C) 98
D) 249

18. Name the V_2O_5?
A) divanadium pentaoxide
B) vanadium oxide
C) vanadium (V) oxide
D) vanadium (II) oxide

19. 157K equals _____ $T_K = T_C + 273$
A) 116C
B) -116C
C) 430C
D) -430C

20. Which of the following masses has the highest precision?
A) 90.00075
B) 840.00
C) 68.088
D) 0.704

21. Metter is defined as anything that occupies space and has _____.
A) odor
B) color
C) a definite shape
D) mass

22. Given the following, which is not the formula for an element?
A) calcium
B) nickel
C) air
D) gold

23. Which temperature represents absolute zero?
A) 0K
B) 0 ^oC
C) 273K
D) 273 ^oC

24. The most abundant isotope of uranium is ^{238}U, while all naturally occurring fluorine is ^{19}F. A molecule of UF_6 formed these isotopes contains
A) 146 neutrons
B) 152 neutrons
C) 200 neutrons
D) 206 neutrons

25. The elements in a column of the periodic table are known as
A) nonmetals
B) metals
C) a group
D) a period
E) metalloids

26. Convert 856mL to quarts (1L = 1.06qt)
A) 8.08×10^{5}qt
B) 1.24qt
C) 0.907qt
D) 9.07×10^{5}qt

27. A container can hold 22.0 gallons. How many liters is this? (1L = 1.06qt)
A) 5.83L
B) 83.L
C) 93.28L
D) 183L

28. Which of the following are compounds but not molecules? a) SO_2, b) S_8, c) Cs, d) N_2O_5, e) O, f) O_2, g) O_3, h) CH_4, i) KBr, j) S, k) P_4, l) LiF
A) f and h
B) a and d
C) i and l
D) d

29. A can beverage contains 16.0 fluid ounces of liquid. How many nanoliters is this? ((1fl oz = 29.6 mL)
A) 4.74×10^{-8}nL
B) 0.474 nL
C) 4.74×10^{-4}nL
D) 355.2 nL

30. Table salt has a density of 2.2 g/cm^3. The volume occupied by 67.89g of NaCl is
A) 149.4 cm^3
B) 0.032 cm^3
C) 300.9 cm^3
D) 30.9 cm^3

31. Which is the correct formula of cupper (II) oxide?
A) CuO
B) CuO_2
C) Cu_2O
D) Cu_2O_2

32. The chemical name for ClO_2^- is "chlorite ion". Therefore, the name of $HClO_2$
A) perchloric acid
B) chloric acid
C) chlorous acid
D) hypochlorous acid

33. The correct name for $(NH_4)_3PO_4$ is
A) ammonium phosphate
B) ammonium phosphite
C) triammonium phosphate
D) hydrogen nitrogen phosphide

34. What is the correct formula for strontium sulfide?
A) ScS
B) SrS_2
C) ScS_2
D) SrS

35. What is the correct formula for calcium permanganate?
A) $CaCrO_4$
B) $Ca(MnO_4)_2$
C) $Ca(MgO_4)_2$
D) $CaMnO_4$

36. What is the correct name for $Mg(OH)_2$?
A) Magnesium hydrogen oxide
B) Magnesium hydroxide
C) Magnesium hydrate
D) Manganese hydroxide

37. An atom of the isotope phosphorous-31 consists of how many protons (p), neutrons (n), and electrons (e)?
A) 15p, 15n, 15e
B) 15p, 15n, 16e
C) 15p, 16n, 15e
D) 16p, 16n, 15e

38. Given the 17 electrons, 17 protons, and 20 neutrons in one of which atoms?
A) chlorine-37
B) rubidium-85
C) calcium-20
D) chlorine-35

39. Evaporation refers to which conversion?
A) solid to gas
B) liquid to gas
C) solid to liquid
D) gas to liquid

40. Two isotopes of an element differ only in their
A) symbol
B) atomic number
C) number of protons
D) atomic mass

Use the following to answer questions 41 – 44:

Atom or ion of element	A	B	C	D	E	F	G
Number of electrons	5	10	18	28	36	5	9
Number of protons	5	7	19	30	35	5	9
Number of neutrons	5	7	20	36	46	6	10

41. Which of the species are neutral?
A) C
B) A and B
C) A, F and G
D) E

42. Which of the species are negatively charged?
A) C and D
B) D, E, and G
C) A and D
D) B and E

43. Which of the species are positively charged?
A) C and D
B) B and E
C) A, C and F
D) G

44. What are the conventional symbols for species C and F?
A) $^{39}_{20}Ca^{+}$, $^{11}_{6}C$
B) $^{39}_{19}K^{+}$, $^{11}_{5}B$
C) $^{39}_{20}Ca^{+}$, $^{11}_{5}B$
D) $^{39}_{19}K^{+}$, $^{11}_{6}C$

45. Which of these pairs of elements would be most likely to form an ionic compound?
A) P and Br
B) O and Zn
C) Cu and K
D) Al and Rb

46. The atomic mass (atomic weight) for an element is based on?
A) nitrogen
B) carbon
C) carbon - 12
D) hydrogen

47. Elements whose names end with ium are usually metals; sodium is one example. Identify a nonmental whose name also ends with ium.
A) potassium
B) magnesium
C) helium
D) barium

48. Which one of these is an example of a physical property?
A) Dynamite explodes
B) Meat rots if it is not refrigerated
C) Honey tastes sweet
D) Ice floats on top of liquid water

49. Do the indicated arithmetic and give the answer to the correct number of significant figures.
$(6.3 \times 10^{-5} \times 96.5) + 3.04 =$
A) 3.0
B) 3.04
C) 3.0461
D) 3.04608

50. Choose the response that includes all the items listed below that are pure substances:
i. orange juice ii. steam iii. wine iv. oxygen v. soup
A) i, iii, v
B) i, iii, iv
C) ii, iv
D) iv