50.) The fundamental SI unit of times is the \_\_\_\_\_.

Option A: Hour Option B: Minute Option C: Seconds Option D: Days Answer: C

49.) Which is a measure of The sum of the Kinetic and potential energies of each particles in a system?

Option A: E, the internal energy Option B: G, the Gibbs free energy Option C: H, the enthalpy Option D: T, the Temperature Answer: A

48.) Under thermodynamics standard state conditions, the element Oxygen Occurs as?

Option A: O(g) Option B: O2(g) Option C: O2(l) Option D: O3(g) Answer: B

47.) Smog is an example of

Option A: A compound Option B: An Element Option C: A Mixture Option D: An ion Answer: C

46.) Which group of element is passive?

Option A: Halogens Option B: Noble Gases Option C: Alkali Metals Option D: Alkaline Earth Metals Answer: B

45.) Which of the following can be interpreted as a measure of randomness?

Option A: Enthalpy

Option B: Entropy Option C: Free Energy Option D: Temperature Answer: B

44.) What is the identity of The element with 7 protons, 7 neutrons and 7 electrons?

Option A: C Option B: N Option C: Al Option D: Mg Answer: B

43.) Most of the Alpha Particles directed at thin Gold Foil in Rutherford's experiment

Option A: Bounced directly back from the foil Option B: Passed directly through the foil undeflected Option C: Passed through the foil but was deflected at an angle Option D: Were absorbed by the foil Answer: B

42.) Which of the following is correct?

Option A: G = HA - TSOption B: G = H - TSOption C: G = Ea - TSOption D: G = TEa - HAnswer: B

41.) Elements in a periodic table have similar

Option A: Chemical Properties Option B: Densities Option C: Masses Option D: Physical Properties Answer: A

40.) \_\_\_\_\_ is the change in enthalpy when 1 mole of a substance is converted from liquid to gaseous state at its Boiling point.

Option A: Enthalpility Conversion Option B: Enthalpy of Vaporization Option C: Molarity Conversion Option D: Enthalpy of Sublimation

## Answer: B

39.) \_\_\_\_\_\_ is the quantity of heat evolved or absorbed when one mole of the compound is formed from its elements.

Option A: Enthalpy of Combustion Option B: Enthalpy of solution Option C: Enthalpy of Formation Option D: Enthalpy of Dilution Answer: C

38.) What is the mole fraction of ethanol in a solution made by dissolving 25.0g of ethanol, in 53.6g of water?

Option A: 0.154 Option B: 0.846 Option C: 0.214 Option D: 0.272 Answer: A

37.) In \_\_\_\_\_, a French Physicst named \_\_\_\_\_ discovered that uranium-containing crystals emitted rays that could expose and fog photographic plates

Option A: 1986, Henry becquerel Option B: 1896, Henry Becquerel Option C: 1986, Henri Becquerel Option D: 1896, Henri Becquerel Answer: D

36.) An aqueous solution has a normal Boiling point of  $105.0^{\circ}$  C. What is the freezing point of this solution? For water Kb is  $0.51^{\circ}$  C/m and Kf =  $1.86^{\circ}$  C/m.

Option A: 14.7° C Option B: -14.7° C Option C: 18.2° C Option D: -18.2° C Answer: D

35.) How will the osmotic pressure of an aqueous solution change as evaporation occurs?

Option A: The osmotic pressure will increase Option B: The osmotic pressure will not change Option C: The osmotic pressure will decrease Option D: The osmotic pressure will increase or decrease until it equals the vapor pressure of water

## Answer: A

34.) Which group of elements react violently with water?

Option A: Halogens Option B: Noble gases Option C: Alkali metals Option D: Alkaline earth metals Answer: C

33.) Elements in a periodic group have similar

Option A: Chemical Properties Option B: Densities Option C: Masses Option D: Physical Answer: A

32.) What is the minimum energy barrier that must be overcome for a chemical reaction to occur?

Option A: Activation Energy Option B: Net Energy Option C: Potential Energy Option D: Rate limiting energy Answer: A

31.) Using the method of initial rates for the reaction A  $\rightarrow$  B, if the initial concentration of A is doubled and the rate of reaction quadruples, what is the order of reaction with respect to A?

Option A: Zeroth Option B: First Option C: Second Option D: Fourth Answer: C

30.) HBr, HCl, HClO4, KBr, and NaCl are all classified as

Option A: Acids Option B: Nonelectrolytes Option C: Strong electrolytes Option D: Weak electrolytes Answer: C

29.) Water is an example of

Option A: A compound Option B: An element Option C: A mixture Option D: An ion Answer: A

28.) Chlorine belongs to the \_\_\_\_\_ group of the periodic table.

Option A: Alkali metal Option B: Alkaline earth metal Option C: Halogen Option D: Noble gas Answer: C

27.) What is the identity of the element with 6 protons, 7 neutrons, and 6 electrons?

Option A: C Option B: N Option C: Al Option D: Mg Answer: A

26.) Medeleev arranged the elements according to

Option A: Atomic Number and atomic weight Option B: Atomic weight and Chemical Reactivity Option C: Electron configuration and atomic weight Option D: Physical state and relative abundance Answer: B

25.) The fundamental SI unit of mass is the \_\_\_\_\_.

Option A: Kilogram Option B: Kelvin Option C: Meter Option D: mL Answer: A

24.) Most of the Alpha particles directed at a thin gold foil in Rutherford's experiment

Option A: Bounced back directly from the foil Option B: Passed directly through the foil undeflected Option C: Passed through the foil but we're deflected at an angle Option D: We're absorbed by the foil Answer: B

23.) The volume of 350mL of gas at  $25^{\circ}$  C is decreased to 250mL at constant pressure. What is the final temperature of the gas?

Option A: -60.1° C Option B: 213° C Option C: 17.8° C Option D: 144° C Answer: A

22.) An element that has the valence electron configuration  $3s^2 3p^3$  belongs to which period and group?

Option A: Period 3; group 3A Option B: Period 3; group 5A Option C: Period 4; group 3A Option D: Period 4; group 5A Answer: B

21.) Isotopes have the same number of \_\_\_\_\_ but different numbers of \_\_\_\_\_ in their nuclei.

Option A: Electron, neutrons Option B: Protons, neutrons Option C: Protons, electron Option D: Nucleon, neutrons Answer: B

20.) Gamma radiation can be described as

Option A: A helium nucleus Option B: A negatively charged free electron Option C: High energy electromagnetic radiation Option D: A positively charged free electron Answer: C

19.) The number of nucleons in an atom or ion is the Same as the

Option A: Atomic Number Option B: Charge on the atom or ion Option C: Mass number Option D: None of these Answer: C

18.) How many grams of chromium metal are plated out when a constant current of 8.00A is passed through an aqueous solution containing  $Cr^3$  + ions for 40.0 minutes?

Option A: 3.45g Option B: 6.15g Option C: 10.3g Option D: 31.0g Answer: A

17.) Given that  $E^{\circ} = +0.897V$ , Calculate E at 25° C for Pb(s) | Pb<sup>2</sup> + (0.0400M) || Fe<sup>-3</sup> + (0.200 M), Fe<sup>2</sup> + (0.0100 M) | Pt(s)

Option A: +0.779V Option B: +0.935V Option C: +1.015V Option D: +1.134V Answer: C

16.) Which cell involves a non-spontaneous redox reaction?

Option A: Concentrated Cell Option B: Electrolytic cell Option C: Fuel Cell Option D: Galvanic cell Answer: B

15.) The biding energy is defined as

Option A: The amount of energy absorbed when electrons are added to an ion. Option B: The amount of energy absorbed when protons and neutrons form a nucleus. Option C: The amount of energy released when electrons are removed from the atom. Option D: The amount of energy required to break apart a nucleus into individual protons and neutrons. Answer: D

14.) Which general rate law below corresponds to an elementary bimolecular reaction?

Option A: Rate = k[B]Option B: Rate = k[A] [B] [C] [D]Option C: Rate =  $k[A] [B]^2$ Option D: Rate =  $k[A]^2$ Answer: D 13.) The rate constant, k, for a first-order reaction is equal to  $0.00042s^{-1}$ . What is the half-life for the reaction?

Option A: 0.00029s Option B: 1200s Option C: 1700s Option D: 2400s Answer: C

12.) Which of the following is not a type of energy or energy transfer?

Option A: Thermal energy Option B: Heat Option C: Height Option D: Work Answer: C

11.) The energy of motion is

Option A: Electrical energy Option B: Dam energy Option C: Reserve energy Option D: Kinetic energy Answer: D

10.) A saturated solution is defined as

Option A: A concentrated solution Option B: A solution that is in equilibrium with pure solute Option C: A solution that is in equilibrium with undissolved solute Option D: A solution that is not in equilibrium with both pure solvent and undissolved solute Answer: C

9.) For a particular process that is carried out at constant pressure, q = 200kJ and w = -85kJ. Therefore,

Option A: dE = 115kJ and dH = 200kJ Option B: dE = 200kJ and dH = 115kJ Option C: dE = 200kJ and dH = 285kJ Option D: dE = 285kJ and dH = 200kJ Answer: A

8.) Which of the following can be interpreted as a measure of randomness?

Option A: Enthalpy Option B: Entropy Option C: Free energy Option D: Temperature Answer: B

7.) Which of the following solutions has the highest concentration of hydroxide ions [OH-]?

Option A: pH = 3.21Option B: pH = 7.83Option C: pH = 10.93Option D: pH = 12.04Answer: D

6.) How many H+ ions can the acid, H2CO3, donate per molecule?

Option A: 0 Option B: 1 Option C: 2 Option D: 3 Answer: C

5.) What ion is provided when Arrhenius bases dissolves in water?

Option A: H+ Option B: Na+ Option C: Cl-Option D: OH-Answer: D

4.) The factor 0.001 corresponds to which prefix?

Option A: Deka Option B: Deci Option C: Centi Option D: Milli Answer: D

3.) Molarity is defined as

Option A: Moles of solute per liter of solution Option B: Moles of solute per liter of solvent Option C: Moles of solvent per liter of solution Option D: Moles of solvent per liter of solvent Answer: A

2.) Chemical equations are balanced in order to obey the law of

Option A: Definite Proportions Option B: Mass Action Option C: Mass conservation Option D: Multiple Proportions Answer: C

1.) How many milliliters of a 6.0 M HNO3 solution are needed to make 0.25L of a 3.5 M HNO3 solution?

Option A: 686mL Option B: 428mL Option C: 146mL Option D: 119mL Answer: C