**Chemistry NC Final Exam MUST HAVES – MEMORIZE!!**

1. **Unit 1 - SI Units/Measurements/Metric Conversions**
   1. Metric Line (Conversions): Giga (G) 🡪 pico (p)
   2. Dimensional Analysis (factor labeling) set up
   3. Scientific Notation
   4. Significant Figures rules
2. **Unit 2 – Atomic Theory & Structure**
   1. Mass #, #p+ , #n0 , #e-
   2. Isotopes
   3. Ions – Cations vs Anions
   4. Wave Calculations
      1. C = λν 🡪 C = 3.00 x 108 m/s (speed of light constant)
      2. E = hν 🡪 h = 6.626 x 10-34 J/s (Planck’s Constant)
   5. Tail-to-Tip Chart for ALL electron configurations
      1. Long-Hand (standard/full)
      2. Orbital Notation
      3. Noble Gas Notation (short-hand)
   6. Valence Electron counts
3. **Unit 3 – Periodic Table**
   1. History & Groups/Families of the PT
   2. Periodic Trends – Atomic Radius/Ionization Energy/Electronegativity & reasons
4. **Unit 4 – Nomenclature & Bonding**
   1. ALL nomenclature rules – Ionic/Covalent (Molecular)/Acids & Bases
   2. Ionic vs Covalent bonding
   3. Draw Lewis Structures
      1. Molecular Geometry (MG) shapes & VSEPR: Linear 🡪 Tetrahedral
5. **Unit 5 – Chemical Reactions**
   1. Balance chemical equations
   2. 5 major reaction types & special (complex) cases 🡪 Reference sheet
      1. Predicting products
   3. Net Ionic Equations
6. **Unit 6 – Moles**
   1. Molar mass
   2. Mole conversions via dimensional analysis
      1. Mole <--> Particles
      2. Mole <--> Mass
      3. Particles <--> Mass
   3. Empirical Formula (EF) vs Molecular Formula (MF) & Hydrates
7. **Unit 7 – Stoichiometry**
   1. Stoich calculations via dimensional analysis
      1. Mole <--> Mole
      2. Mole <--> Mass
      3. Mole <--> Particles
      4. Mass <--> Mass
      5. Particles <--> Particles
   2. Limiting Reactants (LR) vs Excess Reactants (ER)
   3. % Yield & % Error
8. **Unit 8 – Gases**
   1. ALL gas laws & relationships
      1. Kinetic Molecular Theory (KMT)
      2. Boyle’s/Charles’s/Gay-Lussac’s/Combined/Ideal Gas/Partial Pressure
      3. Gas Stoichiometry calculations
      4. Phase Changes & Phase diagrams
      5. Heating curves
   2. Intermolecular Forces (IMF)
9. **Unit 9 – Solutions & Equilibrium**
   1. Solubility Rules 🡪 Reference Sheet
   2. Molarity calculations 🡪 M=mol/L
   3. Dilution calculations 🡪 M1V1=M2V2
   4. Solubility Curves & calculations
   5. Equilibrium Constant expressions K = [P]/[R] & LeChatelier’s Principle
10. **Unit 10 – Acids & Bases**
    1. A/B Definitions – Lewis/Arrhenius/Bronsted-Lowry
    2. pH calculations (pH box)
    3. Titrations & calculations
11. **Unit 11 – Thermochemistry**
    1. Specific Heat calculations 🡪 q=mCpΔT
    2. Phase Change heat calculations 🡪 q=mΔH
    3. Potential Energy diagrams