SNC 1D EXAM REVIEW

Sample Structure:
- Part 1: Multiple Choice 45 Marks
- Part 2: Labeling Diagrams 20 Marks
- Part 3: Short Answer 28 Marks
- Part 4: Long Answer 27 Marks
- Total 120 Marks

- This written exam is worth 20% of your final course mark.
- A periodic table and equations will be provided.
- Please keep in mind that this review is intended as a guide only. There is no replacement for your own determination of the topics and concepts that you feel are most important in the course. Please also consider that the exam is equally weighted amongst the four different units.

UNIT: CHEMISTRY

Topics to Study:
- use appropriate terminology related to atoms, elements, and compounds, including, but not limited to: boiling point, mixtures, particle theory, pure substances, and viscosity
- identify the physical and chemical properties of common elements and compounds (e.g., magnesium sulfate, water, carbon)
- distinguish substances by their physical and chemical properties (e.g., physical properties: hardness, conductivity, colour, melting point, solubility, density; chemical properties: combustibility, reaction with water)
- identify different chemical tests of some common gases (e.g., oxygen, hydrogen, carbon dioxide) on the basis of their chemical properties
- explain how different atomic models evolved as a result of experimental evidence (e.g., how the Thomson model of the atom changed as a result of the Rutherford gold-foil experiment)
- describe the characteristics of neutrons, protons, and electrons, including charge, location, and relative mass
- distinguish between elements and compounds (e.g., compounds are pure substances that can be broken down into elements by chemical means)
- describe the characteristic physical and chemical properties of common elements and compounds (e.g., aluminum is a good conductor of heat)
- describe patterns in the arrangements of electrons in the first 20 elements of the periodic table, using the Bohr- Rutherford model
- explain the relationship between the atomic structure of an element and the position of that element in the periodic table
- compare and contrast the physical properties of elements within a group (e.g., alkali metals) and between groups (e.g., the carbon group and noble gases) in the periodic table
- identify and use the symbols for common elements (e.g., C, Cl, S, N) and the formulae for common compounds (e.g., H₂O, CO₂, NaCl, O₂)
- solve simple problems involving density D, mass M, and volume V, using the quantitative relationship D = M / V
- count atoms in molecules (e.g., 4 Pb(NO₃)₂)
UNIT: ELECTRICITY

Topics to study:

- use appropriate terminology related to electricity, including, but not limited to: ammeter, amperes, battery, current, fuse, kilowatt hours, load, ohms, potential difference, resistance, switch, voltmeter, and volts
- identify the transfer of static electric charges by friction, contact, and induction, and produce labelled diagrams to explain the results
- predict the ability of different materials to hold or transfer electric charges (i.e., to act as insulators or conductors)
- design, draw circuit diagrams of, and construct series and parallel circuits (e.g., a circuit where all light bulbs go out when one light bulb is removed; a circuit that allows one of several light bulbs to be switched on and off independently of the others), and measure electric current \( I \), potential difference \( V \), and resistance \( R \) at various points in the circuits, using appropriate instruments and SI units
- analyse and interpret the effects of adding an identical load in series and in parallel in a simple circuit
- investigate the quantitative relationships between current, potential difference, and resistance in a simple series circuit
- solve simple problems involving potential difference \( V \), electric current \( I \), and resistance \( R \), using the quantitative relationship \( V = I \times R \)
- determine the energy consumption of various appliances, and calculate their operating costs (e.g., using the kilowatt hour rate from a utility bill)
- calculate the efficiency of an energy converter, using the following equation: percent efficiency \( = \frac{E_{\text{out}}}{E_{\text{in}}} \times 100\% \)
- identify electrical quantities (i.e., current, potential difference, resistance, and electrical energy), and list their symbols and their corresponding SI units (e.g., electric current: \( I \), ampere)
- explain the characteristics of conductors and insulators and how materials allow static charge to build up or be discharged
- compare and contrast static electricity with alternating current (AC) and direct current (DC) (e.g., the charge on a charged electroscope, the charge in a functioning circuit)
- identify the components of a simple DC circuit (e.g., electrical source, load, connecting wires, switch, fuse), and explain their functions
- explain the characteristics of electric current, potential difference, and resistance in simple series and parallel circuits, noting how the quantities differ in the two circuits
- describe, qualitatively, the interrelationships between resistance, potential difference, and electric current (e.g., the effect on current when potential difference is changed and resistance is constant)
- explain what different meters (e.g., ammeters, voltmeters, multimeters) measure and how they are connected within an electrical circuit to measure electrical quantities
- explain how various factors (e.g., wire length, wire material, cross-sectional area of wire) influence the resistance of an electrical circuit
UNIT: ECOLOGY

Topics to study:

- use appropriate terminology related to sustainable ecosystems, including, but not limited to: bioaccumulation, biosphere, diversity, ecosystem, equilibrium, sustainability, sustainable use, protection, and watershed.
- interpret qualitative and quantitative data from undisturbed and disturbed ecosystems (terrestrial and/or aquatic), explain the importance of biodiversity for all sustainable ecosystems.
- explain how human activity affects soil composition or soil fertility (e.g., changes to soil composition resulting from the use of different compostable materials, organic or inorganic fertilizers, or pesticides), and explain the impact of this activity on the sustainability of terrestrial ecosystems.
- explain how human activity affects water quality (e.g., leaching of organic or inorganic fertilizers or pesticides into water systems, changes to watersheds resulting from deforestation or land development, diversion of ground water for industrial uses), and explain the impact of this activity on the sustainability of aquatic ecosystems.
- analyse the effect of human activity on the populations of terrestrial and aquatic ecosystems (e.g., stressors associated with human use of natural areas, such as trampled vegetation, wildlife mortality from motor vehicles, and the removal of plants, animals, and/or natural objects; suburban developments and their impact on the food supply for animals such as foxes and racoons).
- compare and contrast biotic and abiotic characteristics of sustainable and unsustainable terrestrial and aquatic ecosystems.
- describe the complementary processes of cellular respiration and photosynthesis with respect to the flow of energy and the cycling of matter within ecosystems (i.e., carbon dioxide is a by-product of cellular respiration and is used for photosynthesis, which produces oxygen needed for cellular respiration), and explain how human activities can disrupt the balance achieved by these processes (e.g., automobile use increases the amount of carbon dioxide in the atmosphere; planting more trees decreases the amount of carbon dioxide in the atmosphere).
- describe the limiting factors of ecosystems (e.g., nutrients, space, water, energy, predators), and explain how these factors affect the carrying capacity of an ecosystem (e.g., the effect of an increase in the moose population on the wolf population in the same ecosystem).
- identify the earth’s four spheres (biosphere, hydrosphere, lithosphere, atmosphere), and describe the relationship that must exist between these spheres if diversity and sustainability are to be maintained.
- identify various factors related to human activity that have an impact on ecosystems (e.g., the introduction of invasive species; shoreline development; industrial emissions that result in acid rain), and explain how these factors affect the equilibrium and survival of ecosystems (e.g., invasive species push out native species and upset the equilibrium in an ecosystem; shoreline development affects the types of terrestrial and aquatic life that can live near lake shores or river banks; acid rain changes the pH of water, which affects the type of aquatic life that can survive in a lake).
UNIT: SPACE

Topics to study:

- use appropriate terminology related to the study of the universe, including, but not limited to: celestial objects, orbital radius, retrograde motion, and satellite
- use star charts to determine the location, appearance, and motion of well-known stars and other celestial objects that are visible in the night sky (e.g., the stars Polaris, Sirius, Betelgeuse; the planet Venus)
- analyse the properties of specific celestial objects within the solar system (e.g., the composition of their atmosphere, if any; the composition of their surface; the strength of their gravitational pull)
- compare and contrast properties of celestial objects visible in the night sky (e.g., compare the size of planets; represent the distance of stars from Earth using scientific notation; compare star temperatures and colour)
- describe observational and theoretical evidence relating to the origin and evolution of the universe (e.g., evidence supporting the big bang theory)
- describe observational and theoretical evidence relating to the formation of the solar system (e.g., evidence that supports the theory that the solar system was formed from a contracting, spinning disc of dust and gas)
- describe the major components of the solar system and the universe (e.g., planets, stars, galaxies), using appropriate scientific terminology and units (e.g., astronomical units, scientific notation, light years)
- describe the sun’s composition and energy source, and explain how its energy warms Earth and supports life on the planet (e.g., with reference to the types of radiation the sun emits and the interaction of the sun’s energy with Earth’s atmosphere)
- explain the causes of astronomical phenomena (e.g., the aurora borealis, solar eclipses, phases of the moon, comets) and how various phenomena can best be observed from Earth (e.g., solar eclipses should be viewed through a suitable solar filter or by projection, not with the naked eye)
- describe various reasons that humankind has had for studying space (e.g., to develop calendars for agricultural purposes, to forecast weather, for celestial navigation, for religious inspiration) and the conceptions of the universe held by various cultures and civilizations (e.g., Aboriginal peoples; ancient Greek, Mayan civilizations)

Please bring the following with you to your exam;

- Pencil
- Eraser
- Calculator
- Textbook x 2

Have fun studying!