SNC2D7

Exam Review 2015

Use the following as a study guide to help you prepare for the final exam. Although this list is a good starting point, **the list is not exhaustive,** therefore do not limit yourself to only the topics listed here.

HEAT

- ☐ Kinetic molecular theory of heat
- ☐ Methods of heat transfer
  - radiation, conduction, convection
- ☐ Specific heat capacity and heat capacity
  - $Q = m\,c\triangle T$
- ☐ Calculations involving calorimeters (ie: heat lost = - heat gained)
- ☐ Latent heat
  - $Q = m\ell_f$ and $Q = m\ell_v$

EARTH AND SPACE SCIENCE - Climate Change

- ☐ Weather vs. Climate
- ☐ Solar energy and weather – absorption and reflection of radiation
- ☐ Components of the climate system
  - Atmosphere, lithosphere, hydrosphere, biosphere
- ☐ Energy transfer within climate system - oceans and atmosphere (convection currents)
- ☐ Albedo effect
- ☐ Greenhouse effect
  - Greenhouse gases (carbon dioxide, methane, water vapour, nitrous oxide)
  - Anthropogenic greenhouse effect
  - Reducing greenhouse gas emissions
- ☐ Studying Earth's climate
  - Methods – ice core samples, rock, ocean sediment and cave samples, tree ring and coral samples
- ☐ Evidence of climate change
  - Rising temperature
  - Melting glaciers, sea ice and ice sheets
  - Rising sea levels
  - Changes in severe weather
  - Changes in precipitation patterns
  - Changing ecosystems
  - Changing seasons
- ☐ Long-term and short-term climate change
  - Long-term – continental drift, changes in Earth's orbit (Milankovitch cycles), interglacial periods
  - Short-term – volcanic eruptions, air and ocean currents (El Niño)
- ☐ What can we do about climate change? Solutions, and possible challenges to implementing change

CHEMISTRY – Chemical Reactions

- ☐ Physical changes vs. Chemical changes
- ☐ Elements vs. Compounds
- ☐ Period trends - Describe trends in ionic charge, in valence electrons, in physical and chemical properties of elements
- ☐ Bohr-Rutherford and Lewis-Dot diagrams, orbital diagrams and electron configuration
  - Use these diagrams to illustrate how atoms form ionic or covalent compounds
- ☐ Properties of Ionic and Covalent compounds
- ☐ Nomenclature
  - Ionic compounds
  - Covalent compounds (including diatomic molecules)
  - Polyatomic compounds (*these will be provided to you on the test)
- ☐ Balancing chemical equations
- ☐ Types of Reactions
  - Synthesis, decomposition, single displacement, double displacement
- ☐ Combustion (complete and incomplete)
- ☐ Corrosion

- ☐ Predict the products of a chemical reaction based on the reactants
- ☐ Write a balanced chemical equation given a word equation
- ☐ Acids and Bases
    - Recognize examples of acids and bases (both common names and chemical formulae)
    - Describe what makes an acid or a base? (Describe in terms of concentration of H^+ or OH^- ions)
    - Understand how to use the pH scale to describe substances as acidic or alkaline
    - Know a variety of indicators (red/blue litmus, phenolphthalein) and their colour changes in an acidic or alkaline solution
        - Identify a neutralization reaction
        - recognize as a reaction between a base and an acid with products as a "salt" and water
        - the pH of the reaction "neutralizes" (brings it closer to a neutral pH of 7)

PHYSICS – Light and Geometric Optics

- ☐ Electromagnetic spectrum and waves
- ☐ Production of light
    - incandescence, phosphorescence, fluorescence, chemiluminescence, bioluminescence, triboluminescence, light emitting diode (LED)
- ☐ The ray model of light
- ☐ Reflection in mirrors (plane and curved)
    - Characteristics of images in plane mirrors (SALT)
    - Ray diagrams
    - Laws of reflection
    - Characteristics of images in convex and concave mirrors
- ☐ Refraction of Light
    - Phenomena related to refraction (rainbows, mirage, apparent depth, shimmering)
    - Partial reflection
    - Refraction calculations (index of refraction, speed of light, angle of refraction – Snell's Law)
- ☐ Formation of images in lenses
    - Characteristics of objects in converging and diverging lenses
    - Ray diagrams
    - Thin lens equation (di, do, hi, ho, f) – sign conventions
    - Applications of lenses (camera, movie projector, compound microscope, magnifying glass, refracting telescope)
    - Human eye – parts and function, problems (hyperopia, presbyopia, myopia) and how to fix them with lenses

BIOLOGY – Tissues, Organs and Systems of Living Things

- ☐ Plant/Animal cells
- ☐ Cell organelles – parts and functions
- ☐ Cell cycle - Phases of mitosis, interphase, cytokinesis
- ☐ Cell specialization and stem cells
- ☐ Hierarchy of structure
    - Cells → Tissues → Organs → Organ systems
- ☐ Tissues
    - Animal & plant
- ☐ Systems
    - Parts, functions, interactions with other systems
- ☐ Plant Tissues and Systems
    - Parts of a leaf (ie: leaf cross-section)
    - Root and shoot systems