

SNC2D(N) FINAL EXAM REVIEW

Length of Exam: 1.5 hours

Attached: periodic table, table of common polyatomic ions names/formulas & multivalent ions

Required materials: calculator (no sharing or use of phones), ruler, pencil, eraser

PART A: Multiple choice (40 marks)

PART B: Diagrams (20 marks)

PART C: Short answer (40 marks)

UNIT 1 - BIOLOGY

1. Describe the structure, function and location of cell structures and organelles.
Nucleus, cytoplasm, mitochondria, chloroplast, Golgi apparatus (bodies), Endoplasmic reticulum (smooth & rough), lysosome, vacuole, centrioles, cell membrane, cell wall....
2. Describe 2 specialized cells in the human body & specific organelles they contain and why
3. Differentiate between animal and plant cells; prokaryotic and eukaryotic cells; stem & specialized cells.
4. Describe the phases of the cell cycle & mitosis
5. Identify the stages of mitosis in plant and animal cells
6. How do cancer cells behave differently than healthy cells?
7. What are the 4 different types of tissues & their functions?
8. What are the major functions & organs in each animal organ system?
9. Describe the process of digestion, respiration, and circulation and the specialized structures that aid in the processes.
10. Organ systems work together to make up the organism. Give specific examples of interactions between organ systems.
11. Identify the tissues & systems found in plants and their functions.

UNIT 2- OPTICS- FORMULAS WILL NOT BE GIVEN!

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i} \quad M = \frac{h_i}{h_o} = -\frac{d_i}{d_o} \quad n = \frac{c}{v}$$

1. Describe the various ways light can be produced. (ie. bioluminescence, chemiluminescence, incandescence)
2. What is the speed of light?
3. State the law of reflection (from a plane mirror). Use a labelled diagram to explain your answer.
4. What is the difference between luminous and non-luminous?
5. What is the difference between reflection and refraction?
6. Compare and contrast virtual and real images. Give a situation when each would be produced.
7. What are the possible image characteristics in a convex and concave mirror? Draw ray diagrams to support your answer
8. What are the possible image characteristics in a diverging and converging lens? Draw ray diagrams to support your answer.
9. What is a converging mirror also known as? Diverging mirror? WHY?
10. Use SALT to describe an image created from a plane mirror.
11. Describe how light refracts when going from more optically dense to less optically dense mediums and vice versa.
12. Determine image characteristics for an object 2 cm high, placed in front of a converging lens with a focal length of 24 cm at a distance of 10 cm. SHOW ALL YOUR WORK!
13. Light travels from air into a diamond ($n= 2.42$). What is the speed of light in the diamond? SHOW WORK!

UNIT 3- CHEMISTRY

1. Determine the number of protons, neutrons and electrons in an atom and ion of an element (ie nitrogen).
2. What are the charges and locations of the following: protons, neutrons, electrons.
3. What is a cation? How and why does it form? What is an anion? How and why does it form?
4. Explain how to correctly determine the number of atoms, cations & anions in ionic compounds. (ie. NaOH, Ca₃(PO₄)₂, Li₂O, H₂SO₄).
5. How can you use the periodic table to identify the number of valence electrons for a particular element? Use an example.
6. How can you use the periodic table groups to identify the ionic charge of the elements in each group?
7. Compare and contrast elements and compounds. Give examples.
8. Compare and contrast between ionic and covalent bonds? Give an example for each.
9. Complete the following table.

Compound	NH ₃	Mg(OH) ₂	Li ₃ PO ₄
Ionic or Covalent?			
Name			
Total number of atoms			

10. State the law of conservation of mass and how it relates to balancing equations.
11. What are the starting substances and final substances called in a chemical reaction?
14. Complete AND balance the equation below.



15. State the 6 types of chemical reactions learned in this unit. Give an example of each.
16. State the 7 diatomic elements.
17. How can you identify an acid? A base? Give an example for each.
18. Describe properties of acids and bases.
19. How can the pH scale be used to identify acids and bases?
20. Give the names or formulas for the following.

Name → Formula	Formula → Name
Sodium sulfide	H ₂ CO ₃
Aluminum sulfate	LiF
Tin (II) iodide	SiO ₂
Fluorine gas	CF ₄
Iodine heptachloride	NH ₃ Cl
Dinitrogen tetroxide	CuSO ₄

21. Identify the following reaction types:

- a) $\text{HCl} + \text{AgNO}_3 \rightarrow \text{HNO}_3 + \text{AgCl}$
- b) $\text{C}_7\text{H}_{16} + 11\text{O}_2 \rightarrow 7\text{CO}_2 + 8\text{H}_2\text{O}$
- c) $\text{P}_4\text{O}_{10} + 6\text{H}_2\text{O} \rightarrow 4\text{H}_3\text{PO}_4$
- d) $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$
- e) $2\text{H}_3\text{PO}_4 \rightarrow \text{H}_4\text{P}_2\text{O}_7 + \text{H}_2\text{O}$

22. Write balanced chemical equations for the following reactions:

- a) Aluminum reacting with oxygen in the air.
- b) Copper (II) sulphate reacting with iron (III) hydroxide.

UNIT 4- CLIMATE CHANGE

1. Explain the greenhouse effect & the main greenhouse gases
2. List the evidence for climate change.
3. Describe some of the solutions we can take to reduce climate change.
4. Identify the factors that affect climate.