# Year 12 Chemistry Self-Assessment Organic and Biological Chemistry

### Topic 4.9: Proteins

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| ***Expectation***  From SACE Subject Outline | ***4.9-4.11***  ***Test Q*** | ***Proficiency***  (beginning/sometimes/proficient) | ***Comments/questions*** | ***Assignment question(s)*** |
| Determine whether or not a compound is an amino acid, given its structural formula. | **-** |  |  |  |
| Draw the structural formula of the product formed when an amino acid self-ionises. | **1(e)** |  |  | Assignment 3 Q1(b) |
| Identify the amide group and deduce the structural formula(e) of the monomer(s), given the structural formula of a section of a protein. | **1(a)-(b)** |  |  |  |
| Write the general formula of amino acids and recognise their structural formulae. | **-** |  |  | Assignment 3 Q1(h) |
| Identify where hydrogen bonding can occur between protein chains or between the chain and water, given the structural formula of a section of the chain. | **-** |  |  | Assignment 3 Q1(f) |
| Explain why the biological function of a protein (e.g. an enzyme) is altered if its spatial arrangement is altered. | **1(d)** |  |  | Assignment 3 Q2(a) |
| Explain why proteins are sensitive to changes in pH and temperature. | **-** |  |  | Assignment 3 Q2 |

### Topic 4.10: Triglycerides

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| ***Expectation*** | ***4.9-4.11***  ***Test Q*** | ***Proficiency*** | ***Comments/questions*** | ***Assignment question(s)*** |
| Draw the structural formula of an edible oil or fat, given the structural formula(e) of the carboxylic acid(s) from which it is derived. | **-** |  |  | Assignment 3 Q3(a) |
| Identify the alcohol and acid(s) from which a triglyceride is derived, given its structural formula. | **3(a)** |  |  | Assignment 3 Q3(b) |
| Identify the most likely source of a triglyceride, given its state at 25°C. | **2** |  |  | Assignment 3 Q3(c) |
| Describe and explain the use of a solution of bromine or iodine to determine the degree of unsaturation of a compound. Draw the structural formula of the reaction product. | **3(b)** |  |  | Assignment 3 Q3(d)  Assignment 3 Q3(e) |
| Explain the role of pressure, temperature, and a catalyst in the hydrogenation of liquid triglycerides. | **3(c)-(d)** |  |  | Assignment 3 Q3(f) |

### Topic 4.11: Carbohydrates

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| ***Expectation*** | ***4.9-4.11***  ***Test Q*** | ***Proficiency*** | ***Comments/questions*** | ***Assignment question(s)*** |
| Given its structural formula, determine the molecular formula of an organic compound, and whether or not it is a carbohydrate. | **4(a)** |  |  |  |
| Write molecular formulae for glucose, and for disaccharides and polysaccharides based on glucose monomers. | **-** |  |  |  |
| Identify the repeating unit and draw the structural formula of the monomer, given the structural formula of a section of a polysaccharide derived from one monomer. | **-** |  |  |  |
| Explain the ability of glucose to react as an aldehyde when in chain form but not when in ring form. | **4(b)** |  |  | Assignment 3 Q4(c),(d) |
| Explain the differences in solubility in water of simple carbohydrates and polysaccharides in terms of the size of the molecules and the number of hydroxyl groups. | **4(c)** |  |  | Assignment 3 Q4(b) |