Examples of Different Question Types

- Complex and simple lipids. Main classes of hydrolysable lipids, hydrolysis reactions with mechanism.
- Fatty acids: functional groups and reactivity.
- Structure of triglycerides: functional groups and reactivity. Comments on the preparative methods of biodiesel.
- Define absolute and relative configuration. Draw and assign the correct stereochemistry to D-alanine and S-serine.
- Reducing and non-reducing sugars: formation of glycosides.
- Anomers of monosaccharides. Definition of anomers and discussion of the mutarotation of glucose.
- α and β-glycosidic linkage in polysaccharides: draw and compare the structures of amylose and cellulose.
- Aminoacids, examples of the following: a) a secondary alcohol; b) an amide; c) a thiol; d) a sulfide; e) a phenol; f) a side chain primary ammonium; g) a side chain carboxylate h) a secondary amine.
- Nitrogen protecting groups in peptide synthesis: main protecting reactions (with reaction mechanism).
- Carboxylic acid protecting groups in peptide synthesis: main protecting reactions (with reaction mechanism).
- Protecting Groups: orthogonal and modulated liability protecting groups. Explain with examples the two strategies.
- Calculate the molar concentration of a molecule dissolved in water (ε_{260} = 10000 $M^{-1}cm^{-1}$) knowing that the UV absorbance of the solution (diluted 1:100) is equal to 0.5.
- Give a brief description of the ^{1}H-NMR spectrum of cinnamic acid (structure attached): Assign all resonances. Discuss the assignments in terms of: a) chemical shift; b) multiplicity (with diagram); c) integral.