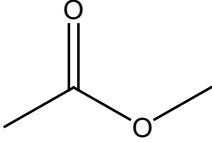
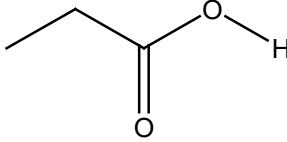


Diploma of Health Sciences
Diploma of Science
SLE155 Chemistry for the Professional Sciences

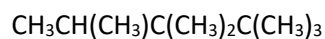
Question 1

[1 + 1 = 2 marks]

- a) Examine the pair of molecules below and indicate if they are identical, isomers, or unrelated.

	
identical / isomers / unrelated	

- b) Draw the line structure that corresponds to the following condensed structure:



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Question 2

[2 marks]

Write the Lewis structure for the following molecule:

Include all non-zero formal charges where appropriate. If resonance structures exist, you only have to draw one structure.



--

Question 3**[1 mark]**

Which is the shorter bond length, $C = C$ or $C \equiv C$? Explain the factors that influenced your choice.

Question 4**[2 marks]**

- Give the Lewis structure for the hydronium ion, H_3O^+ .
- Draw and name the molecular shape of the **molecule** (how the atoms are arranged).
- Indicate if the molecule overall is polar or non-polar.

a. Lewis structure drawing	b. Drawing and name of shape of molecule
c. Polar or non-polar?	

Question 5**[3 marks]**

Determine the type of orbitals (atomic, sp^3 , sp^2 , or sp) used by each atom indicated in the molecule shown below.

The molecule consists of a cyclohexene ring substituted with a methyl group and a prop-1-en-1-yn-1-yl group. The prop-1-en-1-yn-1-yl group is further substituted with a methyl group and a 2-methoxyethyl group. Labels a-f point to the following atoms: a) quaternary carbon of the cyclohexene ring; b) internal carbon of the alkyne group; c) internal carbon of the first alkene group; d) carbon of the second alkene group; e) oxygen atom of the methoxy group; f) hydrogen atom of the methoxy group.

Atom a)	Atom d)
Atom b)	Atom e)
Atom c)	Atom f)

Selected Elements and Atomic Masses/u