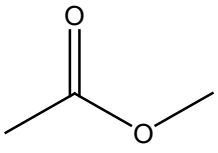
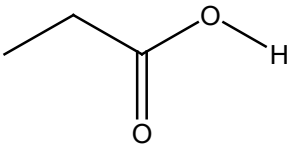
Diploma of Health Sciences
Diploma of Science
SLE155 Chemistry for the Professional Sciences

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:

$CH_3CH(CH_3)C(CH_3)_2C(CH_3)_3$

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.

CO_3^{2-}

Question 3 **[1 mark]**

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

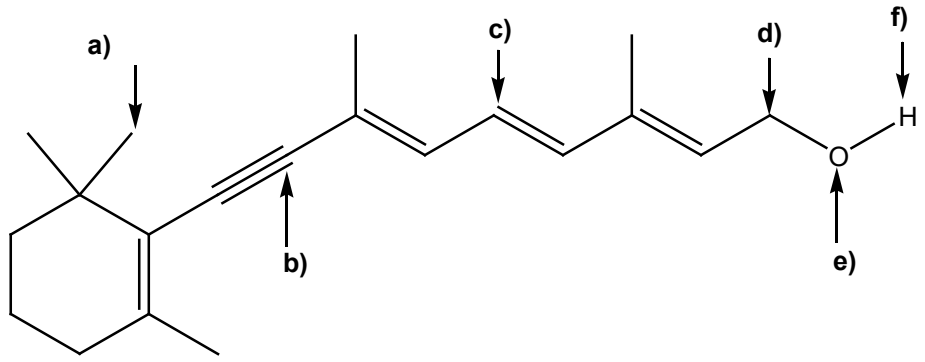
Question 4 **[2 marks]**

a. Give the Lewis structure for the hydronium ion, H_3O^+.
b. Draw and name the molecular shape of the **molecule** (how the atoms are arranged).
c. 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 <u>each</u> atom indicated in the molecule shown below.



Atom a)… ……..

Atom b)… ……..

Atom c)… ……..

Atom d) … ……

Atom e) … ……

Atom f) … …….

Selected Elements and Atomic Masses/u