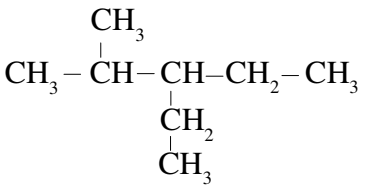
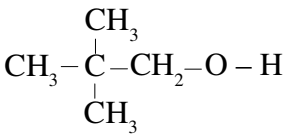
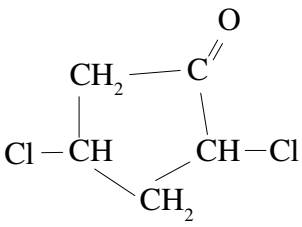
ORGANIC PRACTICE TEST 1 SOLUTIONS

1.

(a)	(b)	(c)
		

2.

(a) 1(b) would be more soluble as it has more polar functional groups which can form hydrogen bonds with water and hence dissolve.

(b) 1(b) would have a higher boiling point

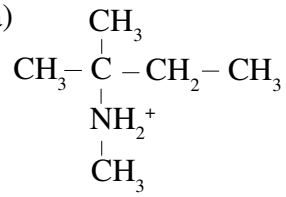
3.

(a) 4 methyl 4 ethyl hexanal

(b) 2,2 dimethyl butanoic acid

(c) N,2 dimethyl 2-butanamine

4.

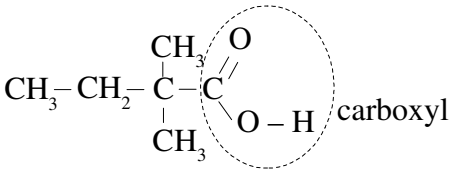
(a) 

(b) A carboxyl group has a very polar O-H bond which enables strong hydrogen bonds between molecules

(c) 3(a) as its aldehyde group is able to be oxidised

(d) A 'silver mirror' forms

5.

(a) 

(b) (possible options: propyl propanoate, ethyl butanoate, butyl ethanoate, methyl pentanoate, pentyl methanoate)

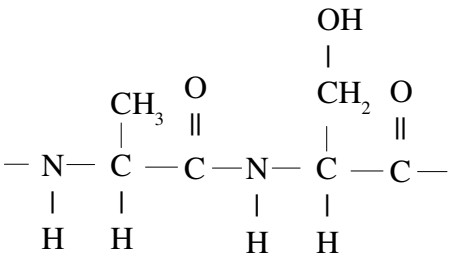
(c) They have the same molecular formula (same number of each element)

(d) (for example if your ester was ethyl butanoate:) [note formulae should be drawn *not* just names as below]
(ethanol + butanoic acid $\xrightarrow{\text{reflux / } H_2SO_4}$ ethyl butanoate + water)

6.

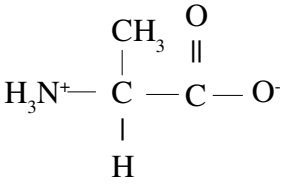
(a) Amino (amine)

(b) Amide

(c) 

(d) A proton is transferred from the carboxyl group to the amine group in the same molecule

(e)



(f) One has a polar side chain, the other a non-polar. Secondary interactions will be different, therefore the 3D shape will be different, therefore the biological function will be different.
(g) Covalent
(h) Stronger

7.
(a) Acidified dichromate
(b) Hydroxyl
(c) Heat
(d) Green. 1 (b) is a primary alcohol so it will be oxidised, in the process reducing dichromate to green chromium ions.
(e) If there is more than can be reduced by the alcohol, the mixture will remain orange.