ORGANIC PRACTICE TEST 1 QUESTIONS

1. Draw structural formulae for the following:

- (a) 2 methyl 3 ethyl pentane
- (b) dimethyl propan-1-ol
- (c) 2,4-dichlorocyclopentan-1-one

2.

- (a) State and explain whether you would expect compound 1(a) or 1(b) to be more soluble in water. /2
- (b) State whether you would expect compound 1(a) or compound 1(b) to have a higher boiling point. /1

3. Systematically name the following:

(a)	(b)	(c)
CH ₃ O	CH ₃ O	CH ₃
$CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - C_2$	$CH_3 - CH_2 - C - C$	$CH_3 - C - CH_2 - CH_3$
CH ₂ H	CH. $O-H$	NH
CH ₃	3	CH ₃
/3	/3	/3

4.

- (a) Draw the structural formula for the organic product when the compound in 3 (c) is treated with acid. /2
- (b) Explain why the boiling point of the compound in 3(b) is higher than the compound in 3 (a). /1
- (c) Explain which of compounds 3(a) or 3(b) would react with Tollens' reagent.
- (d) State an observation that would indicate Tollens' reagent had reacted.
- 5. Consider the structural formula of the compound in 3 (b):
 - (a) Circle and name any functional groups
 - (b) Draw the structural formula of an isomeric ester of the compound
 - (c) State why compound 5 (b) and compound 3 (b) are classified as isomers
 - (d) Write an annotated equation for the formation of the compound in 5 (b)

6. Amino acid monomers can be joined together to form a protein chain.

- (a) Name the functional group that reacts with the carboxyl group during protein linking.
- (b) Name the functional group that makes up the peptide link between amino acids in a protein chain. /1
- (c) Draw the structural formula of a section of the protein produced by linking of the amino acids below. (expand the skeletal formulae as you do so)



(d) Describe how an amino acid can self-ionise.

- (e) Draw either the chemical structural formula or skeletal structural formula of the zwitterion for alanine. /2
- (f) Explain why replacing the serine units in the protein chain with alanine units would change the biological function of the protein. /2
- (g) State the type of bond holding the H and N atoms together in alanine shown above.
- (h) State whether the type of bond in (g) is weaker or stronger than the secondary interactions that would hold molecules of the amino acid serine together.

7.

- (a) Identify a reagent suitable for the oxidation of a primary alcohol.
- (b) Identify the functional group on the alcohol that reacts during oxidation.
- (c) Identify any other necessary conditions for the reaction of an alcohol with the reagent in 7 (a).
- (d) State and explain the colour of a test tube containing the compound in 1(b) if a small amount of the reagent in 7 (a) is added and the conditions in 7 (c) are met. /2
- (e) Explain why it matters that only a small amount of the reagent is added in 7 (d).

TOTAL /49

/2 /2 /2

12

/1

12

12

/1

13

/1

12

/1

/1

/1

/1

/1

/1