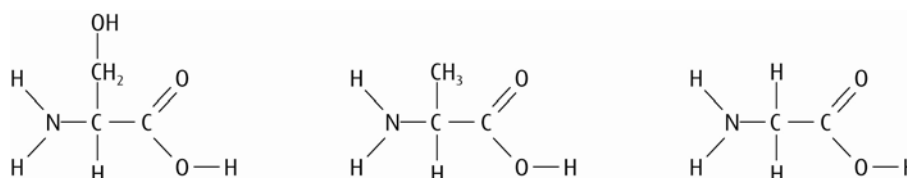


Core Worksheet – Option B

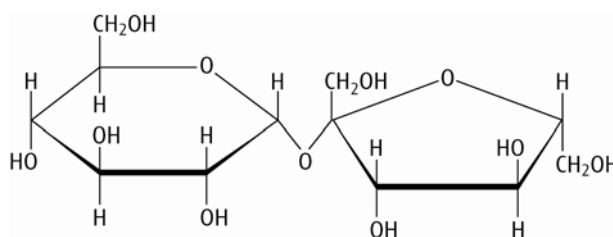
- 1 Three samples of different foods were burnt in a calorimeter to determine the energy value. Use the following data to calculate the energy value of the foods listed, in kJ per 100 g. The specific heat capacity of water is $4.18 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$. [6]

Food	Mass of food / g	Mass of water in calorimeter / g	Initial temperature of water in calorimeter / $^\circ\text{C}$	Maximum temperature of water in calorimeter / $^\circ\text{C}$
A	10.0	200.0	18.5	37.8
B	13.2	500.0	17.3	65.8
C	25.7	1000.0	19.7	71.2

- 2 The structures of three 2-amino acids are shown below:



- a Draw the structures of all possible dipeptides that can be made from these amino acids. [6]
- b What other product is formed in each of the above reactions? [1]
- c Name the functional group that links the amino acids together in the dipeptides. [1]
- 3 The structure of a disaccharide is shown below.

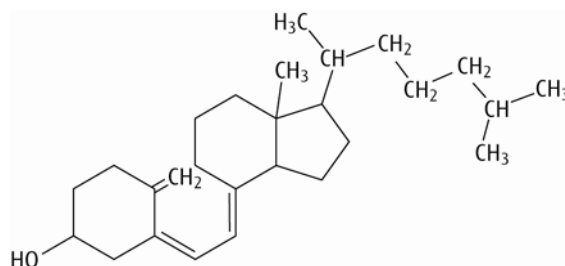


- a Draw the structures of the two monosaccharides from which the disaccharide can be formed. [2]
- b State the molecular formula and empirical formula of each monosaccharide. [2]

- 4 The formulas of three fatty acids are given in the table below.

Fatty acid	Molecular formula
X	$C_{18}H_{36}O_2$
Y	$C_{18}H_{34}O_2$
Z	$C_{18}H_{30}O_2$

- a Calculate the number of C=C bonds in each fatty acid. [3]
- b Determine the iodine number of each fatty acid. [7]
- 5 The structure of a vitamin is shown below.



- Deduce whether this vitamin is soluble in water. [2]