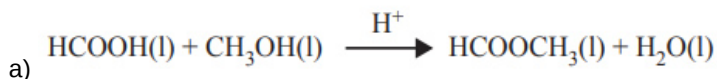


Organic (2018 NHT)

1)



The equation above is an example of what type of reaction?

- A. condensation
- B. denaturation
- C. hydrolysis
- D. addition

Solution will appear here

Solution

b) Pentane, hexane, heptane and octane are non-branched alkanes. Which one of the following statements gives a valid comparison?

- A. Octane has a greater viscosity and a higher boiling point than hexane.
- B. Pentane has a greater viscosity and a lower boiling point than octane.
- C. Heptane has a lower viscosity and a higher boiling point than octane.
- D. Heptane has a lower viscosity and a lower boiling point than pentane.

Solution will appear here

Solution

2) Linoleic acid is a

- A. polyunsaturated omega-6 essential fatty acid.
- B. monounsaturated omega-3 essential fatty acid.
- C. polyunsaturated omega-3 non-essential fatty acid.
- D. monounsaturated omega-6 non-essential fatty acid.

Solution will appear here

Solution

3) Coenzyme A is involved in the synthesis of fatty acids. Coenzyme A is

- A. a vitamin that is a precursor of an enzyme.
- B. the substrate in the synthesis of fatty acids.
- C. required by all enzymes to catalyse a reaction.
- D. a small organic molecule that forms a complex with an enzyme.

Solution will appear here

Solution

4) The semi-structural formula for an isomer of $C_5H_{13}NO$ is $NH_2CH_2CH_2CH(CH_3)CH_2OH$. The correct systematic name for this molecule is

- A. 4-amino-pentan-1-ol
- B. 4-amino-2-methyl-butan-1-ol
- C. 4-hydroxy-3-methyl-butan-1-amine
- D. 1-hydroxy-2-methyl-4-amino-butane

Solution will appear here

Solution

5) Which one of the following compounds can exist as cis- and trans-isomers?

- A. CH_2CH_2
- B. CH_2CHCH_3
- C. $CH_3CHCHCH_3$
- D. $CH_3(CH_2)_{16}COOH$

Solution will appear here

Solution

6) A meal containing a mixture of carbohydrates, fats and protein is eaten. The biomolecules in this meal are broken down into smaller molecules in the body before they can be absorbed. Which of the following summarises the chemical reactions that would occur prior to the smaller molecules being absorbed by the body?

	Type of reaction	H_2O is a reactant	Possible product
A.	hydrolysis	yes	glycine
B.	condensation	yes	glycogen
C.	hydrolysis	no	glucose
D.	condensation	no	glycerol

Solution will appear here

Solution

7) Tristearin, a triglyceride, is the primary fat found in beef and it contains stearic acid as the only fatty acid. 10.0 g of a pure sample of tristearin is completely broken down into its component molecules – glycerol and stearic acid.

$M(\text{tristearin}) = 890.0 \text{ g/mol}$

$M(\text{glycerol}) = 92.0 \text{ g/mol}$

This reaction would

- A. produce 3.10 g of glycerol.
- B. require 0.836 L of hydrogen gas.
- C. require 0.0112 mol of water molecules.
- D. produce 2.03×10^{22} molecules of stearic acid.

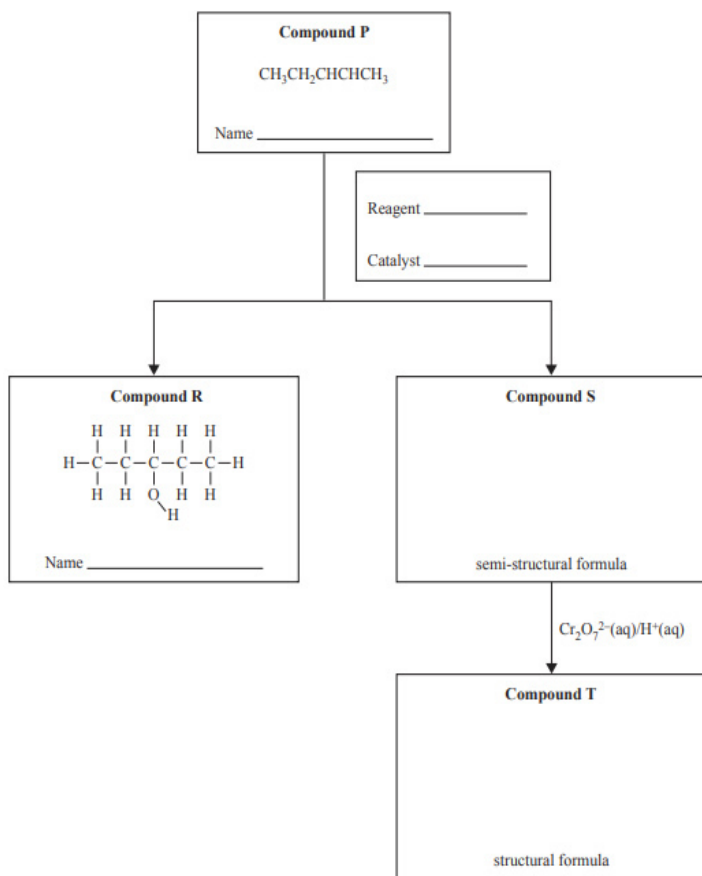
Solution will appear here

Solution

8) Alkenes can be used to manufacture a range of products. The reaction pathway diagram below represents one example of the use of

an alkene. In this reaction pathway, Compound P is used to produce Compound R and Compound S. Compound S can then be used to produce Compound T. Complete the following in the appropriate boxes in the reaction pathway diagram provided.

- Give the IUPAC systematic names for Compound P and Compound R.
- Write the formulas of the reagent and the catalyst required to produce Compound R and Compound S from Compound P.
- Write the semi-structural formula of Compound S.
- Draw the structural formula of Compound T

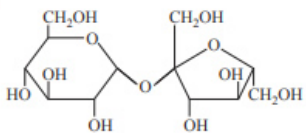
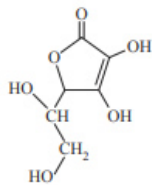
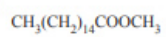
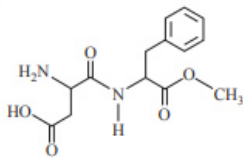
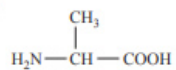
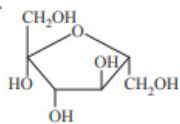
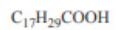


[Solution](#)

9) The structures or formulas of a number of important biomolecules are shown on the left. For each of the following characteristics of biomolecules, write the letter or letters in the space provided for the corresponding biomolecule or biomolecules shown on the left. Each biomolecule may be used more than once or may not be used at all.

Characteristic	Biomolecule letter(s) (A.–H.)
contains a glycosidic linkage	
is an essential dietary component (give letters for two examples)	
is soluble in water (give letters for two examples)	
is able to form a zwitterion	
contains an ester linkage (give letters for two examples)	
can be a key constituent of biodiesel	
has phenylalanine as a component	

[Solution](#)

A.**B.****C.****D.****E.****F.****G.****H.**