Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Polymers

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

Which polymer is **not** hydrolysed when heated with aqueous alkali?

A Kevlar ⬭

B Nylon 6,6 ⬭

C Poly(propene) ⬭

D Terylene ⬭

(Total 1 mark)

Downloaded from www.merit-minds.com

Q2.

Which polymer has hydrogen bonding between the polymer chains?

A Kevlar ⬭

B PVC ⬭

C poly(phenylethene) ⬭

D Terylene ⬭

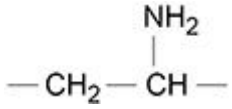
(Total 1 mark)

Downloaded from www.merit-minds.com

Q3.

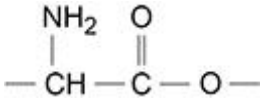
Which is the repeating unit of a polyamide?

A



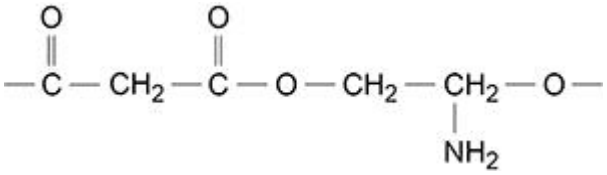
○

B



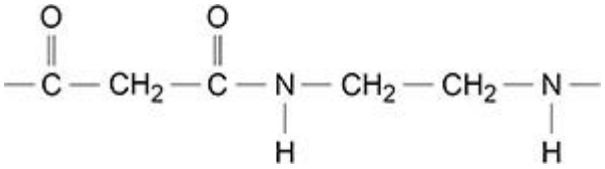
○

C



○

D



○

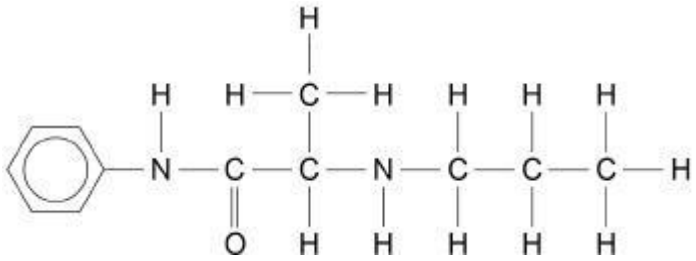
(Total 1 mark)

Downloaded from www.merit-minds.com

Q4.

Prilocaine is used as an anaesthetic in dentistry.
Figure 1 shows the structure of prilocaine.

Figure 1



(a) Draw a circle around any chiral centre(s) in **Figure 1**.

(1)

(b) Identify the functional group(s) in the prilocaine molecule.

Tick (✓) the box(es) corresponding to the functional group(s).

Amide	Amine	Ester	Ketone

(1)

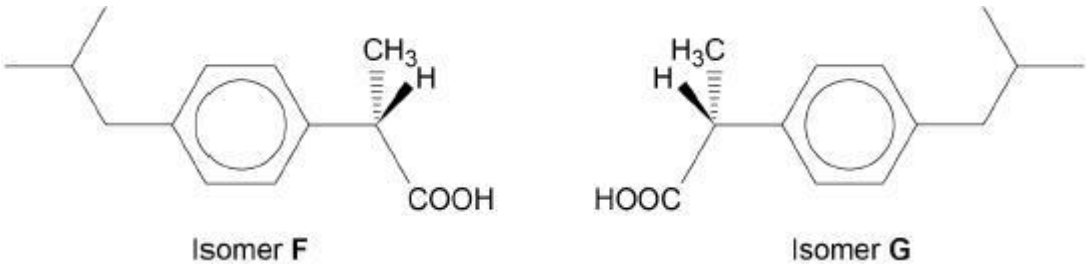
(c) Prilocaine is completely hydrolysed in the human body to give a mixture of products.

Draw the structures of the two organic products formed in the complete hydrolysis of prilocaine in acidic conditions.

(3)

(d) **Figure 2** shows optical isomers **F** and **G**.

Figure 2



Isomer **F** Isomer **G**

Isomer **F** is the active compound in the medicine ibuprofen.

In the manufacture of ibuprofen both isomers **F** and **G** are formed. An enzyme is then used to

Downloaded from www.merit-minds.com

bind to isomer **G** and catalyse its hydrolysis.

After the products of hydrolysis of **G** are removed, a pure sample of isomer **F** is collected.

Explain how a structural feature of this enzyme enables it to catalyse the hydrolysis of isomer **G** but not the hydrolysis of isomer **F**.

_____

_____

_____

_____

(2)

(Total 7 marks)

Downloaded from www.merit-minds.com

Q5.

Which type of polymer is **not** hydrolysed by heating with concentrated aqueous sodium hydroxide?

A poly(alkene) ⬭

B poly(amide) ⬭

C poly(ester) ⬭

D protein ⬭

(Total 1 mark)

Downloaded from www.merit-minds.com

Q6.

Which forms a polymer with $ClOC(CH_2)_8COCl$?

A $NH_2CH_2CH_2NH_2$ ⬭

B $(CH_3CO)_2O$ ⬭

C $CH_3CH_2CONH_2$ ⬭

D NH_2CH_2COOH ⬭

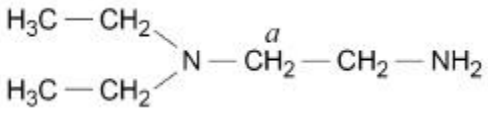
(Total 1 mark)

Downloaded from www.merit-minds.com

Q7.

There are several isomers with the molecular formula $C_6H_{16}N_2$

(a) One isomer is shown.



Give the number of peaks in the ^{13}C NMR spectrum of this isomer.

State and explain the splitting pattern of the peak for the hydrogens labelled *a* in its ^{1}H NMR spectrum.

Number of ^{13}C peaks _____

Splitting pattern _____

Explanation _____

_____

_____

_____

(3)

(b) Draw the structure of the isomer of $C_6H_{16}N_2$ used to make nylon 6,6

(1)

(c) Draw the structure of the isomer of $C_6H_{16}N_2$ that contains two **primary** amine groups and has only two peaks in its ^{13}C NMR spectrum.

Downloaded from www.merit-minds.com

(1)

(d) Draw the structure of the isomer of $C_6H_{16}N_2$ that contains two **tertiary** amine groups and has only two peaks in its ^{13}C NMR spectrum.

(1)

(Total 6 marks)

Downloaded from www.merit-minds.com