8.2 Transport of Oxygen & Carbon Dioxide

Question Paper

Course	CIE A Level Biology (9700) exams from 2022
Section	8. Transport in Mammals
Topic	8.2 Transport of Oxygen & Carbon Dioxide
Difficulty	Easy

Time allowed: **10**

Score: **/10**

Percentage: **/100**

Question 1

As blood passes through the capillaries of the lungs the uptake of oxygen is maximised.

Which of the statements below explain how this happens?

A The dissociation of carbon dioxide from carboxyhaemoglobin allows more haemoglobin to be available for oxygen binding.

B The binding of the first oxygen molecule to haemoglobin decreases the affinity of the molecule for binding other oxygen molecules.

C Oxyhaemoglobin formation increases the capacity of red blood cells to transport oxygen.

D Each haemoglobin molecule can temporarily bind to four oxygen atoms.

[1 mark]

Question 2

Carbonic anhydrase catalyses a reaction involved in the transport of carbon dioxide.

What happens after this reaction has taken place?

A The formation of carbon dioxide from carbonic acid

B The formation of oxyhaemoglobin from haemoglobin and oxygen

C The dissociation of oxyhaemoglobin to haemoglobin and oxygen

D The formation of carbaminohaemoglobin to haemoglobin and oxygen

[1 mark]

Question 3

Which of the following is a correct statement about the transport of carbon dioxide by blood?

1 Carbon dioxide dissociates forming hydrogen ions that combine with haemoglobin to form carbaminoglobin.

2 Carbon dioxide diffuses from respiring cells to red blood cells and reacts with water.

3 The enzyme carbonic anhydrase catalyses the formation of carbonic acid in red blood cells.

A 1, 2 and 3 **B** 1 and 3 **C** 1 and 2 **D** 2 and 3

[1 mark]

Question 4

Which of the following could be a result of lower concentrations of carbonic anhydrase?

A Less oxygen is released from oxyhaemoglobin in respiring tissue.

B The pH of the blood will be lowered.

C Carbaminohaemoglobin concentrations will decrease.

D The rate of dissociation of carbonic acid is increased.

[1 mark]

Question 5

Which of the following reactions will take place in the blood of a capillary next to an alveolus in the lungs?

1 $H_2O + CO_2 \rightarrow H_2CO_3$

2 $Hb + 4O_2 \rightarrow HbO_8$

3 $HHb + 4O_2 \rightarrow HbO_8 + H^+$

A 1 only **B** 2 only **C** 1 and 2 **D** 2 and 3

[1 mark]

Question 6

Which of the following can be carried out by a mature red blood cell?

A protein synthesis

B cell division

C phagocytosis

D active transport

[1 mark]

Question 7

Haemoglobin can bind to carbon dioxide, oxygen and carbon monoxide.

Which of the following statements about the binding sites on a haemoglobin molecule is correct?

A Carbon dioxide and carbon monoxide bind to one site, oxygen binds to a different site.

B Carbon monoxide and oxygen bind to one site, carbon dioxide binds to a different site.

C Carbon dioxide and oxygen bind to one site, carbon monoxide binds to a different site.

D Carbon dioxide, carbon monoxide and oxygen all bind to different sites.

[1 mark]

Question 8

The properties of haemoglobin change as a result of the Bohr effect.

Which row of the table below correctly describes these changes?

	affinity for oxygen by haemoglobin	oxygen dissociates from haemoglobin
A	lower	less readily
B	lower	more readily
C	higher	less readily
D	higher	more readily

[1 mark]

Question 9

Carbonic anhydrase is an enzyme.

What is produced as a result of the action of carbonic anhydrase?

A oxyhaemoglobin

B carbaminohaemoglobin

C haemoglobinic acid

D hydrogen carbonate ions

[1 mark]

Question 10

The Bohr effect describes a relationship between haemoglobin, oxygen and carbon dioxide.

Which statement best describes this effect?

A In low partial pressure of oxygen and high partial pressure of carbon dioxide, the affinity of haemoglobin for oxygen decreases.

B In high partial pressure of oxygen and high partial pressure of carbon dioxide, the affinity of haemoglobin for oxygen increases.

C In low partial pressure of oxygen and low partial pressure of carbon dioxide, the affinity of haemoglobin for oxygen is unchanged.

D In high partial pressure of oxygen and low partial pressure of carbon dioxide, the affinity of haemoglobin for oxygen decreases.

[1 mark]