

Cambridge  
International  
AS & A Level

**Cambridge International Examinations**  
Cambridge International Advanced Subsidiary and Advanced Level

CANDIDATE  
NAME

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**BIOLOGY**

**9700/23**

Paper 2 AS Level Structured Questions

**October/November 2016**

**1 hour 15 minutes**

Candidates answer on the Question Paper.

No Additional Materials are required.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

**DO NOT WRITE IN ANY BARCODES.**

Answer **all** questions.

Electronic calculators may be used.

You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **14** printed pages and **2** blank pages.



(c) State two components of a cell surface membrane **other than** phospholipid molecules and describe their function.

*component 1* .....

*function* .....

.....

.....

*component 2* .....

*function* .....

.....

..... [4]

[Total: 11]





(iv) Suggest why there are few drugs that have any effect on viruses.

.....  
.....  
.....  
.....  
.....[2]

(c) The search for new antibiotics is important because there are many strains of bacteria that are resistant to antibiotics.

Suggest two ways to reduce the spread of antibiotic resistance.

1 .....  
.....  
2 .....  
.....[2]

[Total: 14]

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3 Fig. 3.1 shows part of a transverse section of a root of *Ranunculus repens*.

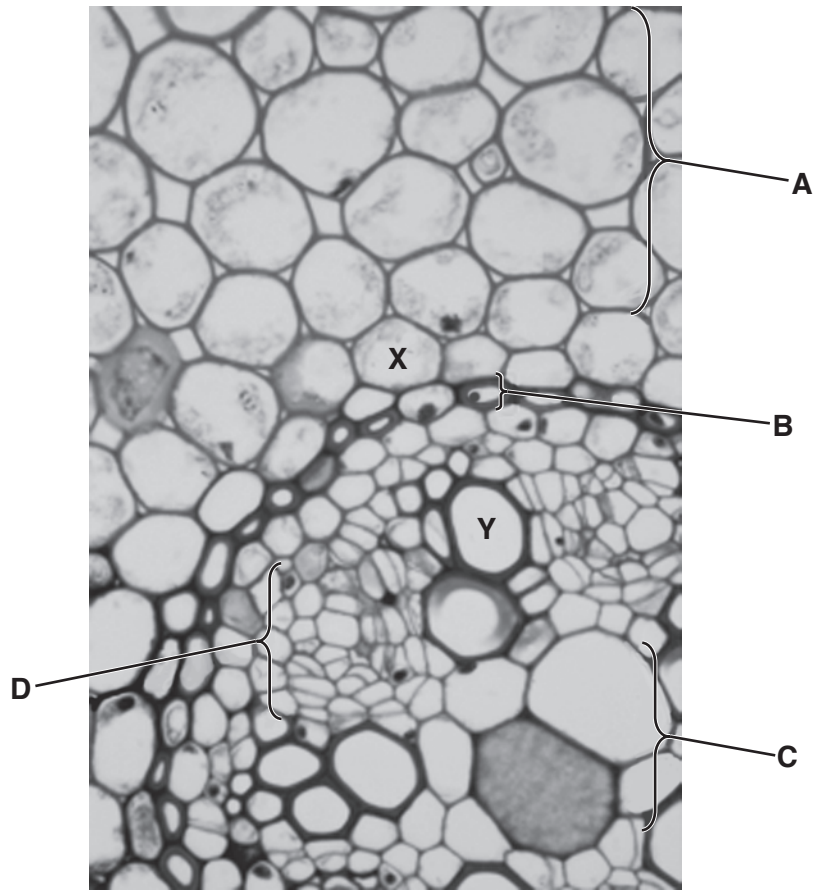


Fig. 3.1

(a) Name tissues A to D.

- A .....
- B .....
- C .....
- D ..... [4]



4 Protein synthesis requires ribosomes, mRNA, tRNA, amino acids and enzymes.

Fig. 4.1 is a diagram of a molecule of tRNA.

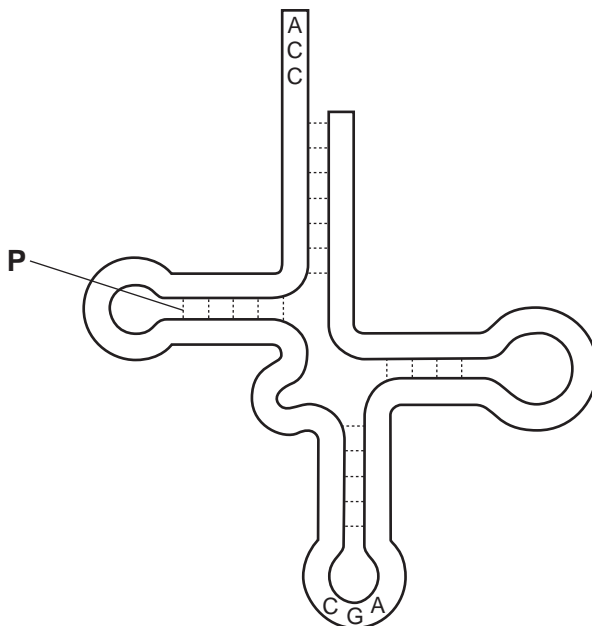


Fig. 4.1

(a) Name the bond labelled P.

.....[1]

(b) Use Fig. 4.1 to describe the role of tRNA in protein synthesis.

You may annotate Fig. 4.1 to help your answer.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....[3]



5 In an investigation, the volume of oxygen that combined with haemoglobin at different partial pressures of oxygen was determined. The results are shown in Fig. 5.1.

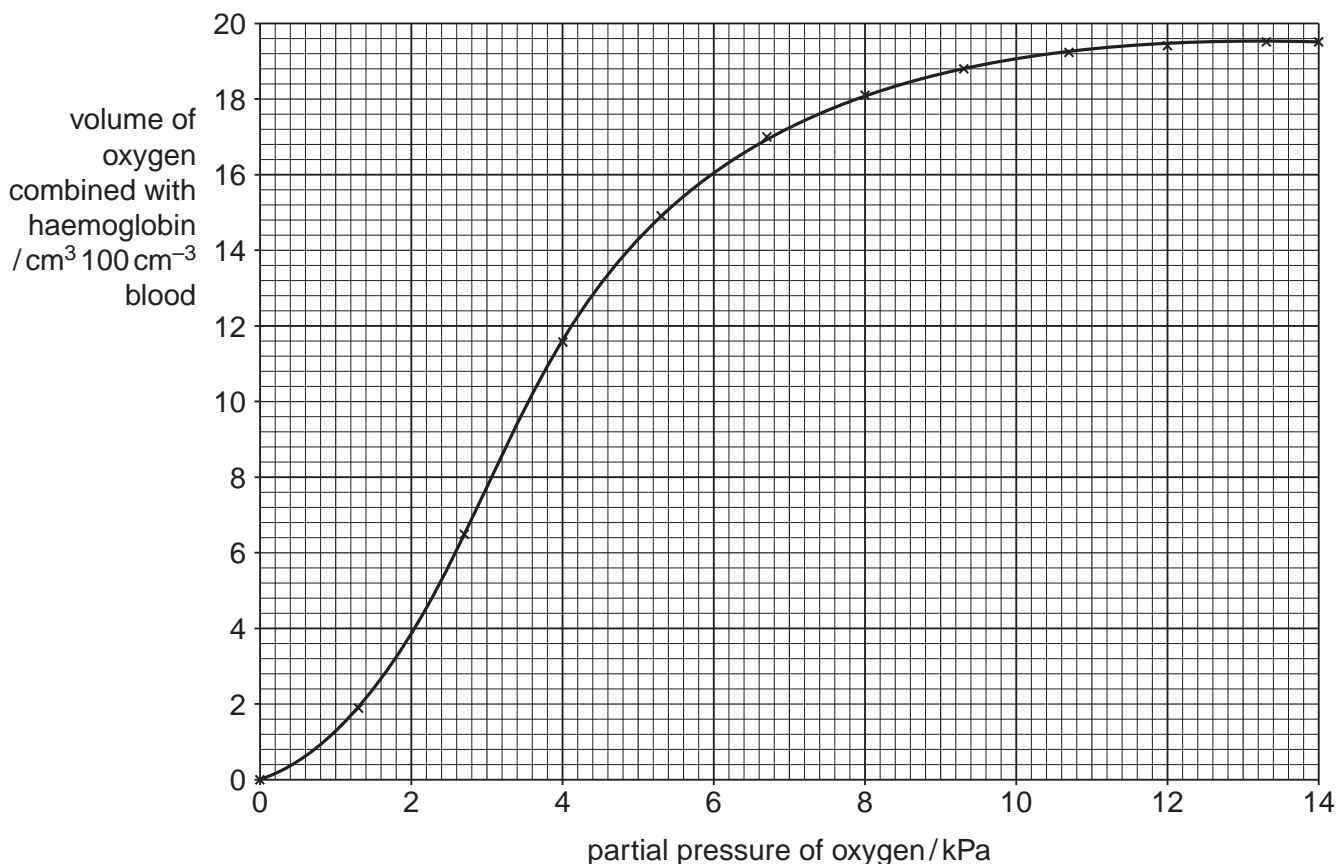


Fig. 5.1

(a) The partial pressure of oxygen in the alveoli is 13.3 kPa. At this partial pressure of oxygen the **total volume of oxygen** that is carried by 100 cm<sup>3</sup> blood is 19.78 cm<sup>3</sup> at pH 7.4 and 37 °C.

The volume of oxygen that combines with haemoglobin at 13.3 kPa is 19.48 cm<sup>3</sup> 100 cm<sup>-3</sup> blood.

(i) Calculate the percentage of oxygen that is combined with haemoglobin in 100 cm<sup>3</sup> blood.

answer .....% [1]

(ii) Suggest how the oxygen that is **not** combined with haemoglobin is transported in the blood.

.....  
 ..... [1]

(iii) Explain why a long-term smoker would have a lower volume of oxygen combined with haemoglobin in the alveoli at 13.3 kPa.

.....  
.....  
.....  
.....  
..... [2]

(b) Describe the role of carbonic anhydrase in the transport of carbon dioxide.

.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

(c) The investigation was repeated in the presence of carbon dioxide. The volumes of oxygen combined with haemoglobin at partial pressures of oxygen below 8.0 kPa were less than shown in Fig. 5.1.

Name this effect **and** explain the advantage of this decrease at partial pressures of oxygen below 8.0 kPa.

*name* .....

*advantage* .....

.....  
.....  
.....  
.....  
.....  
..... [3]

[Total: 10]

6 Measles is a highly infectious disease.

(a) Name the pathogen that causes measles.

.....[1]

The number of cases of measles is reported to the World Health Organization (WHO) by countries throughout the world so that global data are collected.

Fig. 6.1 shows the global data collected between January 2008 and December 2012.

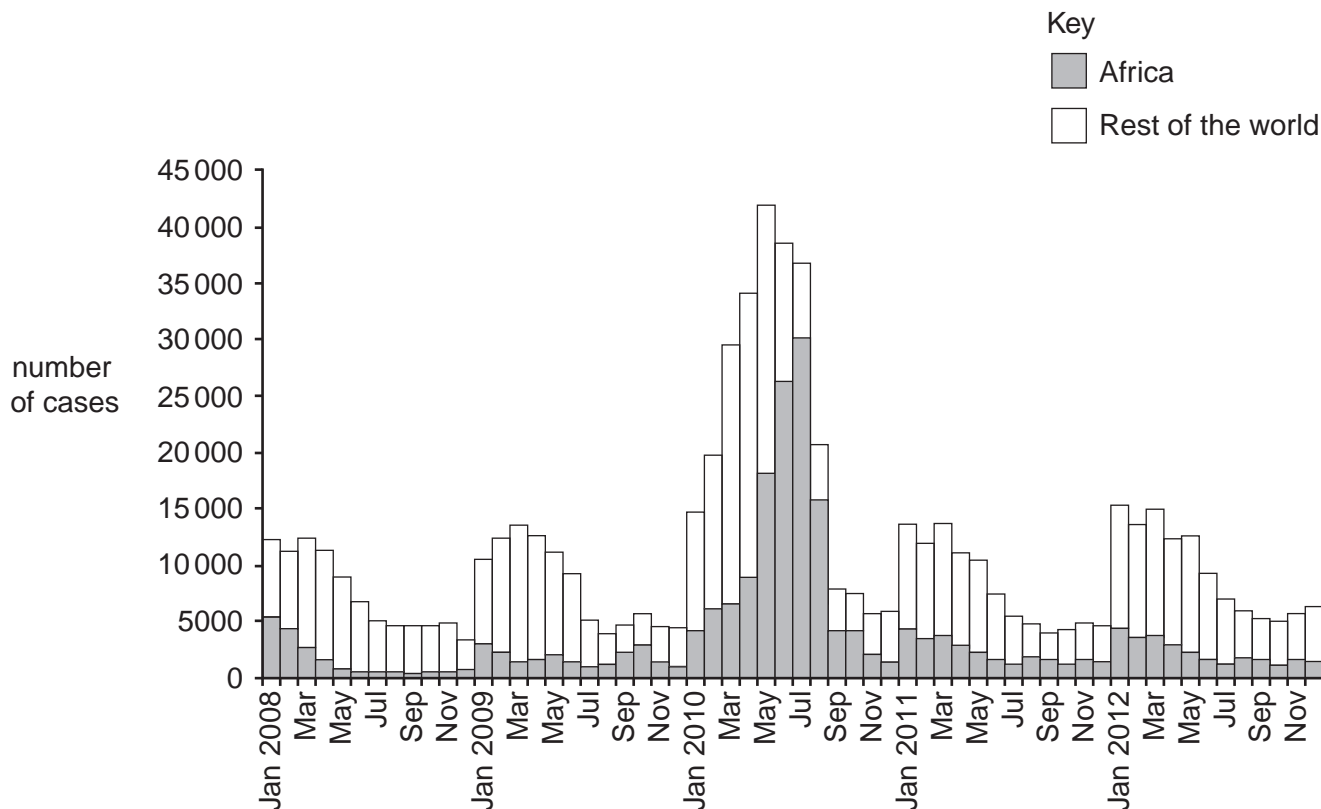


Fig. 6.1

(b) Use the data in Fig. 6.1 to describe the pattern shown in the number of cases of measles reported to the WHO between January 2008 and December 2012.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....[3]



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