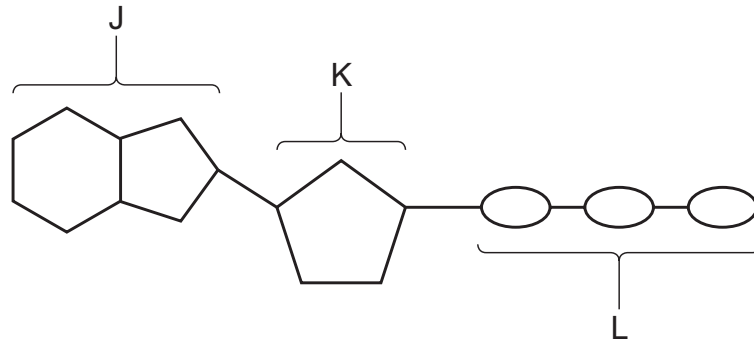


24 The diagram represents a molecule of ATP.



What are the components of ATP labelled J, K and L?

	J	K	L
A	adenine	deoxyribose	phosphates
B	adenosine	pentose	a phosphate group
C	adenosine	ribose	phosphorus
D	purine	pentose	phosphates

- 4 (a) Fig. 4.1 shows a phosphorylated nucleotide which is one of the monomers that is used to synthesise DNA during replication.

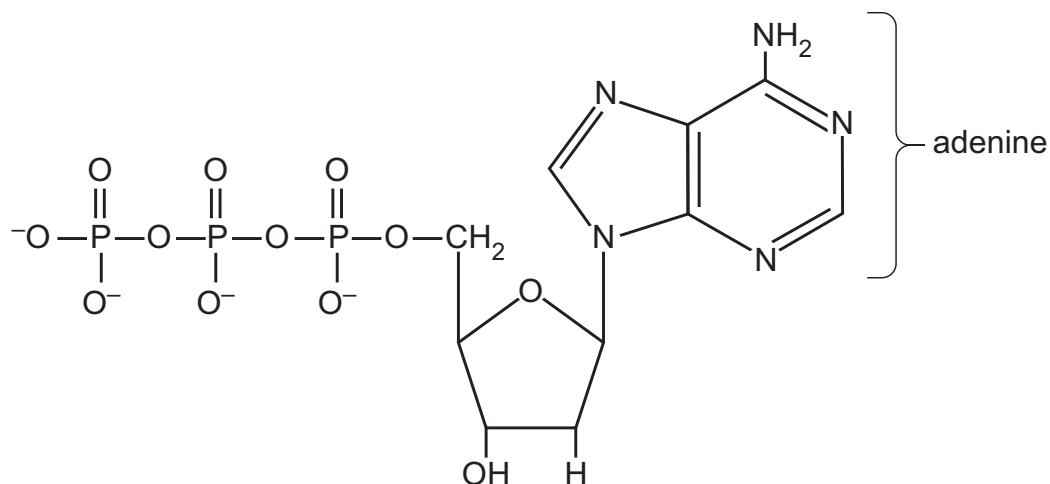


Fig. 4.1

- (i) State the meaning of monomers of DNA.

..... [1]

- (ii) State how ATP differs in structure from the phosphorylated nucleotide shown in Fig. 4.1.

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

- (iii) State the process occurring in all cells that results in the production of ATP.

..... [1]

- (b) Fig. 4.2 shows a short length of a DNA molecule. One of the strands of the DNA molecule is labelled **Y**.

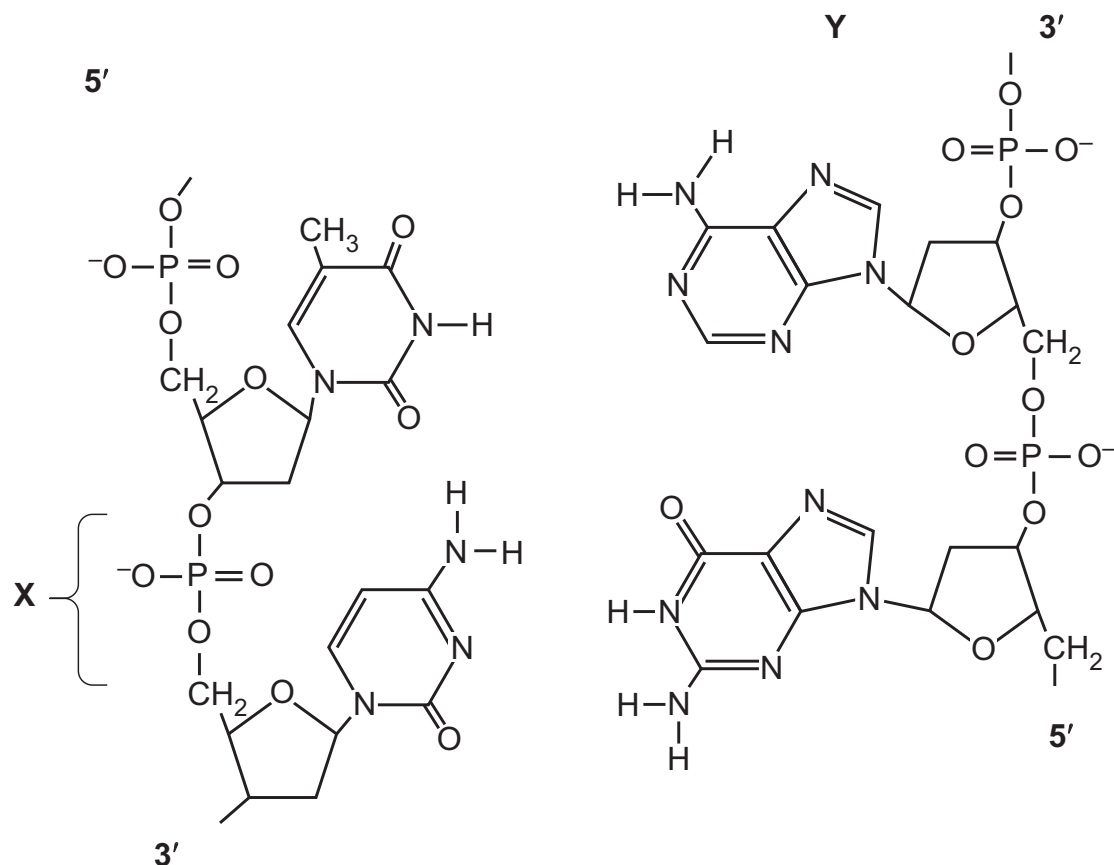


Fig. 4.2

- (i) Complete Fig. 4.2 by drawing dotted lines to represent all the hydrogen bonds between the two strands of the DNA molecule. [2]
- (ii) State the name of the bond **X**. [1]

..... [1]

[Total: 6]

- 1 Rice, *Oryza sativa*, is a crop plant that has adapted to grow in flooded fields.

Fig. 1.1 outlines the effects on rice plants of growing in flooded fields.

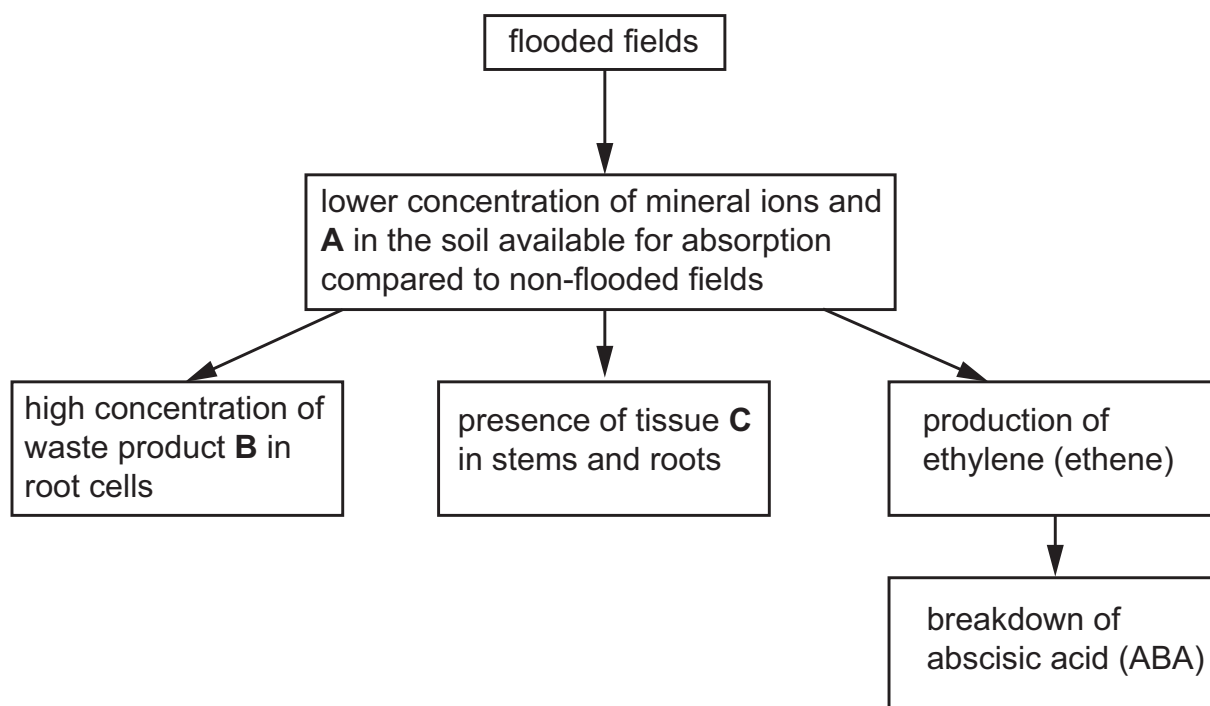


Fig. 1.1

- (a) With reference to Fig. 1.1, name:

substance **A**

substance **B**

tissue **C**

[3]

- (b) Describe how root cells respond to a high concentration of substance **B**.

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

(c) Gibberellin is involved in the growth of stems in rice plants.

Fig. 1.2 shows the effect of gibberellin concentration on the length of stems in rice plants.

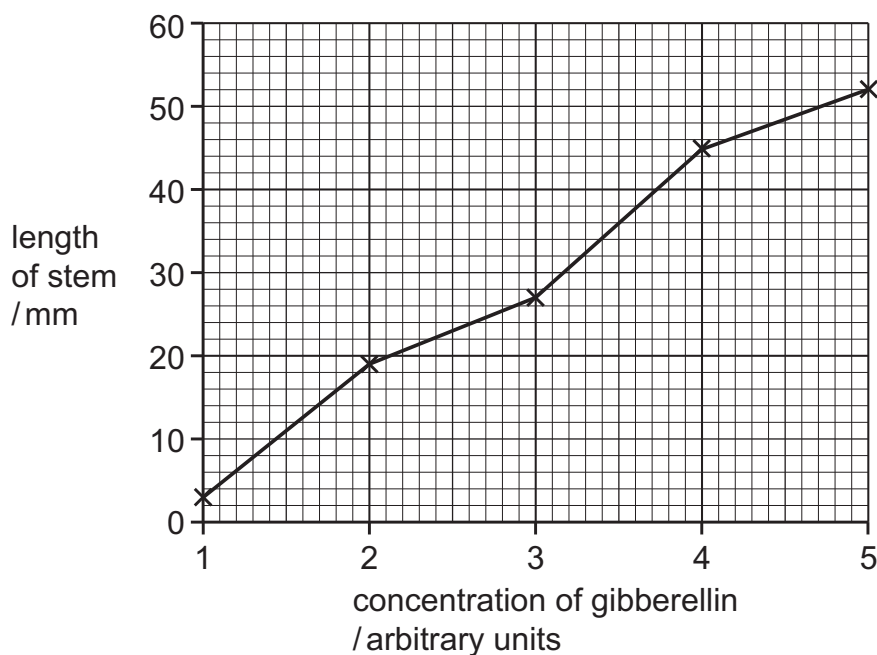


Fig. 1.2

(i) Describe the relationship shown in Fig. 1.2.

.....

.....

.....

.....

..... [2]

(ii) ABA in rice plant cells inhibits the action of gibberellin.

With reference to Fig. 1.1 and Fig. 1.2, explain the importance of ethylene production for the growth of rice plants in flooded fields.

.....

.....

.....

.....

..... [3]

7 In aerobic respiration, most ATP is produced by oxidative phosphorylation.

(a) Outline the features of ATP that make it suitable as the universal energy currency.

[3]

(b) Rotenone is a compound that affects oxidative phosphorylation.

Rotenone disrupts the first carrier in the electron transport chain by stopping the transfer of electrons from this carrier.

Suggest **and** explain how rotenone reduces the production of ATP **and** water in aerobic respiration.

[6]

[Total: 9]

- 9 (a) In aerobic conditions, pyruvate that has formed during glycolysis enters the mitochondrion and takes part in the link reaction.

Name the **two** coenzymes involved in the link reaction.

.....

.....

[2]

- (b) Enzymes play an important role in the functioning of the Krebs cycle.

The enzymes in the Krebs cycle can be affected by the presence of hydrogen peroxide. Hydrogen peroxide is a product of some of the reactions that occur within the mitochondrion.

An investigation was carried out to measure the effect of two different concentrations of hydrogen peroxide on an enzyme of the Krebs cycle. The activity of the enzyme was measured over 10 minutes when exposed to the two different concentrations of hydrogen peroxide.

The results are shown in Fig. 9.1.

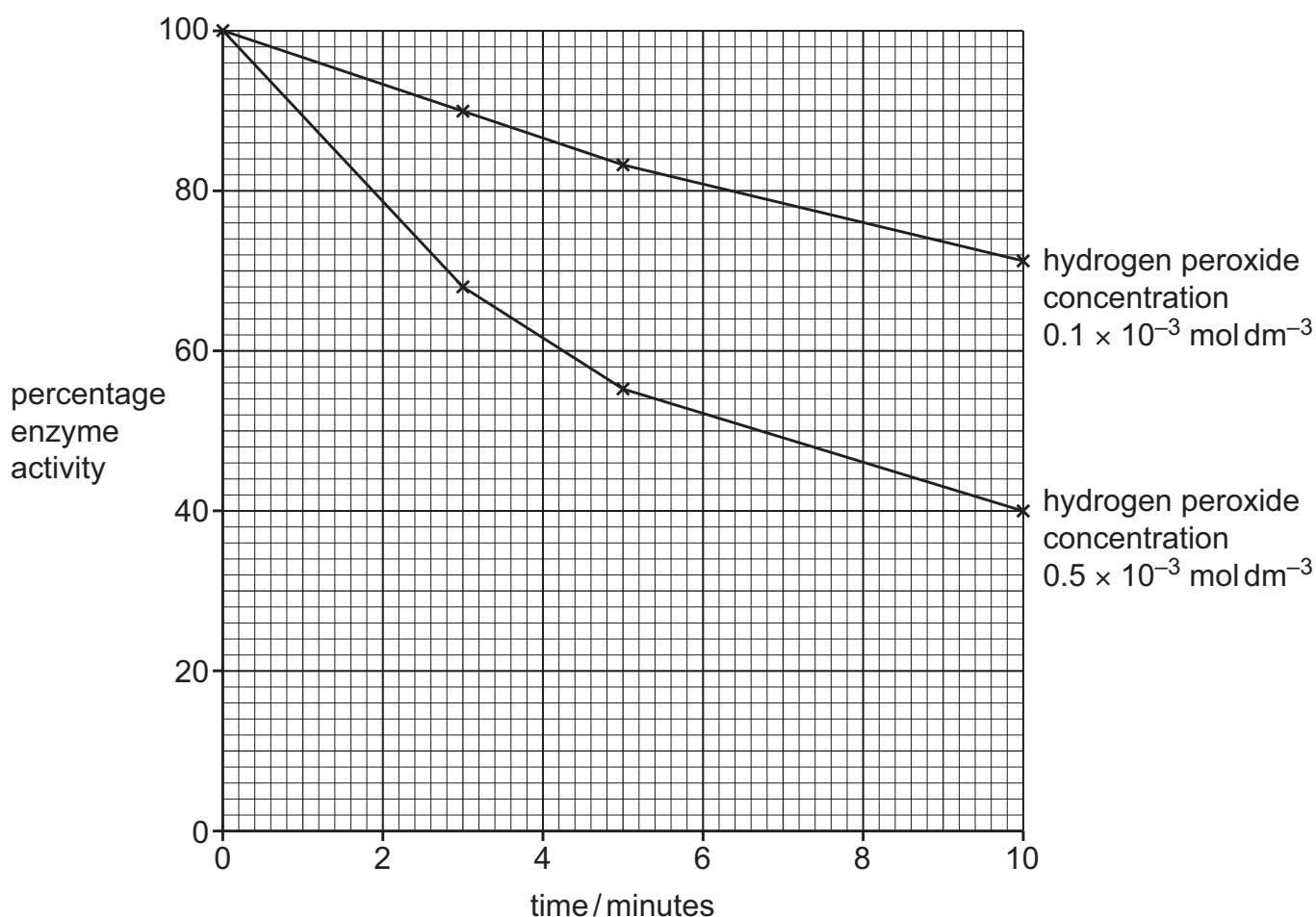


Fig. 9.1

Describe the effect shown in Fig. 9.1 of hydrogen peroxide concentration on the activity of the Krebs cycle enzyme.

[3]

- (c)** Reduced NAD and reduced FAD are produced during the Krebs cycle. They carry hydrogen to the inner mitochondrial membrane where oxidative phosphorylation occurs.

The first two steps in oxidative phosphorylation are:

1. Hydrogen atoms split into protons and electrons.
2. Electrons move along the electron transport chain, releasing energy.

Outline the steps that occur to complete oxidative phosphorylation.

[4]

- (d) Fig. 9.2 shows the oxygen consumption of a person who is carrying out a fast-running exercise.

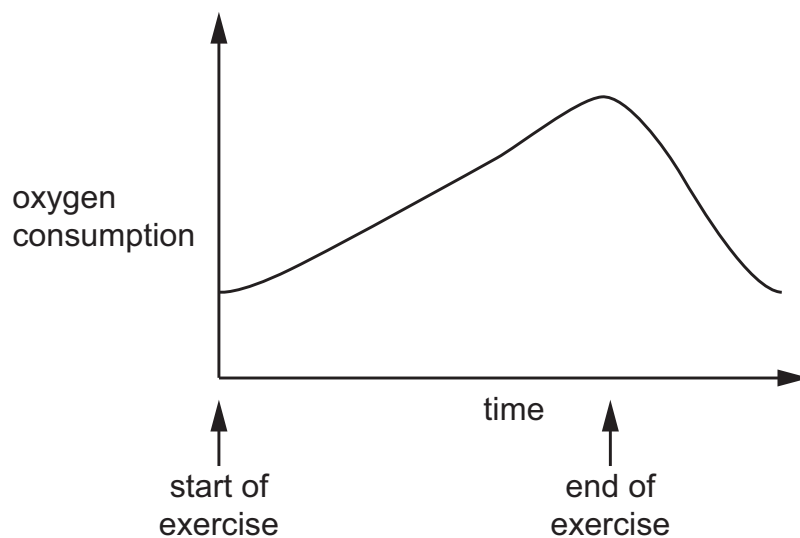


Fig. 9.2

Suggest why the oxygen consumption takes time to return to normal after exercise.

.....

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.....

.....

.....

.....

..... [3]

[Total: 12]