



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

CANDIDATE  
NAME

CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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**BIOLOGY**

**5090/02**

Paper 2 Theory

**October/November 2008**

**1 hour 45 minutes**

Candidates answer Section A on the Question Paper.

Additional Materials: Answer Booklet/Paper

**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 a pencil for any diagrams, graphs or rough working.  
Do not use staples, paper clips, highlighters, glue or correction fluid.  
**DO NOT WRITE IN ANY BARCODES.**

**Section A**

Answer **all** questions.

Write your answers in the spaces provided on the Question Paper.

**Section B**

Answer **all** the questions including questions 6, 7 and 8 **Either** or 8 **Or**.

Write your answers on the separate Answer Paper provided.

Write an **E** (for Either) or an **O** (for Or) next to the number 8 in the Examiner's grid below to indicate which question you have answered.

You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.

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.

For Examiner's Use	
Section A	
Section B	
6	
7	
8	
<b>Total</b>	

This document consists of **12** printed pages.



Section A

Answer **all** the questions in this section.

Write your answers in the spaces provided.

- 1 Fig. 1.1 shows a seed before germination and Fig. 1.2 shows the same seed after it has become a seedling.

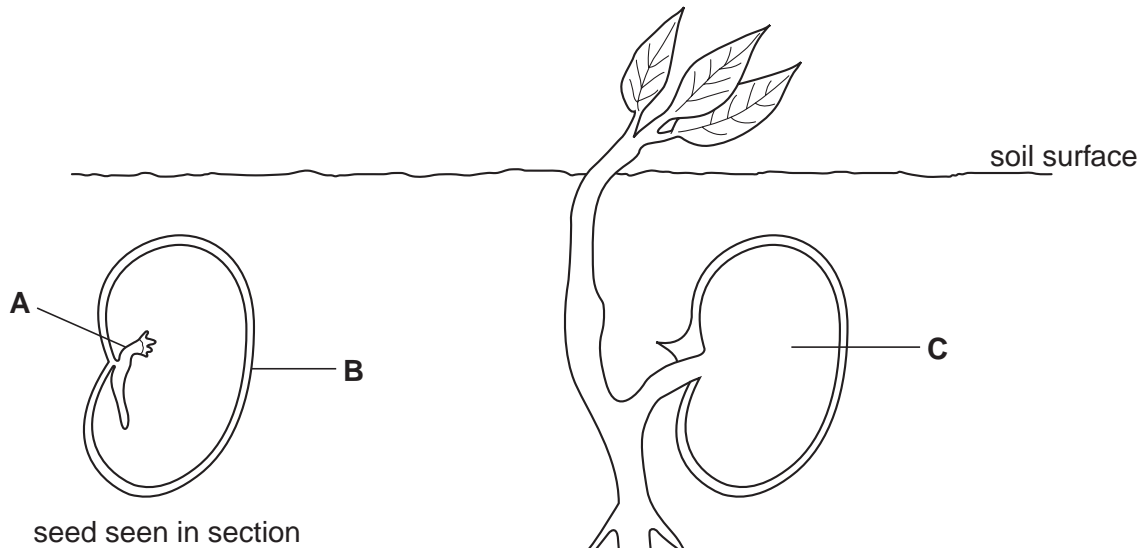


Fig. 1.1

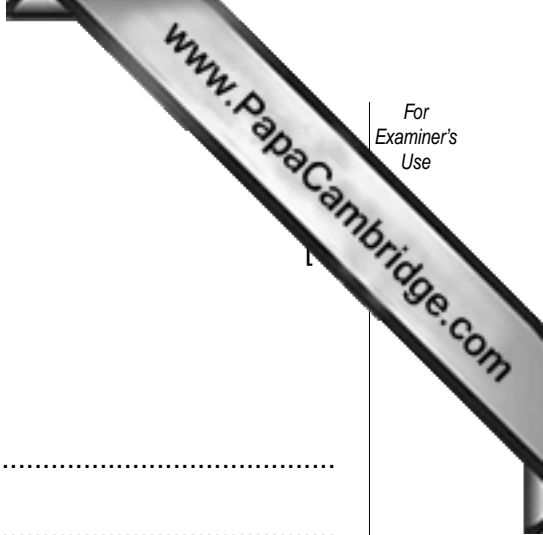
Fig. 1.2

- (a) Identify structures **A** and **B**.

**A** .....

**B** .....

[2]



(b) (i) Suggest a food likely to be stored at **C**.

.....

Explain how this food

(ii) is made available for the process of germination,

.....  
.....  
.....

(iii) travels to **D** in Fig. 1.2,

.....  
.....

(iv) is used at **D**.

.....  
.....

[5]

(c) On Fig. 1.2, use labelled arrows to show where a **named** gas enters and leaves the seedling during daylight hours. [2]

[Total: 10]

- 2 Fig. 2.1 shows the liver receiving chemicals from and sending chemicals to some organs.

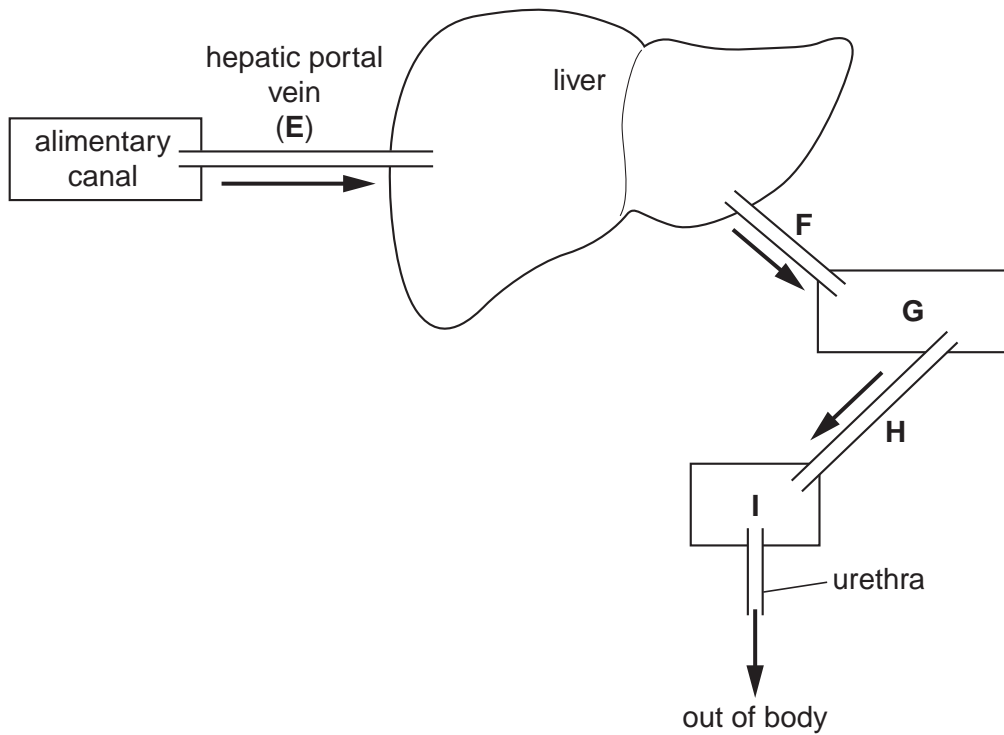


Fig. 2.1

- (a) Identify organs **G** and **I**.

**G** .....

**I** .....

[2]

- (b) Name the carbohydrate travelling in the hepatic portal vein (**E**), and explain how, on arrival in the liver, it is converted into a storage compound.

named carbohydrate .....

explanation .....

..... [4]

- (c) Describe how the composition of the contents of **F** and **H** differ in a healthy person.

.....

.....

.....

..... [4]

[Total: 10]

- 3 Fig. 3.1 shows a section through a leaf.

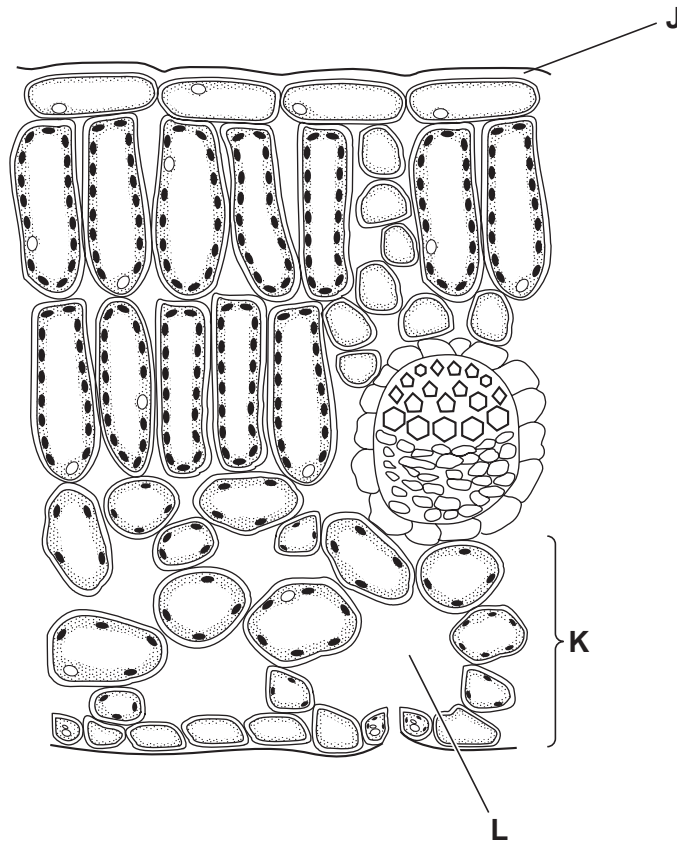


Fig. 3.1

- (a) Identify structures J and K.

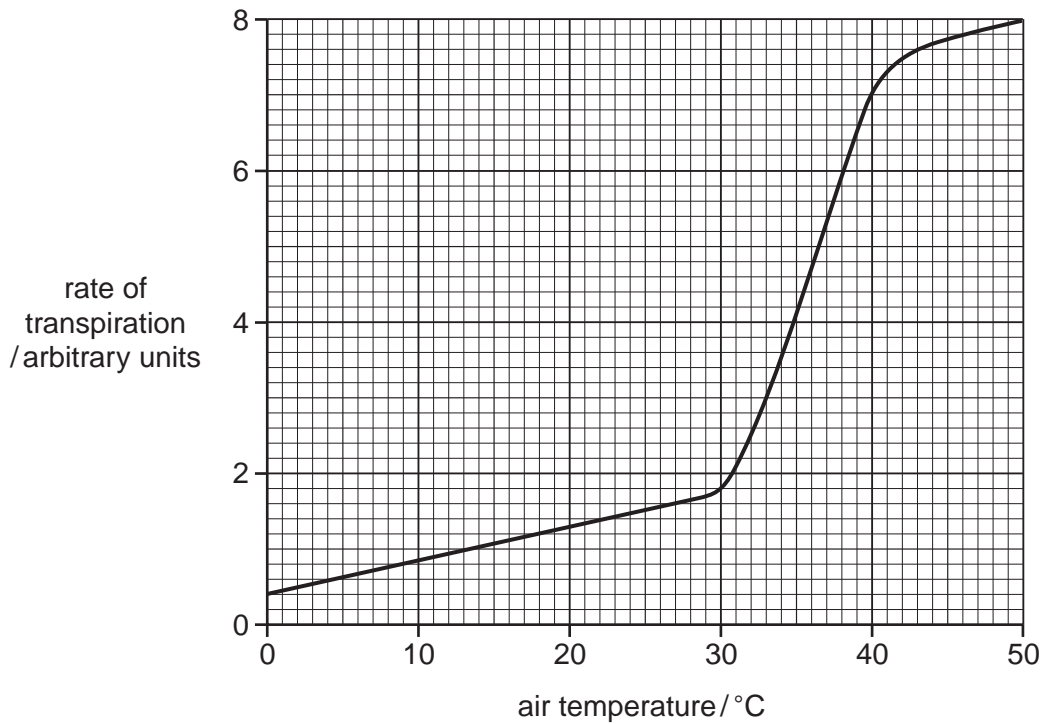
J .....

K .....

[2]

- (b) (i) On Fig. 3.1, use arrows to show the pathway taken by water from its arrival in this part of the leaf until it is lost into the atmosphere. [3]
- (ii) Place a large X so that its arms cross as closely as possible to the point at which evaporation of water is occurring. [1]

Fig. 3.2a shows the rates of transpiration for a particular species of plant at different temperatures.



**Fig. 3.2a**

Fig. 3.2b shows the air temperatures and the temperatures inside the leaf at point L in Fig. 3.1 for the same plant during 24 hours.

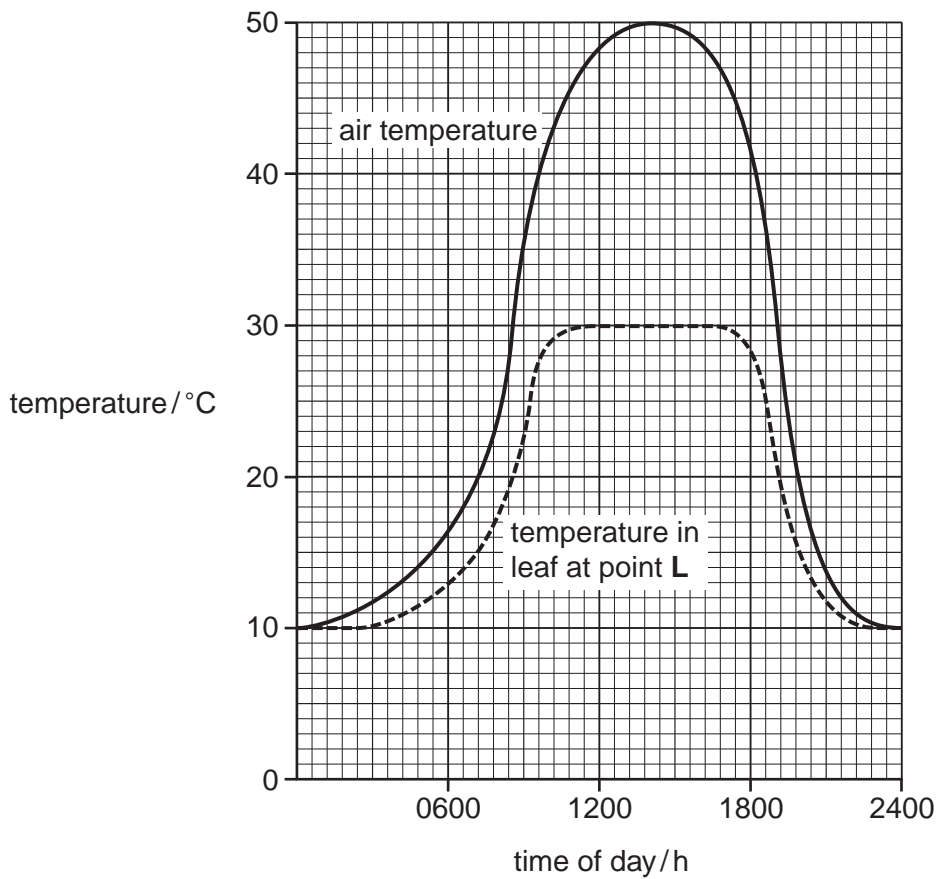
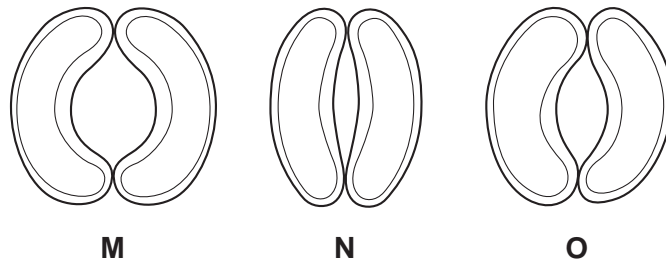


Fig. 3.2c shows stomata as they appear in this leaf at three different times during the



**Fig. 3.2c**

**(c)** Using information provided in Fig. 3.2a and Fig. 3.2b, state which of the stomatal pores, **M**, **N** and **O**, in Fig. 3.2c, shows their appearance at the following times of day.

**(i)** 03:00 .....

**(ii)** 19:30 .....

[2]

**(d)** Suggest why the temperature inside the leaf never rises above 30°C, even though the air temperature rises much higher than this.

.....

.....

..... [2]

[Total: 10]

4 Fig. 4.1 shows human blood containing pathogenic (disease-causing) organisms.

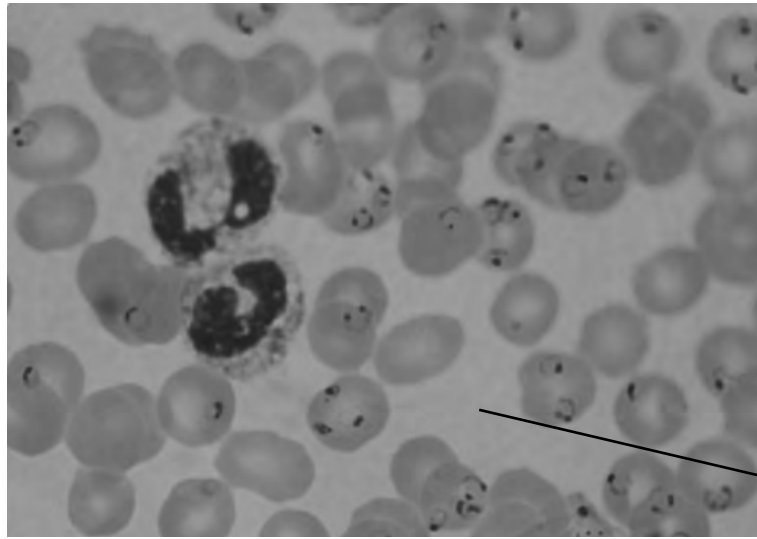


Fig. 4.1

(a) (i) Name the liquid labelled **Q** in Fig. 4.1. .... [1]

(ii) Name two mineral ions which may be found in liquid **Q** and, for each ion, state its function in the body.

ion 1 ..... function .....

ion 2 ..... function .....

[3]

(b) On Fig. 4.1, label

(i) a white blood cell,

(ii) a red blood cell infected with the pathogenic organism.

[2]

(c) The pathogenic organisms were introduced into the blood by a mosquito while feeding. Suggest why the mosquito feeds from a capillary and not from an artery.

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

[Total: 9]



5 Fig. 5.1 shows changes in the uterus during the menstrual cycle.

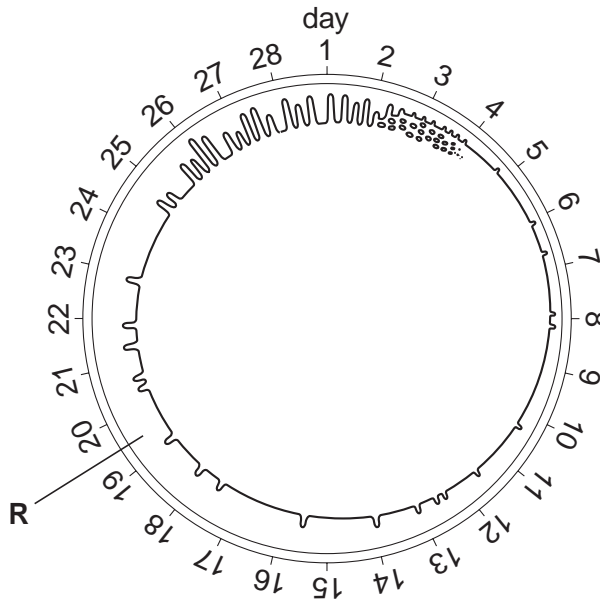


Fig. 5.1

(a) Identify R. .... [1]

(b) State the days when each of the following processes are most likely to occur during the cycle.

(i) fertilisation .....

(ii) implantation .....

[2]

(c) Suggest and explain why blood must not pass directly from the mother to the fetus during pregnancy, even though it contains substances necessary for fetal development.

.....

.....

.....

..... [3]

Table 5.1 shows that temperature determines whether the eggs of a particular species of reptile hatch into a male or a female.

**Table 5.1**

	temperature/°C									
	29	30	31	32	33	34	35	36	37	38
<b>% of females hatching</b>	100	100	99	50	1	0	50	99	100	100
<b>% males hatching</b>	0	0	1	50	99	100	50	1	0	0

**(d) (i)** State the ranges of temperatures at which females are more likely than males to hatch from the eggs.

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

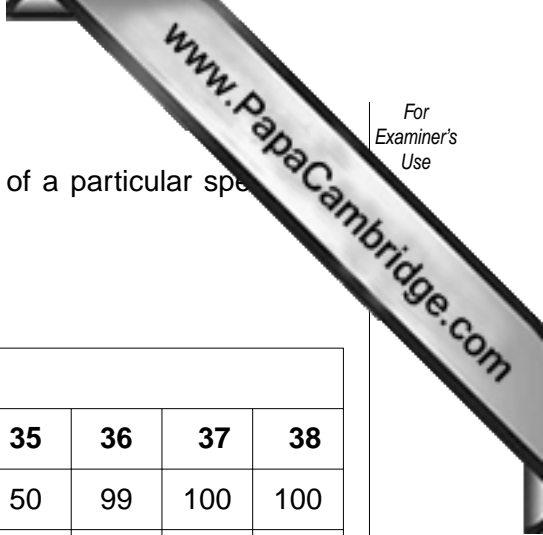
**(ii)** State three ways in which the production of a **male** human child differs from the production of the **male** form of this reptile.

1. ....

2. ....

3. .... [3]

[Total: 11]



## Section B

Answer **all** the questions including questions 6, 7 and 8 **Either** or 8 **Or**.

Write your answers on the separate answer paper provided.

- 6 (a) Fig. 6.1 shows the flow of energy through a part of the carbon cycle.

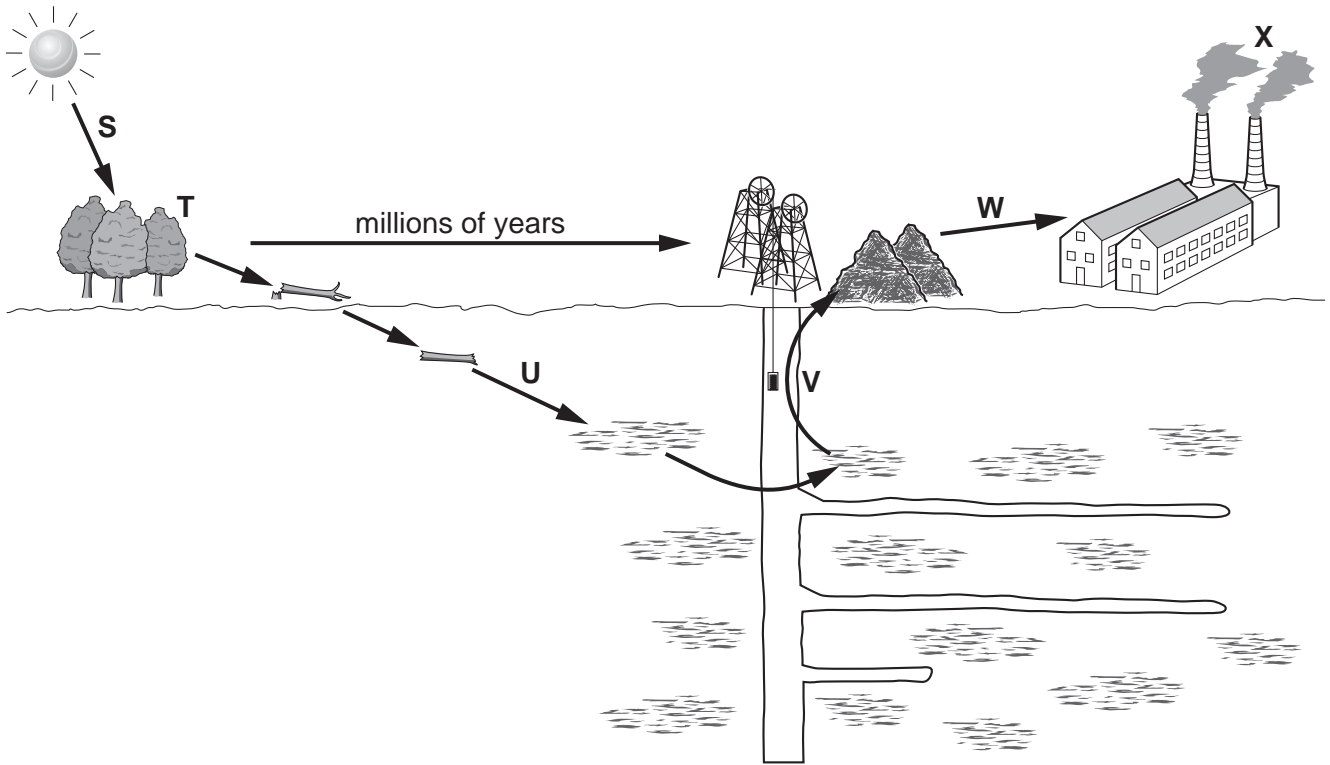


Fig. 6.1

Describe how energy flows through this part of the cycle by referring to what happens at each of the points **S** to **X**. [7]

- (b) Describe the harm to the environment caused by human involvement in the cycle at **V**, **W** and **X**. [3]

[Total: 10]

7 (a) What is meant by the terms

(i) *discontinuous variation*,

(ii) *continuous variation*?

Describe **one** example of each type.

[7]

(b) State the causes of

(i) sickle cell anaemia,

(ii) Down's syndrome.

[3]

[Total: 10]

Question 8 is in the form of an **Either/Or** question. Answer only question 8 **Either** or question 8 **Or**.

8 **Either** (a) Define *respiration*.

[3]

(b) State how aerobic and anaerobic respiration differ.

[2]

(c) Describe a commercial use of anaerobic respiration.

[5]

[Total: 10]

8 **Or** Describe the functions in a plant of

(a) cell walls,

[5]

(b) cell membranes.

[5]

[Total: 10]

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Question 4 Fig. 4.1 © David W. Manser.

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