



**Cambridge International Examinations**  
Cambridge International Level 1/Level 2 Certificate

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**BIOLOGY**

**0610/33**

Paper 3 Extended

**May/June 2014**

**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 a 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.

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.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **16** printed pages.

- 1 Fungi were often classified as different species according to their visible reproductive structures.

*Penicillium dodgei* and *Eupenicillium brefeldianum* were classified as different species because they had different types of spores.

However, recently it was recognised that the spores of *P. dodgei* were asexual spores, while those of *E. brefeldianum* were sexual spores. A comparison of the DNA of these two fungi shows that they are the same species.

This fungus is now known as *Penicillium brefeldianum*.

- (a) State how DNA analysis can show that *P. dodgei* and *E. brefeldianum* are the same species.

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

- (b) (i) Describe how a fungus, such as *P. brefeldianum*, reproduces asexually.

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

- (ii) Discuss the advantages of **asexual** reproduction.

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

[Total: 8]

2 Sulfur dioxide (SO<sub>2</sub>) can cause acid rain.

(a) Name **one** other pollutant that can cause acid rain.

.....[1]

(b) Describe the effects of acid rain on the environment.

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

(c) State **three** methods to reduce atmospheric SO<sub>2</sub> pollution.

1 .....  
.....  
2 .....  
.....  
3 .....  
.....  
.....[3]



- (ii) Suggest why the concentration of sulfur in the plant tissues was calculated as a **percentage** of the **dry mass** of the plant tissue.

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

[Total: 12]

3 (a) Define the term *sensitivity*.

.....

.....

.....

.....[2]

(b) Describe how voluntary actions differ from involuntary actions.

.....

.....

.....

.....

.....[2]

(c) Name the neurone that transmits impulses from a receptor.

.....[1]

(d) Reaction time is defined as the time taken to respond to a stimulus.

During a swimming relay race, the reaction times of four swimmers in two teams, **A** and **B**, were recorded.

In each team, swimmer 1 responded to the sound of the start gun; swimmers 2, 3 and 4 responded to seeing the previous swimmer touch the swimming pool wall.

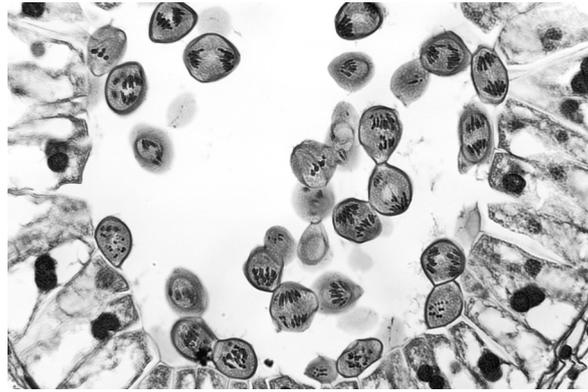
Table 3.1 shows the reaction times for the swimming relay teams.

**Table 3.1**

swimmer	reaction time/s	
	team <b>A</b>	team <b>B</b>
1	0.81	0.75
2	0.48	0.40
3	0.58	0.06
4	0.31	0.35



- 4 (a) Fig. 4.1 shows a section through the anther of a lily flower. The cells in the centre are dividing by meiosis.



**Fig. 4.1**

- (i) Name the product of meiosis that is formed in anthers.

.....[1]

- (ii) Explain the importance of meiosis in sexual reproduction.

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

- (b) Fig. 4.2 shows a flower of *Lilium polyphyllum*, a lily that grows in the Himalayan mountains. This species is cross-pollinated by insects.



Fig. 4.2

- (i) Explain what is meant by *cross-pollination*.

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

- (ii) Name **one** feature **visible** in Fig. 4.2 that helps to attract insects.

.....[1]



5 Fig. 5.1 shows a cross-section of a kidney.

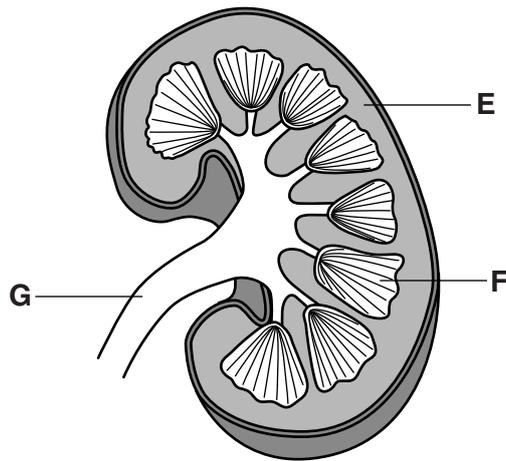


Fig. 5.1

(a) Name the structures labelled, **E**, **F** and **G** as shown in Fig. 5.1.

**E** .....

**F** .....

**G** .....

[3]

(b) Explain the function of the renal capsule in the kidney.

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





- (g) Before a kidney is transplanted, it is important to match the tissue type of the donor with the tissue type of the recipient.

State why this is necessary.

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

[Total: 20]

- 6 Fig. 6.1 shows the carbon cycle. P, Q, R, S and T each represent a part of the carbon cycle.

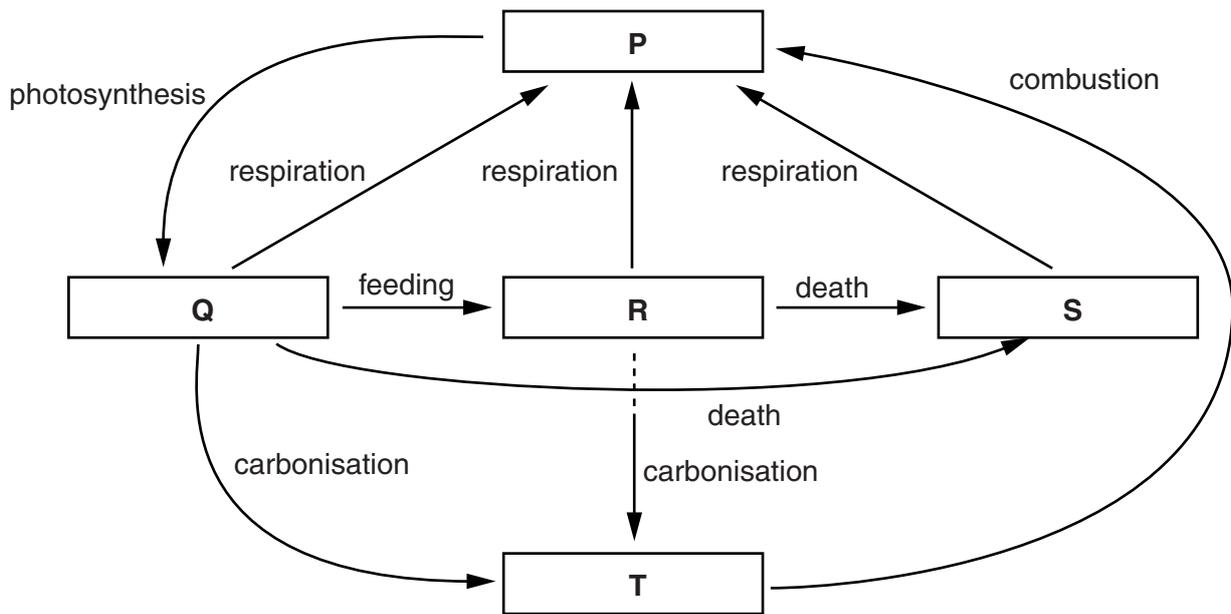


Fig. 6.1

- (a) Complete Table 6.1 by identifying P, Q, R and S and the name of **one** example of a carbon compound found in each. T has been completed for you.

Table 6.1

letter	part of cycle	carbon compound found in each part
<b>P</b>		
<b>Q</b>		
<b>R</b>		
<b>S</b>		
<b>T</b>	fossil fuels, e.g. natural gas	methane

[4]



(d) Environmental factors can be controlled in glasshouses.

Describe how **three** environmental factors are controlled in a glasshouse to improve crop yield.

factor 1: .....

how is it controlled: .....

.....

factor 2: .....

how is it controlled: .....

.....

factor 3: .....

how is it controlled: .....

.....

[3]

[Total: 15]

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*Copyright Acknowledgements:*

- Question 2 Figure 2.1     © Xue-Yan Liu, Hua-Yun Xiao, Cong-Qiang Liu, Hong-Wei Xiao, Yan-Li Wang; Assessment of atmospheric sulphur with the epilithic moss *Haplocladium microphyllum*: Evidences from tissue sulphur and  $\delta^{34}\text{S}$  analysis. *Environmental Pollution*; Elsevier; 2009.
- Question 4 Figure 4.1     © Biodisc; Cross-section of a Lily anther showing the second meiotic division (*Lilium*), a monocot. LM X65; Visuals Unlimited; 2011.
- Question 4 Figure 4.2     © Anurag Dhyani; LILIES and Related Plants, 2011-2012. Phenology of *Lilium polyphyllum* in Garhwal Himalaya, India; RHS Lily Group; 2011.

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