



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

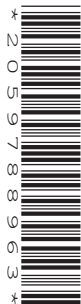
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**BIOLOGY**

**0610/33**

Paper 3 Extended

**October/November 2015**

**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.

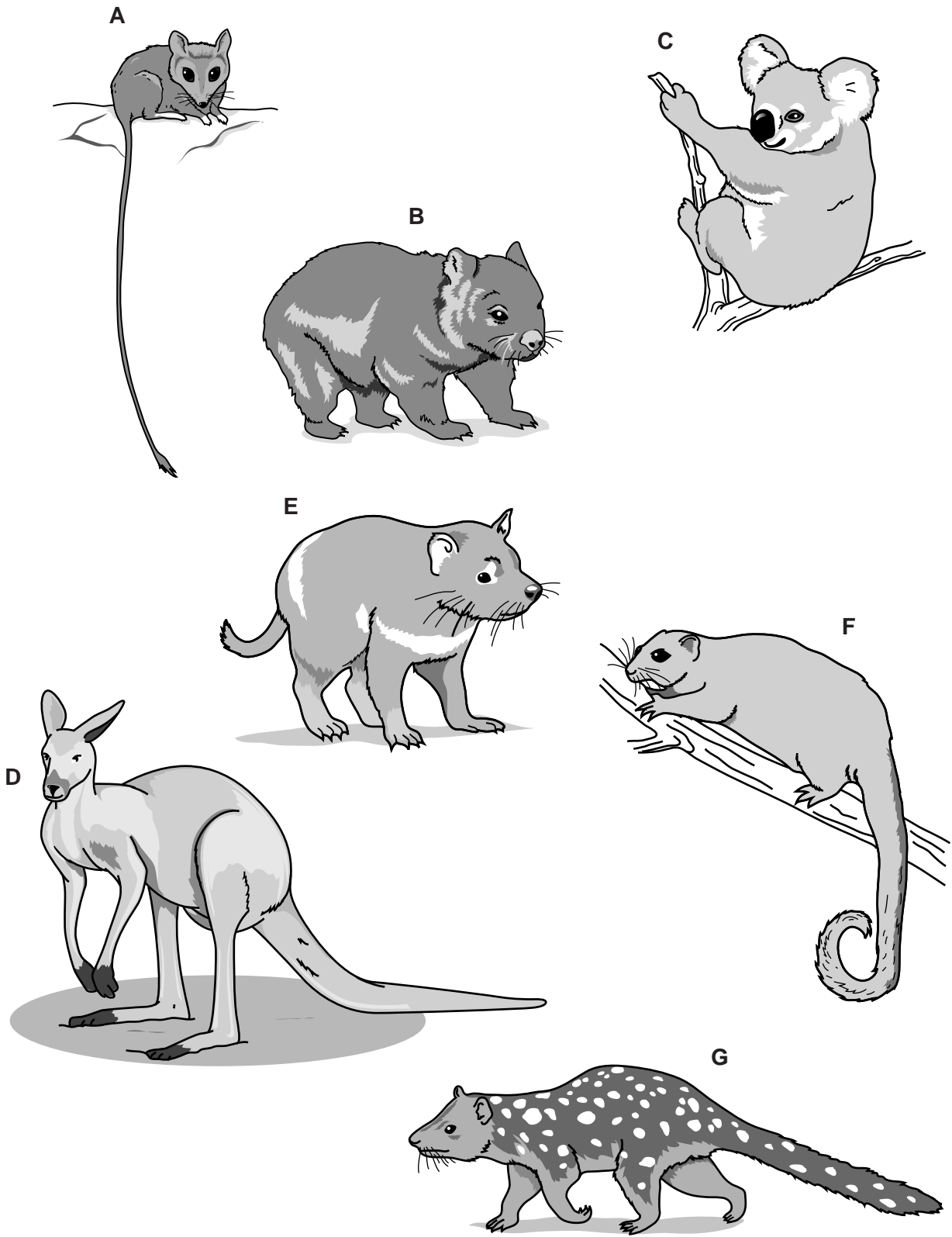
At the end of the examination, fasten all your work securely together.

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

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 **18** printed pages and **2** blank pages.

1 Fig. 1.1 shows seven marsupial mammals.



not drawn to scale

Fig. 1.1



(c) Marsupials differ from other mammals by giving birth to relatively undeveloped offspring. Female humans have a placenta and therefore give birth to more developed offspring.

(i) Describe the role of the placenta in humans.

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.....  
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.....  
.....  
.....  
.....  
.....[4]

(ii) In humans, the placenta is connected to the amniotic sac which contains amniotic fluid. State **two** functions of the amniotic fluid.

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

**[Total: 14]**

2 Fig. 2.1 shows a diagram of the liver and the blood vessels that enter and exit from it.

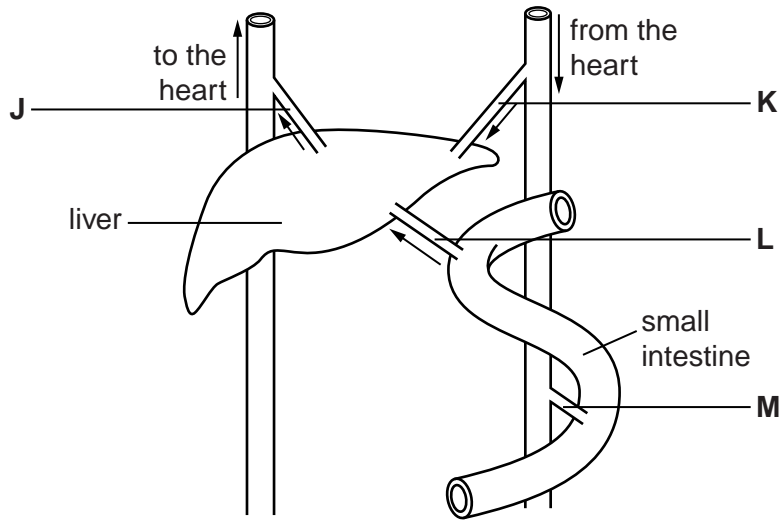


Fig. 2.1

(a) Name blood vessel L.

.....[1]

(b) Blood vessel J is a vein.

State **two** structural features of veins and explain how each feature is related to its function of returning blood to the heart.

feature .....

explanation .....

.....

feature .....

explanation .....

.....[4]

- (c) Blood samples were taken from each of the blood vessels **J**, **K**, **L** and **M** two hours after a meal of rice. Table 2.1 shows the concentration of glucose in these blood samples.

**Table 2.1**

| blood vessel | blood glucose concentration<br>/mg per 100 cm <sup>3</sup> |
|--------------|--|
| <b>J</b>     | 135  |
| <b>K</b>     | 128  |
| <b>L</b>     | 181  |
| <b>M</b>     | 133  |

Calculate the percentage increase in blood glucose concentration between blood vessel **J** compared with **L**. Express your answer to the nearest whole number.

Show your working.

..... %  
[2]

- (d) Control of blood glucose by the liver is an example of homeostasis.

- (i) Explain how the liver lowers blood glucose concentration when it is too high.

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

- (ii) Name **one other** factor in the human body that is also controlled by homeostasis.

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

(e) Amino acids are processed by the liver.

Describe this process.

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

(f) State **one other** function of the liver, besides homeostasis and processing amino acids.

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

**[Total: 14]**

3 Researchers designed an investigation to find the effect of increasing levels of exercise on two groups of people.

The first group of people were trained cyclists and the second group were untrained cyclists.

The researchers asked all the people to cycle at four levels of effort: 30%, 45%, 60% and 75% of their maximum cycle speed.

They cycled for eight minutes at each level of effort.

(a) The researchers predicted that the pulse rate of all the cyclists would increase during exercise.

Explain this prediction.

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.....[2]

Fig. 3.1 shows the average concentration of lactic acid in the blood of the trained cyclists and untrained cyclists in the investigation.

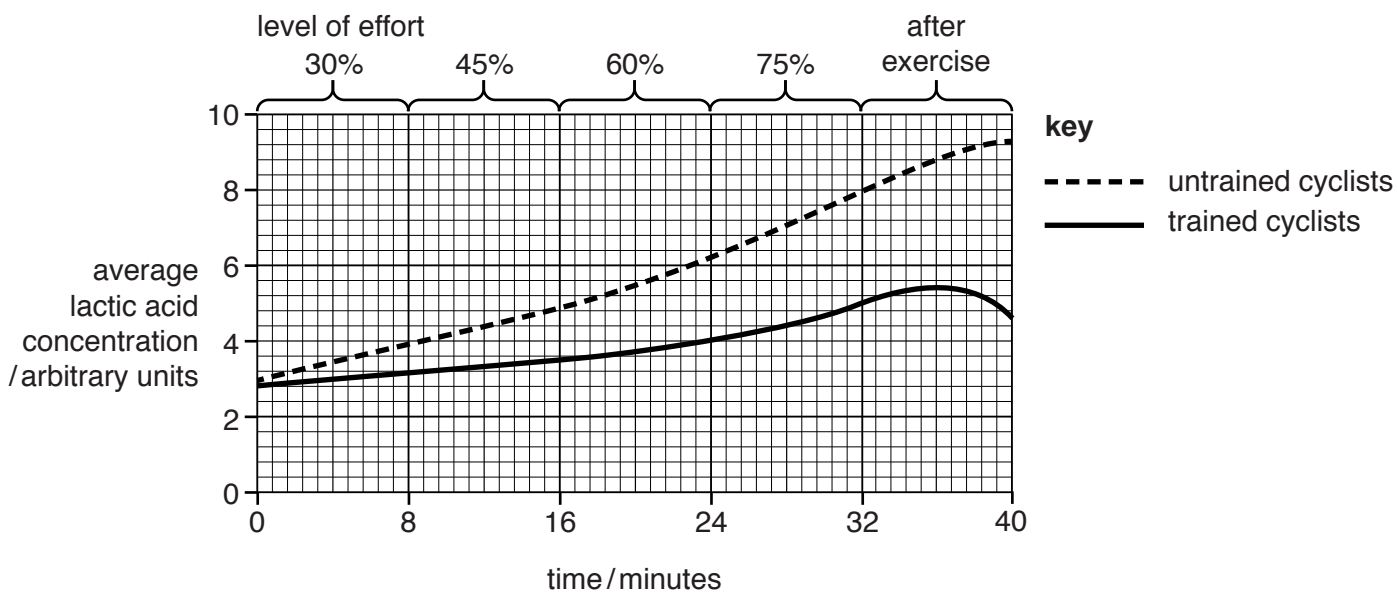


Fig. 3.1







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(ii) Compare the density of stomata between the two varieties of olive plant, **A** and **B**, shown in Fig. 4.1.

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

(iii) Under identical environmental conditions the rate of water uptake in plant **A** is higher than plant **B**.

Explain why.

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

(c) The density of stomata is an example of a leaf adaptation to the environmental conditions.

State **two** other adaptations of leaves for survival in a **dry** environment.

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

(d) Water lost from the leaves enters the atmosphere.

Describe how water is recycled from the atmosphere back to the roots.

.....

.....

.....

.....

.....[2]

**[Total: 15]**

5 Plastic bags cause many problems in the environment.

(a) Plastic bags were banned in Bangladesh in 2002.

Outline the effects of non-biodegradable plastics on the environment.

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.....[3]







6 (a) Define the term *genetic engineering*.

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.....[2]

(b) Fig. 6.1 is a flow diagram that shows how insulin can be produced using genetic engineering.

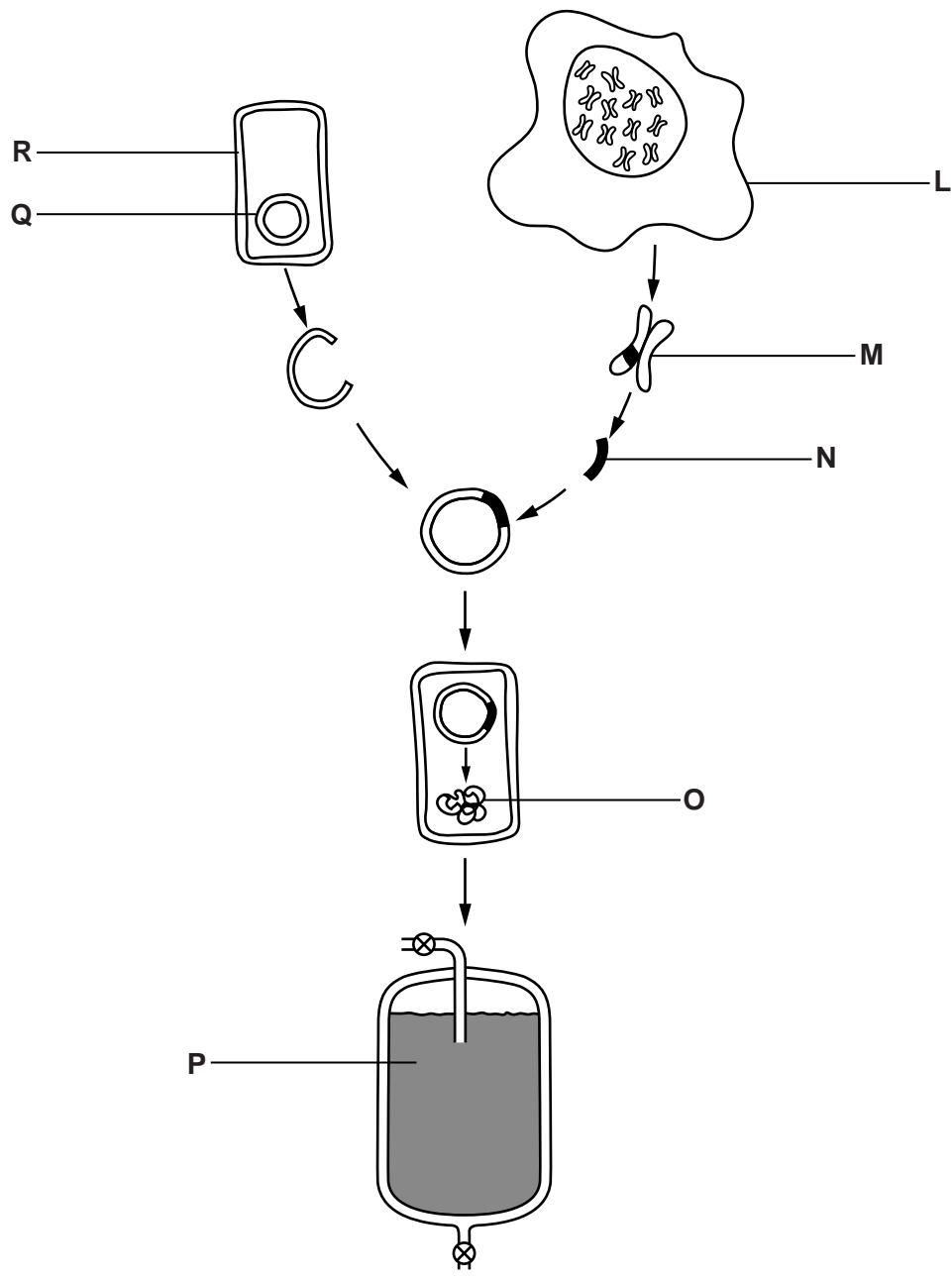


Fig. 6.1



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