UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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| CANDIDATE NAME | | | | | | | | | |
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*2856902052*

**BIOLOGY** **0610/23**

Paper 2 Core **May/June 2013**

**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, highlighters, 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 **19** printed pages and **1** blank page.


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**1** Flowering plants are classified into two groups, the monocotyledons and the eudicotyledons (dicotyledons).

**(a)** Complete Table 1.1 to show differences between these two groups.

**Table 1.1**

| | monocotyledons | eudicotyledons |
|---|---|---|
| number of cotyledons in seed | | |
| pattern of veins in leaf | | |
| number of flower parts e.g. petals | | |

[4]

**(b)** State **two** environmental stimuli that flowering plants can detect.

1 .....

2 ..... [2]

**(c)** Fig. 1.1 shows a cross section of part of a eudicotyledonous (dicotyledonous) plant as seen through a microscope.

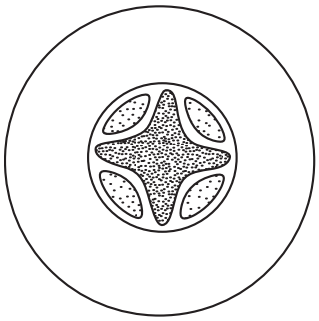


**Fig. 1.1**

**(i)** Name the part of a plant through which the section has been cut.

..... [1]

**(ii)** On Fig. 1.1, draw a line to label the phloem tissue and a line to label the xylem tissue.

Label the phloem and xylem tissues. [2]

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**(iii)** Describe **two** functions of xylem tissue.

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1 .....

.....

2 .....

..... [2]

**[Total: 11]**

**2** State **and** explain **two** ways in which the use of agricultural machinery and fertilisers have helped to increase food production.

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agricultural machinery

1 .....

.....

.....

2 .....

.....

.....

fertilisers

1 .....

.....

.....

2 .....

.....

..... [6]

**[Total: 6]**

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**3 (a) (i)** State how a human zygote is formed.

.....

.....

.....

..... [2]

**(ii)** Outline the early development of a human zygote before it becomes a fetus.

.....

.....

.....

..... [2]

**(b)** Fig. 3.1 shows the tissues of the mother and fetus in the placenta of humans.

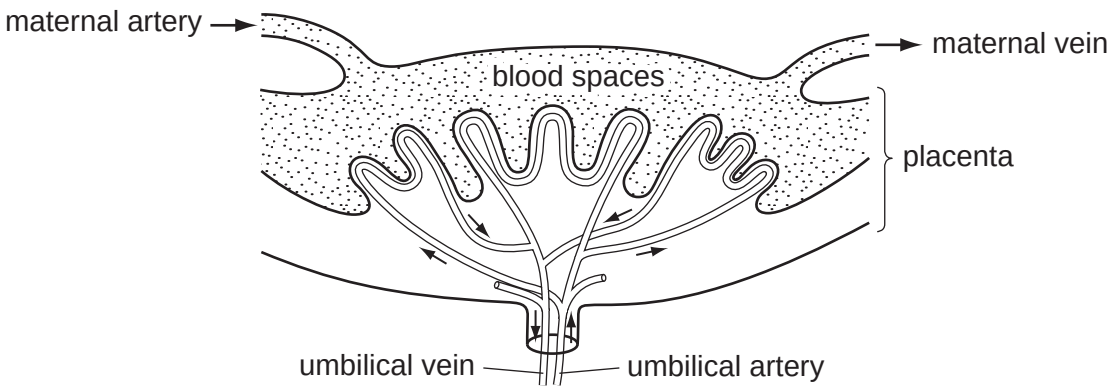



**Fig. 3.1**

The diagram shows that the blood systems of the mother and the fetus are separate.

**(i)** Suggest **one** reason why the two blood systems should be kept separate.

.....

..... [1]

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**(ii)** The placenta is often described as “a small intestine, a lung and a kidney”.

Explain how the placenta functions like each of these organs.

small intestine .....

.....

.....

.....

lung .....

.....

.....

.....

kidney .....

.....

.....

..... [6]

**(c)** Describe **two** ways in which a pregnant mother could help the healthy development of her fetus.

1 .....

.....

2 .....

..... [2]

**[Total: 13]**

**Question 4 begins on page 8.**

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**4** **(a)** Sulfur dioxide is a pollutant gas produced when some types of fossil fuel are burnt.

Describe **three** undesirable effects of sulfur dioxide pollution.

1 .....

.....

2 .....

.....

3 .....

..... [3]

**(b)** Sulfur dioxide in the air can affect a type of organism called a lichen.

Fig. 4.1 shows the numbers of three types of lichen, **K**, **L** and **M**, growing near to an industrial site that releases sulfur dioxide.

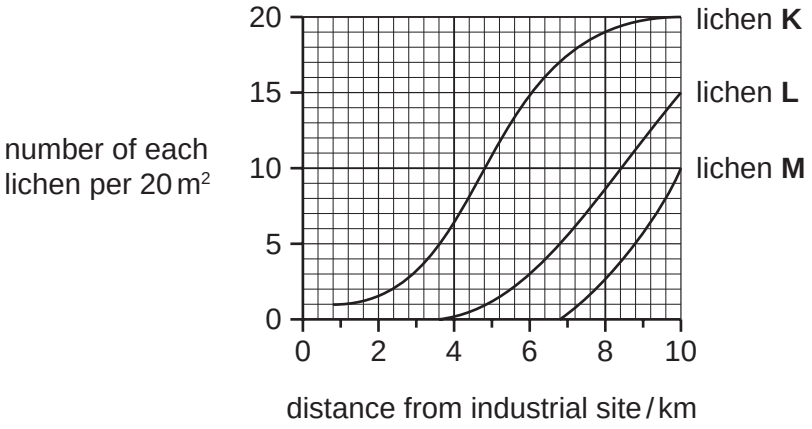



**Fig. 4.1**

**(i)** State which type of lichen grows closest to the industrial site.

..... [1]

**(ii)** State which types of lichen you would expect to find growing 5 km from the industrial site.

..... [1]

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**(iii)** Explain which type of lichen is most affected by the sulfur dioxide.

.....

.....

.....

..... [2]

**(iv)** Calculate how many lichen plants you would expect to find in a 20 $m^2$ area at 10 km from the industrial site.

Show your working.

..... lichen plants [2]

**[Total: 9]**

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**5** **(a)** An investigation was carried out by a student on the effect of temperature on the digestion of fat by an enzyme.

**(i)** Name an enzyme that digests fats.

..... [1]

**(ii)** One product of fat digestion is fatty acids.

Name the other product.

..... [1]

Six test-tubes containing the same volume of olive oil and the enzyme solution were set up.

One drop of an indicator was added to each test-tube.

The six test-tubes were labelled and placed in separate water baths at different temperatures.

The indicator was blue at the start and changed to yellow when the pH fell to pH 5 or below.

The time for the contents of each test-tube to turn yellow was recorded.

**(iii)** Suggest why the pH of the mixture would fall as digestion takes place.

.....

..... [1]

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**Question 5 continues on page 12.**

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**(b)** Table 5.1 shows the results of this investigation.

**Table 5.1**

| temperature / °C | time to turn yellow / hours |
|---|---|
| 5 | 23 |
| 15 | 14 |
| 25 | 8 |
| 35 | 5 |
| 45 | 15 |
| 55 | 29 |

**(i)** Plot the results on Fig. 5.1.

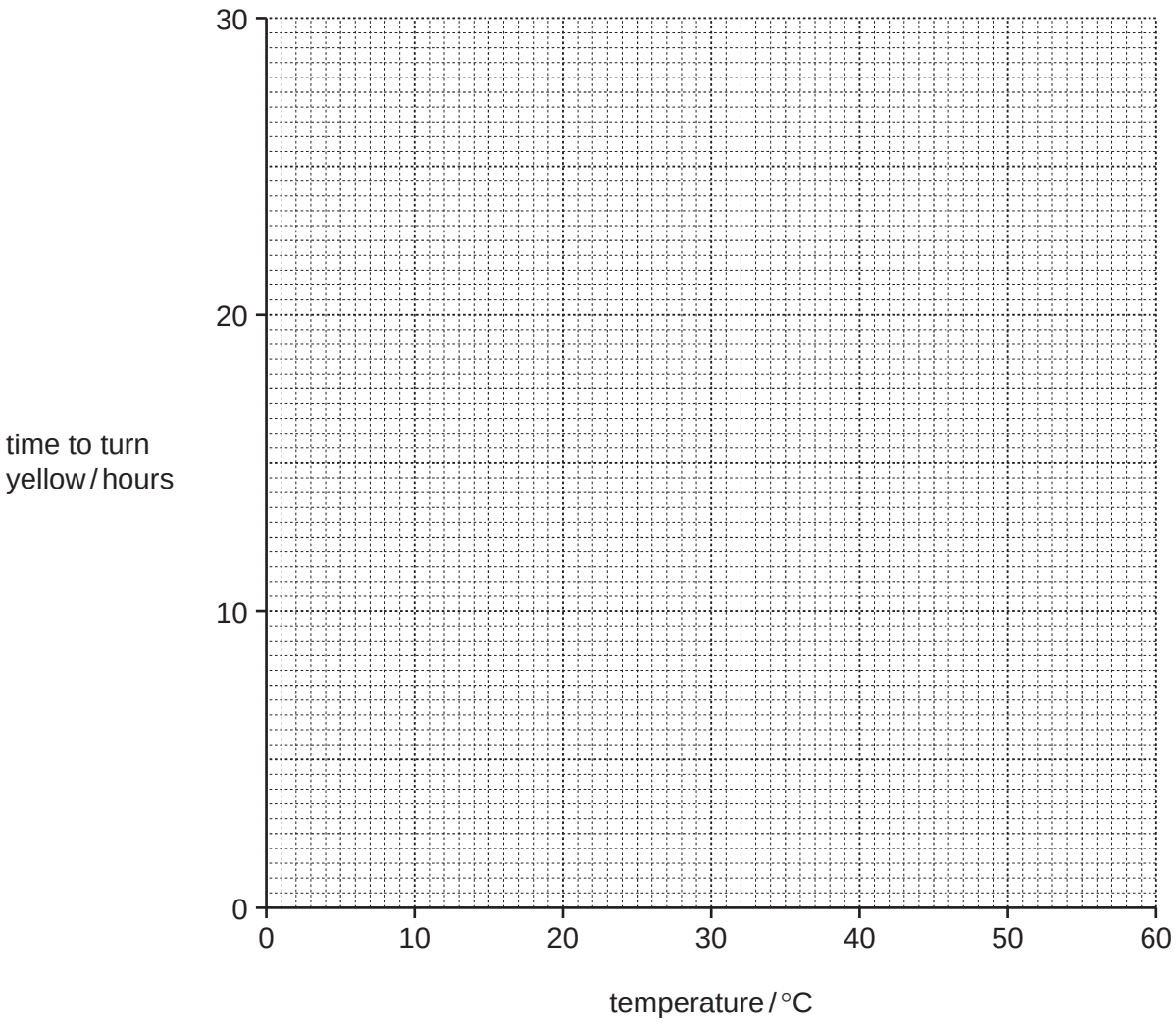



**Fig. 5.1**

[3]

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**(ii)** State the temperature at which the reaction was fastest (optimum temperature).

..... [1]

**(c)** Another student repeated the investigation.

This student added bile to each test-tube, as well as the enzyme.

**(i)** Explain the function of bile in the digestion of fat.

.....

.....

.....

.....

..... [3]

**(ii)** Predict the results of the second investigation.

Include in your answer a reference to rate of reaction and optimum temperature.

.....

.....

..... [2]

**[Total: 12]**

**6** Complete the sentences about respiration by writing the most appropriate word(s) in each space.

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Respiration in living cells is a series of chemical reactions that release energy. These chemical reactions are speeded up by ..... .

If a yeast cell does not have enough oxygen it may carry out ..... respiration. In this process ..... and carbon dioxide are formed. This type of respiration in yeast is used by humans in .....

In humans, when muscle cells do not have enough oxygen during exercise, ..... is broken down into ..... [6]

**[Total: 6]**

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**7** **(a)** Animals such as birds and mammals can help in the dispersal of fruits and seeds.

**(i)** Seeds develop from ovules.

Name the structure from which fruits develop.

..... [1]

**(ii)** State **three** features of fruits that would help their dispersal by animals.

1 .....

.....

2 .....

.....

3 .....

..... [3]

**(iii)** Name **one** other mechanism of fruit or seed dispersal.

.....

..... [1]

**(b)** Describe **one** way in which insects can help in the life cycle of a flowering plant.

.....

.....

.....

..... [2]

**[Total: 7]**

**8** Fig. 8.1 shows the energy flow through a food chain.

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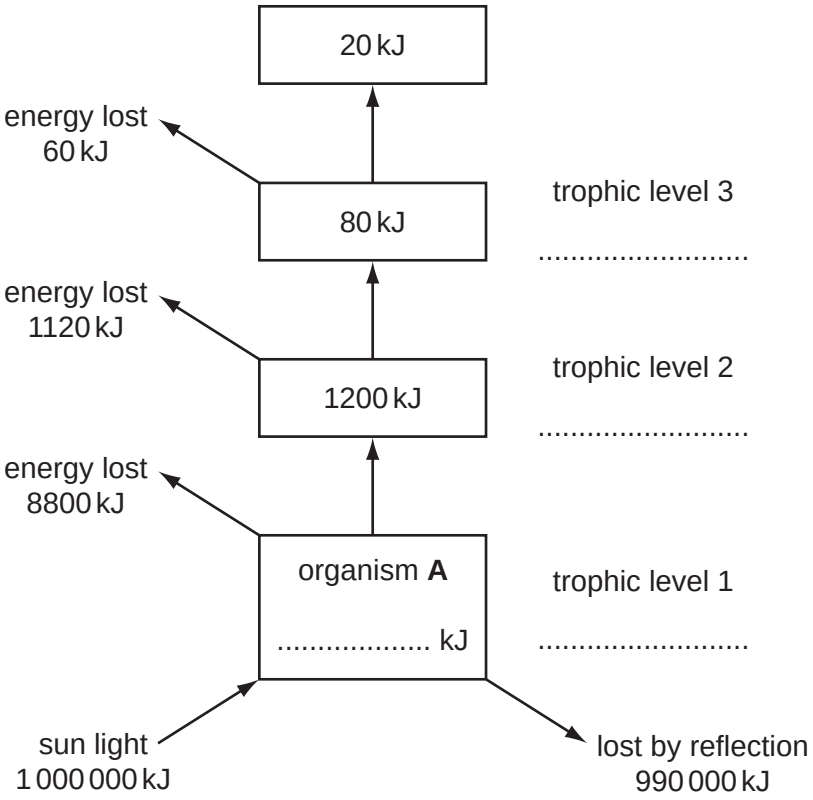



**Fig. 8.1**

**(a)** On Fig. 8.1, write carnivore, herbivore or producer at the correct trophic level. [3]

**(b) (i)** Use Fig. 8.1 to calculate the quantity of energy trapped by organism **A**.

..... kJ [1]

**(ii)** Name the process by which organism **A** traps energy.

..... [1]

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**(iii)** State **two** ways by which energy is lost at each trophic level.

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1 .....

.....

2 .....

..... [2]

**[Total: 7]**

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**9** Fig. 9.1 shows changes in the relative concentrations of four substances in the blood plasma. These changes happen when the blood flows through the renal artery, the capillaries in the kidney and the renal vein.

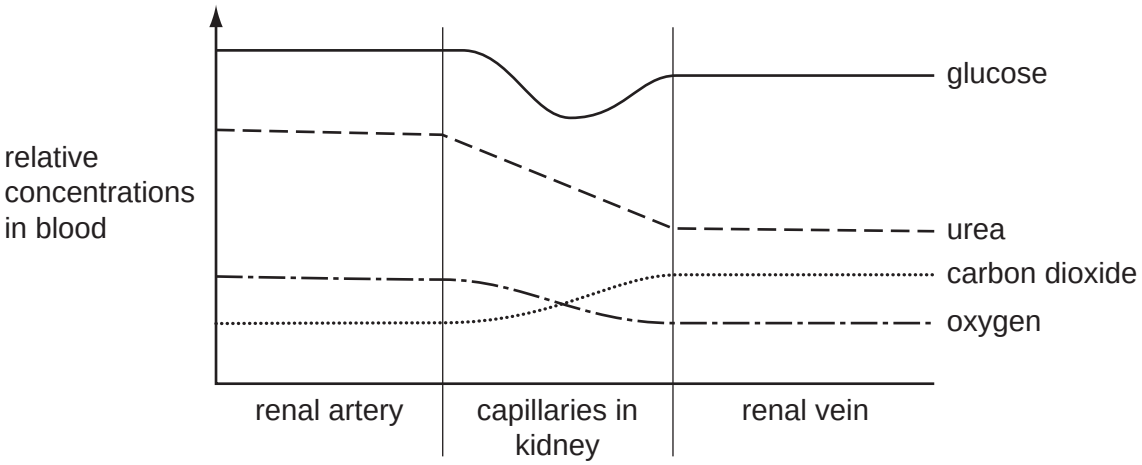



**Fig. 9.1**

**(a)** Explain the difference in the concentration of urea in the renal vein and in the renal artery.

.....

.....

.....

.....

.....

..... [3]

**(b)** Explain the differences in the concentration of oxygen **and** carbon dioxide shown in Fig. 9.1.

.....

.....

.....

.....

.....

..... [3]

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**(c)** Describe **and** explain the changes in glucose concentration shown in Fig. 9.1.

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.....

.....

.....

.....

.....

..... [3]

**[Total: 9]**

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