Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION

A223/01

TWENTY FIRST CENTURY SCIENCE

BIOLOGY A

Unit 3: Ideas in Context plus B7 (Foundation Tier)

WEDNESDAY 16 JUNE 2010: Morning
DURATION: 1 hour

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the Question Paper
A calculator may be used for this paper

OCR SUPPLIED MATERIALS:

Insert (inserted)

OTHER MATERIALS REQUIRED:

Pencil
Ruler (cm/mm)

READ INSTRUCTIONS OVERLEAF

DC (NF/SW) MEP60409 30525/3

INSTRUCTIONS TO CANDIDATES

- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your Candidate Number, Centre Number and question number(s).**

INFORMATION FOR CANDIDATES

- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this paper is 55.**
-  **Where you see this icon you will be awarded a mark for the quality of written communication in your answer.**

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Answer ALL the questions.

1 THIS QUESTION IS BASED ON THE ARTICLE 'WORLD'S COMMON BIRDS ARE DECLINING'.

(a) The loss or destruction of a bird's habitat could result in a lowering of numbers of birds.

Write down two reasons why.

1 _____

2 _____

[2]

(b) In Europe, how many common bird species declined in numbers during the 26-year period?

answer _____ **[1]**

(c) An organisation involved in the conservation of birds decided that 'action was needed sooner rather than later'.

Using the example of the albatross, suggest

- **what action is needed**
- **why action is needed soon.**

_____

_____

_____ **[2]**

(d) The white-rumped vulture population has been reduced by 99.9%.

Suggest two reasons why this measurement may not be accurate.

1 _____

_____

2 _____

_____

[2]

(e) The white-rumped vulture is in danger of extinction.

Write down two things that could be done to ensure that the vulture is not poisoned.

1 _____

2 _____

[2]

(f) Red kites were once said to be extinct in England.

They have now been reintroduced and are thriving.

Explain why this use of the word 'extinct' was misleading.

_____

_____ **[1]**

(g) The article is about reducing biodiversity.

(i) Explain what is meant by <u>REDUCING BIODIVERSITY</u>.

One mark is for a clear, ordered answer.

_____

_____

_____ **[2+1]**

(ii) Explain the importance of maintaining biodiversity.

_____

_____ **[1]**

(h) How much would it cost to save 90% of Africa's biodiversity for ten years?

£ _____ **million [1]**

[Total: 15]

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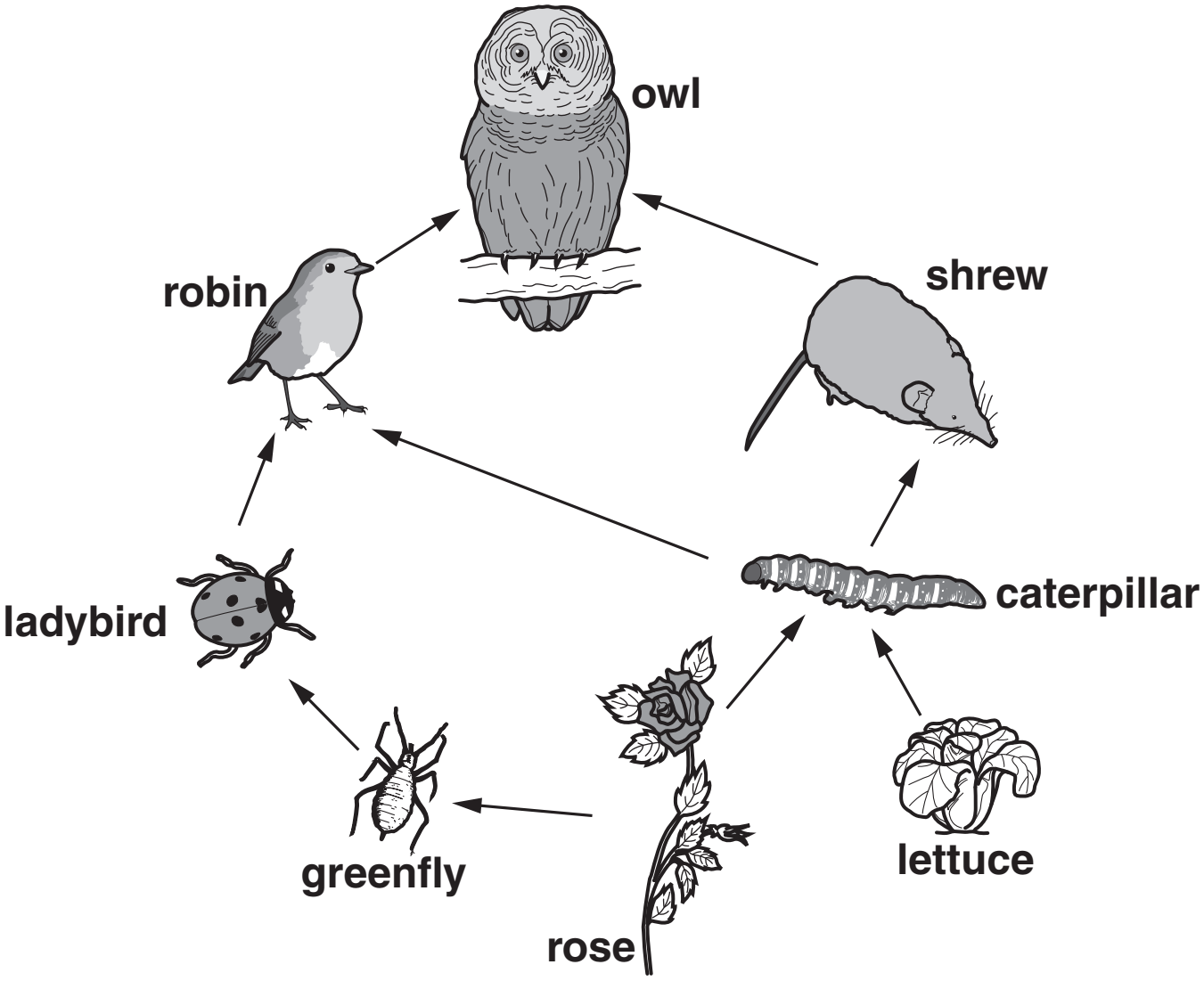
2 Look at the food web.



(a) Write down the name of <u>ONE</u> autotroph and <u>ONE</u> heterotroph from the food web.

autotroph _____

heterotroph _____

[1]

(b) Autotrophs are different from heterotrophs.

Explain how.

_____

_____

_____ **[2]**

(c) Energy passes through the food web.

(i) What is the source of this energy?

_____ **[1]**

(ii) How is energy transferred <u>BETWEEN</u> the organisms in the food web?

_____

_____ **[1]**

(iii) Write down two ways in which energy is lost from this food web.

1 _____

2 _____

[2]

[Total: 7]

3 (a) These statements are stages in the process of photosynthesis.

A oxygen produced as a waste product

B light energy absorbed by chlorophyll

C energy used to rearrange atoms of carbon dioxide and water

They are in the wrong order.

Fill in the boxes with the letters A, B and C to put the stages in the correct order.

☐ ☐ ☐

[2]

(b) Describe three ways in which plants may use glucose produced by photosynthesis.

1 _____

2 _____

3 _____

[3]

(c) Plants grow in soil.

Write down three different components of soil.

1 _____

2 _____

3 _____

[2]

[Total: 7]

4 Photosynthesis takes place in green plants.

(a) Write down three factors that can limit the rate of photosynthesis.

1 _____

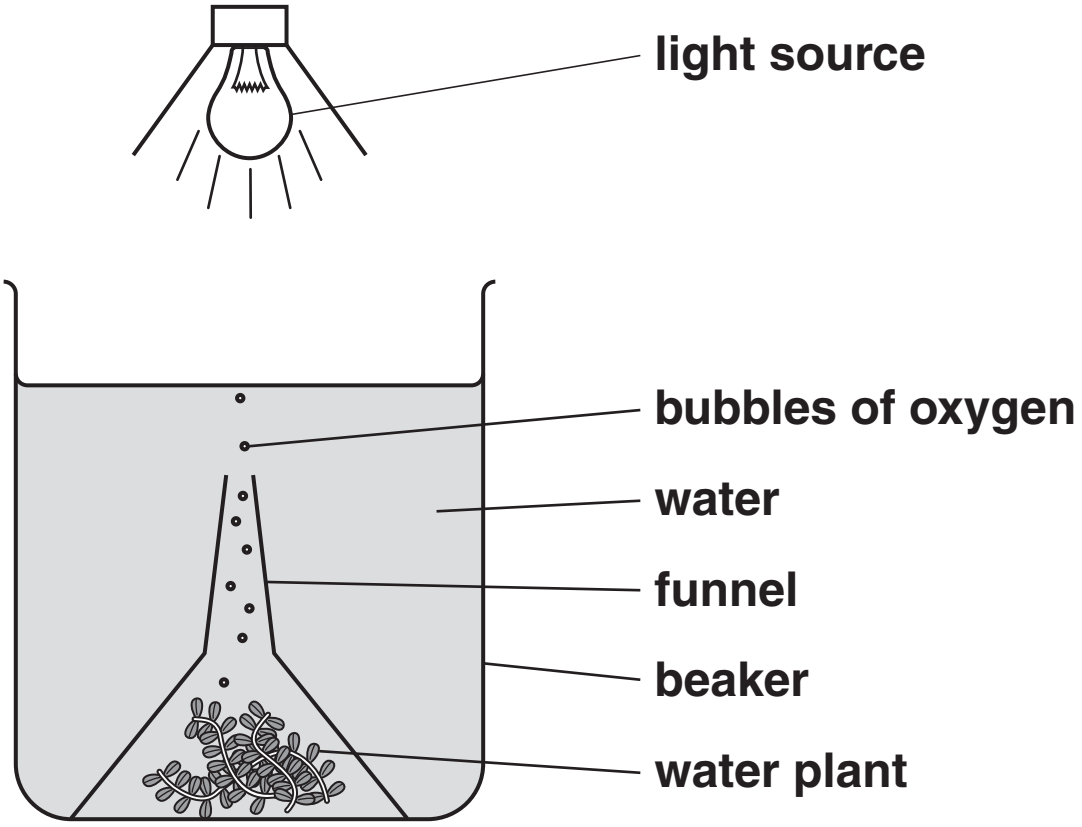
2 _____

3 _____

[2]

(b) The rate at which photosynthesis takes place can be measured.

One way to do this is to count the bubbles of oxygen given off by a water plant in one minute.



We can never be sure that a measurement tells us the true value of a quantity being measured.

Explain why trying to count the number of bubbles in one minute in this experiment may not give a <u>TRUE VALUE</u> for the rate of photosynthesis.

_____

_____

_____

_____

_____ **[3]**

[Total: 5]

5 A flea is an example of a parasite.

(a) Explain what is meant by a PARASITE.

_____

_____

_____ **[2]**

(b) Name ONE example of a parasite other than a flea.

Describe two features of this parasite that help it to be successful.

parasite _____ **[1]**

feature 1 _____

_____

feature 2 _____

_____

[2]

(c) State ONE important effect of parasites on humans.

_____ **[1]**

[Total: 6]

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6 Neil and Anita want to have a baby.

They are worried that they might be carriers for cystic fibrosis, a genetic disorder.

They have a genetic test using DNA technology.

Explain how the test is carried out.

You <u>MUST</u> include these words in your answer.

<u>AUTORADIOGRAPHY</u>

<u>DNA</u>

<u>GENE PROBE</u>

<u>WHITE BLOOD CELLS</u>

_____

_____

_____

_____

_____

_____ **[4]**

[Total: 4]

7 Steve is an athlete.

(a) He releases energy from glucose by respiration.

Complete the word equation for AEROBIC respiration in muscle cells.

Choose substances from this list.

ALCOHOL CARBON DIOXIDE LACTIC ACID

OXYGEN STARCH WATER

glucose + oxygen → _____

+ _____ + energy [2]

(b) When Steve is running, his muscle cells require a FASTER supply of oxygen and glucose.

(i) Explain why.

_____

_____

_____ **[2]**

(ii) Explain how this faster supply is brought about.

_____

_____ **[2]**

[Total: 6]

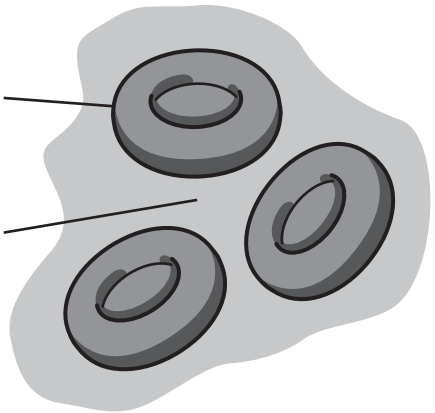
8 Human blood can be group A, B, AB or O.

(a) Look at the diagram of blood from a person who is <u>BLOOD GROUP B</u>.

Complete the labels using letters and words from the tables.

Each label needs a letter <u>AND</u> a word.

<u>LETTER</u>	<u>WORD</u>
A	ANTIBODIES
	ANTIGENS
B	DOMINANT
	HAEMOGLOBIN
O	RECESSIVE



____ _____ on the surface of a red blood cell

plasma containing ____ _____

[2]

(b) During blood transfusions it is important to make sure that the donor and recipient are compatible.

For this to happen, the antigens in the donor's blood must not match the antibodies in the recipient's blood.

The table shows blood groups for both donors and recipients.

		DONOR			
		A	**B**	**AB**	**O**
RECIPIENT	**A**		✘		✔
	B	✘	✔	✘	✔
	AB	✔		✔	✔
	O	✘	✘		✔

(i) Complete the table with ticks (✔) or crosses (✘) to show the compatibility for each of the blood groups.

There are four spaces to complete. [2]

(ii) Which blood group, A, B, AB or O, can be donated to all other blood groups?

answer _____ **[1]**

[Total: 5]

END OF QUESTION PAPER