OCR
RECOGNISING ACHIEVEMENT

H

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE BIOLOGY A

A223/02

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

A217880611

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)

Wednesday 15 June 2011
Morning

Duration: 1 hour

A223021

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- The insert will be found in the centre of this document.
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- 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).
- Answer **all** the questions.
- Do **not** write in the bar codes.

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.
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 This question is based on the article 'Anti-wrinkle cream causes stampede at shops'.

Use the information in the article to answer this question.

(a) The anti-wrinkle cream contains different substances.

(i) It is not possible to say which of these substances is the effective ingredient.

Explain why.

.....

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

(ii) How should the scientists extend the study to find out which is the effective ingredient?

.....

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

(b) Look at the pictures of the eyes in the article.

Suggest **two** reasons why the pictures alone can **not prove** whether the anti-wrinkle cream works.

1 .....

2 .....
[2]

(c) The research was funded by the manufacturer of the anti-wrinkle cream.

Suggest how this could have affected the findings of the research.

.....

.....

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

(d) Look at the comments made by the three members of the public.

(i) Use information in the article to suggest why **Peter's** comment is incorrect.

.....

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

(ii) In what way has **Wendy** misunderstood the results of the trial?

.....

.....

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

(iii) Suggest why **Sue** may have wasted her money.

.....

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

(e) Ageing skin and sun-damaged skin become wrinkled.

Suggest a mechanism to explain how this might happen.

.....

.....

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

[Total: 13]

2 Nearly all organisms are ultimately dependent on a single source for their energy.

(a) Put a (ring) around the correct ultimate source of energy for nearly all living organisms.

the Moon **other animals** **the sea** **the Sun** **other plants** **[1]**

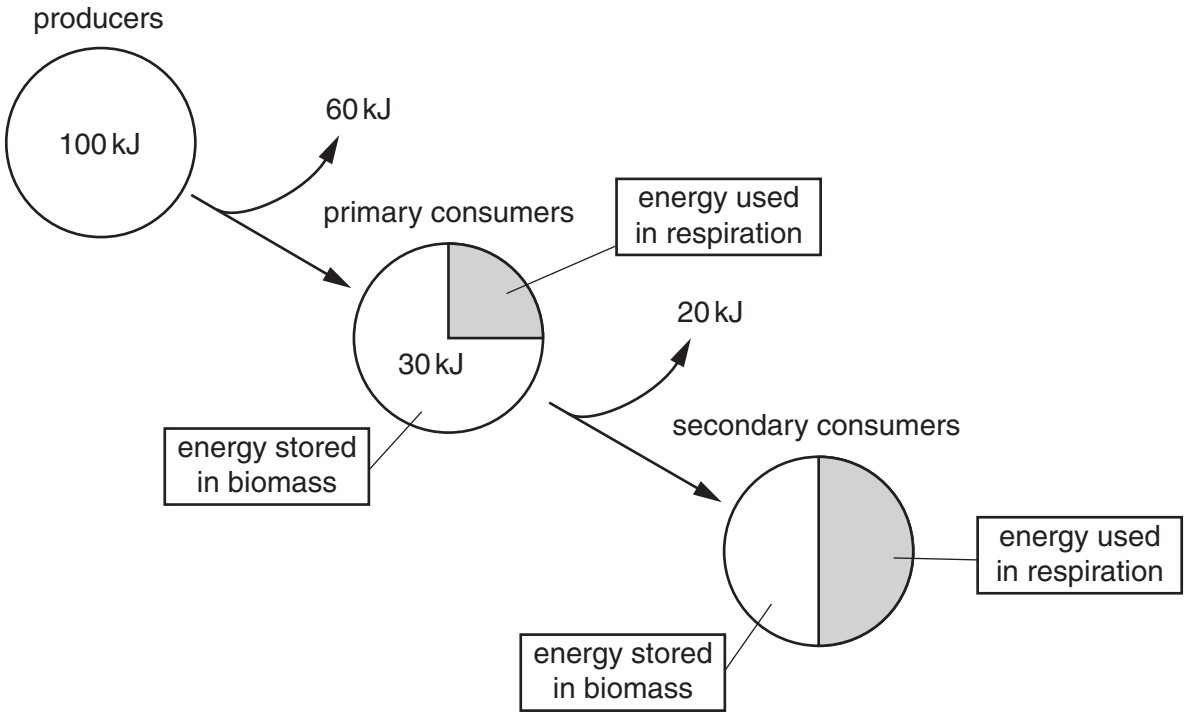
(b) In an ecosystem both autotrophs and heterotrophs are found.

Explain how an **autotroph** is different from a heterotroph.

.....

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

(c) The pie charts show how 100 kJ of energy is transferred through a food chain.



(i) What percentage of the energy in the producers is used in respiration in the primary consumers?

Show your working.

answer = ... % **[2]**

(ii) Energy is transferred from the producers to the biomass of the secondary consumers.

What is the energy efficiency of this transfer?

answer = ... % **[1]**

(d) Describe ways in which energy is lost from a food chain.

One mark is for correct spelling, punctuation and grammar.

.....

.....

.....

..... **[3+1]**

[Total: 10]

3 Plants produce glucose by photosynthesis.

(a) Although plants produce glucose they convert it into starch.

Explain why.

.....

.....

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

(b) Plants can convert starch into proteins by the addition of nitrogen from nitrates.

Plants absorb nitrates from the soil by **active transport**.

Explain what is meant by active transport.

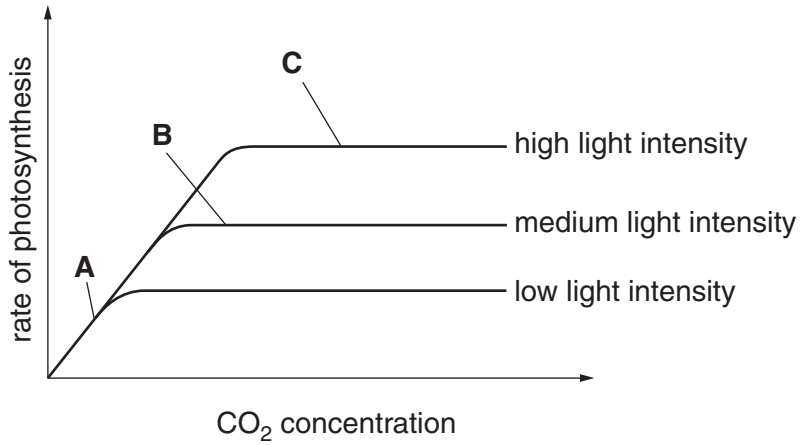
.....

.....

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

(c) The production of glucose by photosynthesis is affected by limiting factors.

Look at the graph.



(i) What is the limiting factor at **A**?

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

(ii) What is the limiting factor at **B**?

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

(iii) What **other** factor is most likely to be limiting at **C**?

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

[Total: 7]

4 Symbiosis, commensalism and parasitism are all examples of types of relationships between organisms.

(a) Explain what is meant by symbiosis and commensalism.

symbiosis .....

.....

commensalism .....

.....

[2]

(b) Parasitism is a close association between two different organisms.

Explain the effect of this relationship on the **parasite** and its **host**.

.....

.....

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

(c) *Plasmodium* is the parasite that causes malaria.
It has certain features that enable it to be successful.

For one **other** named parasite, explain a feature that enables it to be successful.

name of parasite .....

feature .....

explanation .....

.....

[3]

(d) Carriers for sickle-cell anaemia have some protection from malaria.

(i) Describe the symptoms of sickle-cell anaemia.

.....

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

(ii) Explain why sickle-cell **carriers** do not have the full symptoms of the condition.

.....

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

[Total: 11]

5 Jessica is training for the London Olympics.

(a) When exercising, Jessica's muscles respire both aerobically and anaerobically.

Describe **three** ways in which aerobic respiration is different from anaerobic respiration.

difference 1 .....

.....

difference 2 .....

.....

difference 3 .....

.....

[3]

(b) Anaerobic respiration can lead to an oxygen debt.

Explain what is meant by an oxygen debt.

.....

.....

.....

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

[Total: 5]

6 Human blood groups can be **A**, **B**, **AB** or **O**.

(a) Complete these sentences about the inheritance of blood groups.

Choose words from this list.

one three four five

co-dominant dominant opposite recessive

Human **ABO** blood type is determined by ..... gene(s) with

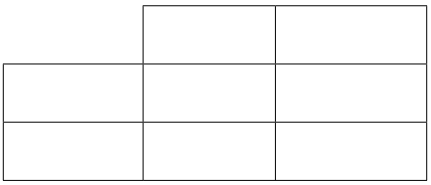
..... possible allele(s).

A and **B** are ..... .

O is ..... to both **A** and **B**. **[4]**

(b) A person who has blood group **AB** marries a person who has blood group **O**.

(i) Complete this genetic diagram to show possible genetic combinations of any children that they might have.



[3]

(ii) Write down the possible **blood groups** of their children.

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

[Total: 9]

END OF QUESTION PAPER

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