

Tuesday 12 June 2012 – Morning

**GCSE TWENTY FIRST CENTURY SCIENCE
BIOLOGY A**

A223/01 Unit 3: Ideas in Context plus B7 (Foundation Tier)

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

Duration: 1 hour

OCR supplied materials:

- Insert (inserted)

Other materials required:

- Pencil
- Ruler (cm/mm)




Candidate forename		Candidate surname	
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Centre number						Candidate number				
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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. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- 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).
- 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 ‘Alien Invaders’.

The article is about alien invaders in Europe.

(a) Explain what is meant by the term “alien invaders”.

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

(b) The article states that the alien invaders are reducing biodiversity.

What does this mean for the number of different species in the environment?

..... [1]

(c) Look at the maps in the article that show reports of harlequin ladybirds.

(i) Suggest in which part of the UK harlequin ladybirds first arrived.

..... [1]

(ii) What other conclusion can be drawn from the data in the maps?

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

(d) Refer to the information about Japanese knotweed in the final paragraph of the article.

Scientists are confident that releasing the insect from Japan will not cause any environmental harm in the UK.

Write down **one** reason why.

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

(e) Thirty years ago there were 600 alien invasive species in Europe.

(i) Use the article to help you calculate the number of alien invasive species that are present in Europe today.

Show your working.

answer = [2]

(ii) It is not possible to know the true number of alien invasive species now present in Europe.

A student suggests a range in which the true value lies.
The student's lower value is 600.

Suggest why the student's range is incorrect.

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

(iii) Suggest **two** reasons why it is important that we know which alien invasive species are living in Europe today.

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

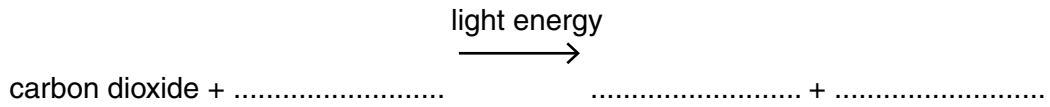
(f) Use the article to state **three** different ways in which alien invasive species are causing harm.

- 1
 - 2
 - 3
- [3]

[Total: 14]

2 This question is about photosynthesis.

(a) Complete the equation for photosynthesis.



[2]

(b) The table shows the main stages involved in photosynthesis. They are in the wrong order. Four statements are correct and two are incorrect. Put the four correct statements in the correct order. One has been done for you.

A	Oxygen is released as a waste product.
B	Molecules of carbon dioxide are used to make sugar.
C	Light reaches the plant.
D	The rate is limited by the amount of glucose.
E	Energy is absorbed by chlorophyll.
F	Nitrogen is used to make sugar.

			A
--	--	--	----------

[2]

(c) The amount of carbon dioxide in the atmosphere is increasing.

(i) Suggest **one** reason why.

.....
 [1]

(ii) Suggest the effect this increase will have on the rate of photosynthesis. Explain your answer.

.....

 [2]

(d) Plants use stored energy to make polymers. Write down the name of a polymer that is made from each of the following.

(i) glucose only

(ii) glucose and nitrates

[2]

[Total: 9]

3 This question is about parasites.

(a) Which of these statements best describes parasitism?
Put a tick (✓) in the box next to the correct answer.

Parasitism is a close association between two organisms where ...

... one organism eats only meat and the other eats only plants.

... both organisms benefit from each other.

... one organism benefits and the other is harmed.

... both organisms are harmed.

... both organisms eat only meat.

[1]

(b) A tapeworm is a successful parasite.
This is because it has hooks and suckers to keep it in position in an animal's gut.



Write down the name and **one** special feature of a **different** parasite.
Explain how the special feature enables it to be successful.

name of parasite

special feature

how it helps the parasite

.....

[2]

(c) The evolution of a parasite is closely linked to the evolution of its host.

Suggest why.

.....

.....

.....

..... [2]

[Total: 5]

Turn over

4 A lack of vitamin A in humans can cause blindness.

Rice does not contain vitamin A.
Some people who only have rice to eat may go blind.

A scientist genetically modified rice to produce vitamin A.
He used daffodils which can produce vitamin A.
This new rice is called Golden Rice.

Golden Rice could prevent many cases of blindness.

(a) Explain how the scientist performed this genetic modification.
Use the following words in your answer

- vector
- isolated
- transferred.

.....

.....

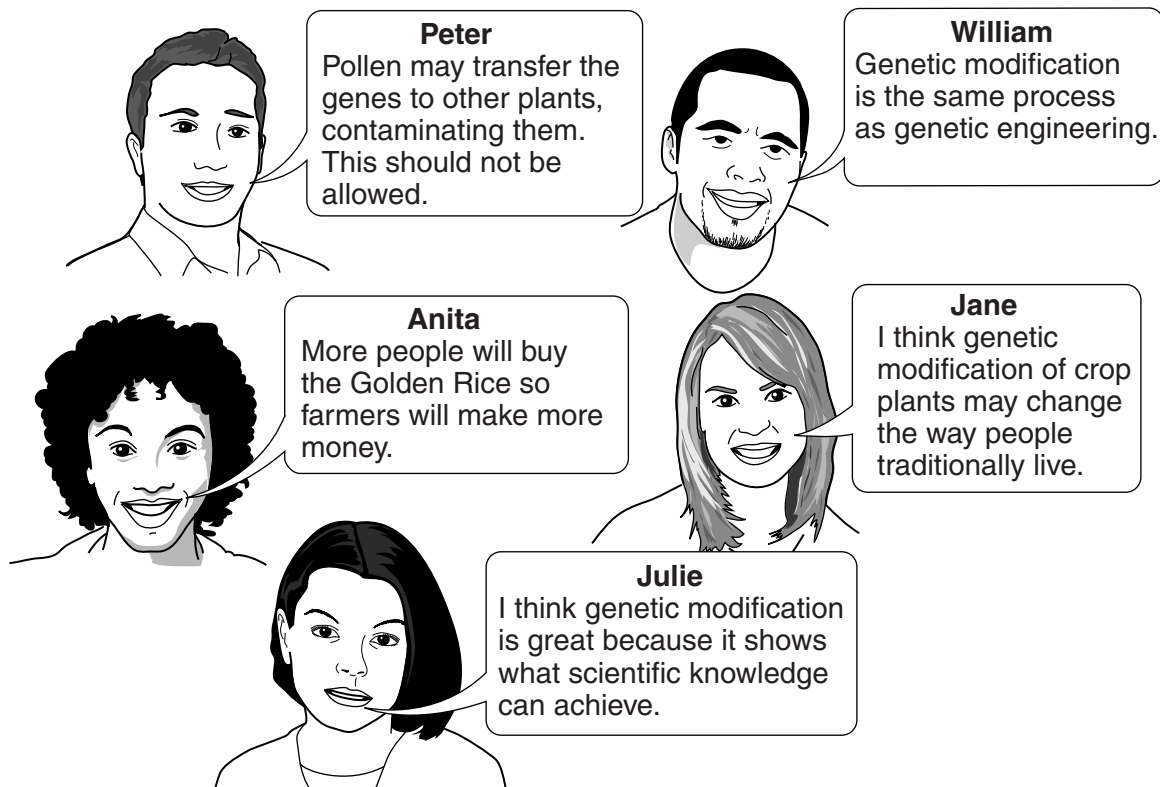
.....

.....

..... [3]

(b) There are ethical, social and economic implications of releasing genetically modified organisms into the environment.

Five people discuss these implications.



(i) Which person is talking about an economic implication?

name [1]

(ii) Which person is talking about a social implication?

name [1]

(iii) Which person is talking about an ethical implication?

name [1]

(c) Which of the following could be examples of genetic modification?

Put ticks (✓) in the boxes next to the **two** correct answers.

discovering a type of fungus that makes a new antibiotic

having identical twins

becoming a blood donor

using bacteria to make the hormone insulin

taking cuttings from plants

making crop plants resistant to disease

[2]

[Total: 8]

- 5 Janine wins a gold medal in a race in the London Olympics.



- (a) Complete the sentences about Janine during the race.

Use words from this list.

respiration photosynthesis energy oxygen protein

bladder carbon dioxide glucose growth heart waste

During the race Janine's muscles need to increase their rate of

..... to provide more

To do this her muscles need more

and

Her contracts faster.

[3]

- (b) Janine's muscles begin to release energy anaerobically.

Complete the word equation for this process.

..... → + energy

[2]

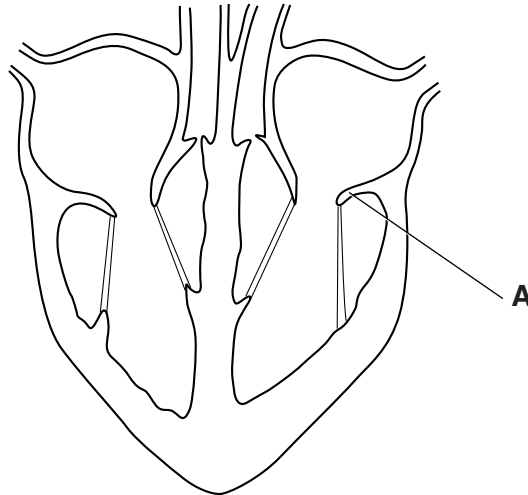
[Total: 5]

6 Humans have a double circulatory system.

(a) Explain what is meant by a double circulatory system.

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

(b) Look at the diagram of the heart.



(i) Name structure **A** and describe its job.

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

(ii) Where else in the circulatory system would you find structures that perform a similar job to structure **A**?

..... [1]

(c) Explain how oxygen is transferred from the blood to the cells in tissues.



One mark is for a clear, ordered answer.

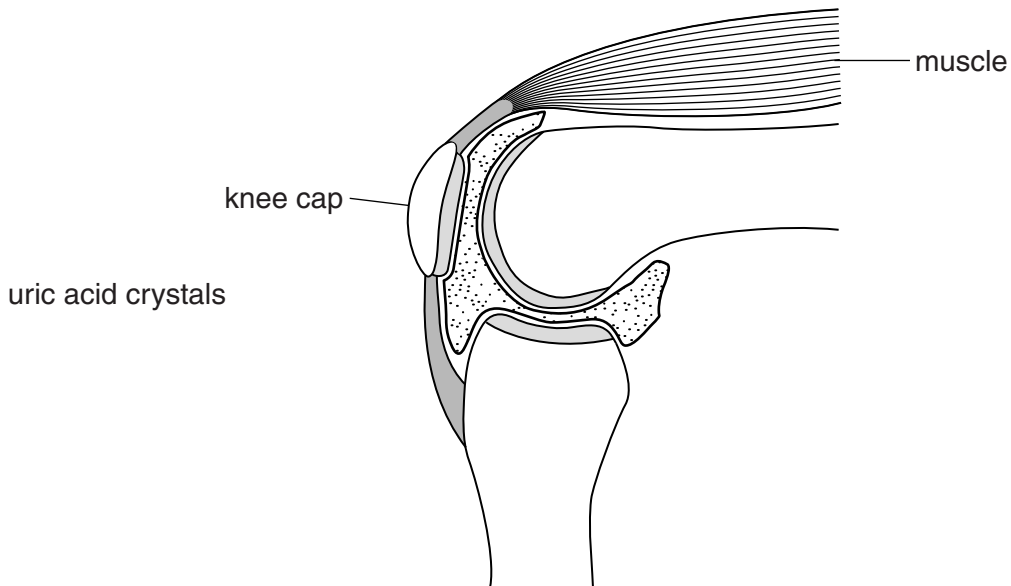
.....
.....
.....
..... [3+1]

[Total: 8]

Turn over

7 James has gout in his knee.

Crystals of uric acid form in the synovial fluid of the joint.



(a) Complete the diagram by drawing a straight line from the **uric acid crystals** label to where the crystals form. [1]

(b) James sees his doctor.

The doctor asks James some questions.

Write down two questions, **one** concerned with James' medical history and **one** concerned with his lifestyle, that the doctor may ask.

medical history

.....

lifestyle

.....

[2]

(c) Explain why the doctor needs this information.

.....

.....

.....

[2]

(d) James has visited the same doctor for the last ten years.

Explain the advantage of regular contact between patients and their doctors.

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

[Total: 6]

END OF QUESTION PAPER

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