OCR
RECOGNISING ACHIEVEMENT

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GENERAL CERTIFICATE OF SECONDARY EDUCATION
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

OCR Supplied Materials:
- Insert (inserted)

Other Materials Required:
- Pencil
- Ruler (cm/mm)

Friday 12 June 2009
Morning

Duration: 1 hour

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- 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.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

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.

OCR is an exempt Charity

Answer **all** the questions.

1 Look at the article '**Wide hips increase risk of breast cancer**'.

Use the information to answer the questions.

(a) (i) The article suggests that **normal term babies** from women with wide hips are at more risk of developing breast cancer.

What is the increased risk of these babies developing breast cancer?

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

(ii) Write down **two** factors in the article, apart from wide hips, that increase the risk even further.

factor 1 .....

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

(iii) Scientists call wide hips a **risk factor** for developing breast cancer.

Explain what is meant by a risk factor.

.....

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

(b) Explain what scientists mean by **intercristal diameter**.

.....

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

(c) Higher levels of oestrogen at certain times during pregnancy are thought to increase the risk of breast cancer.

(i) At what times during pregnancy do these higher levels increase the risk?

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

(ii) What effect do these higher levels of oestrogen have on the developing fetus?

.....

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

(d) Scientists had already discovered that high levels of oestrogen could increase the risk of breast cancer before this study.

How did they discover this?

.....

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

(e) The study used data from more than 6000 women.

Why did the study use such a large number of women?

.....

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

(f) Suggest how this research can be used to reduce the risk of breast cancer in future generations.

.....

.....

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

[Total: 12]

2 Energy is transferred between living organisms in a food web.

Explain how this process happens.

Use the following terms in your answer.

autotrophs **chemical energy** **heterotrophs** **Sun**

.....

.....

.....

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

[Total: 2]

3 Rachael wants to find the percentage (%) of biomass in a soil sample.

This is the data she collected.

	mass in g
soil sample	150
soil after drying at 80°C	140
soil after heating at 200°C	110

Calculate the percentage biomass in Rachael's soil sample of 150 g.

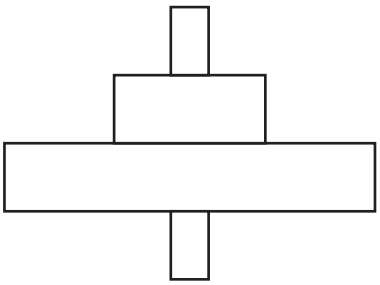
Show your working.

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

[Total: 2]

4 Neil collects data about the feeding of different organisms.

(a) He uses the data to draw two different types of pyramids.



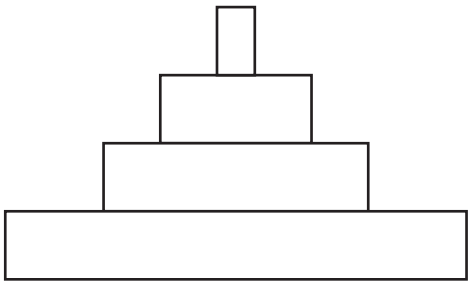
pyramid A

blue tit

ladybird

greenfly

rose bush



pyramid B

Name the two different types of pyramids.

pyramid A.....

pyramid B ..... **[2]**

(b) Describe an **advantage** of using each type of pyramid.

advantage of pyramid A .....

.....

advantage of pyramid B .....

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

[Total: 4]

5 Plants produce food by the process of photosynthesis.

(a) Complete the **word** equation to show this process.

carbon dioxide **+** ..... $\xrightarrow{\text{light energy}}$ glucose **+** .....

[2]

(b) The rate of photosynthesis can be slowed down (limited).

Write down **one** way in which the rate of photosynthesis can be slowed down.

.....

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

(c) The energy transferred by photosynthesis is released in respiration.

This energy can be used by plants to make polymers.

(i) Name a polymer that a plant can make from just glucose.

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

(ii) Name a polymer that can be made from amino acids.

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

[Total: 5]

6 There are different types of relationships between organisms.

One of these is **parasitism**.

(a) Describe this type of relationship.

Use ideas of **benefit** and **harm** in your answer.

.....

.....

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

(b) Read the following piece of homework.

It was written by a student about parasites.

The student's homework contains three incorrect sentences.

> Only animals can be parasites.
>
> Many human diseases are caused by parasites.
>
> Parasites also have a big impact on food production.
>
> Parasites never kill their host.
>
> The parasite always lives inside the host.
>
> The evolution of the parasite is also closely linked to the evolution of the host.

Rewrite the incorrect sentences, correcting the student's errors.

.....

.....

.....

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

[Total: 5]

7 This question is about new technologies.

(a) The diagram shows the structure of a bacterium.

Complete the labels.

Choose from the following words.

chromosome **chloroplast** **membrane** **vacuole** **wall**

[3]

(b) Bacteria and fungi can be grown in large scale fermenters.

Write down **two** different products that can be made using fermenters.

1 .....

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

(c) Plants can be genetically modified.

Some genetically modified plants have been released into the environment.

There are implications for releasing genetically modified organisms into the environment.

Some of the implications are **economic**, some are **social** and some are **ethical**.

Look at the following statement.

- Some people think that we should not alter an organism's DNA under any circumstances.

Which of these three implications applies to this statement?

Explain your answer.

.....

.....

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

[Total: 7]

8 Respiration is the process by which we release energy from our food.

(a) Write down what change happens to muscle cells when they are provided with energy.

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

(b) Working muscle cells need more oxygen and glucose.

Explain how they get more oxygen and glucose.

Use ideas about breathing rate and heart rate in your answer.

One mark is for a clear, ordered answer.

.....

.....

..... **[2+1]**

(c) Muscles can also use **anaerobic** respiration.

Complete the word equation for anaerobic respiration in muscle cells.

Choose words from this list.

carbon dioxide **glucose** **lactic acid** **oxygen** **water**

..... ⟶ ..... **+ energy**

[2]

(d) Aerobic respiration is different from anaerobic respiration.

Write down **one** way that it is different.

.....

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

[Total: 7]

9 Look at the picture of human blood.

(a) Complete the labels to show what job each part does.

Choose from this list.

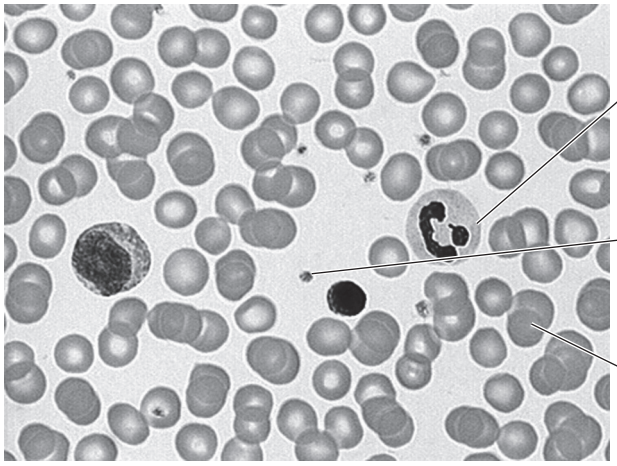
releases energy

transports oxygen

transmits nerve impulses

controls infection

clots blood



[3]

(b) Nina's blood group is AB.

Five different students were asked to explain what this means.

These are their answers. Some are correct and some are not.

Nina has ...

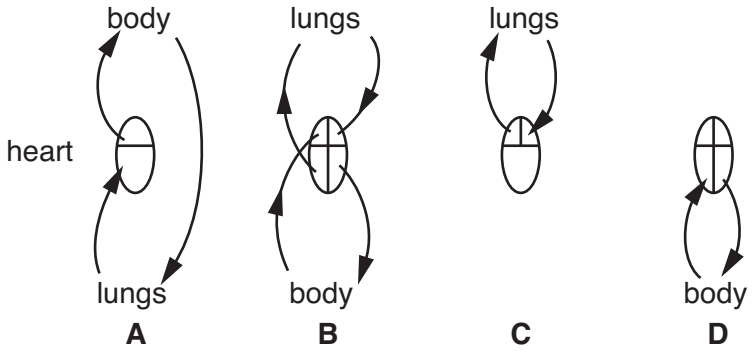
... AB antibodies on her red blood cells.
... no AB antibodies in her plasma.
... AB antigens in her plasma.
... no AB antigens on her red blood cells.
... AB antigens on her red blood cells.

Use the answers to help you explain what being blood group AB means.

.....

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

(c) Nina has a double circulatory system, like all mammals.



Which of the diagrams, **A**, **B**, **C** or **D**, shows Nina's double circulatory system?

answer .....

Explain your answer.

.....

.....

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

[Total: 7]

10 Ann sprains her elbow.

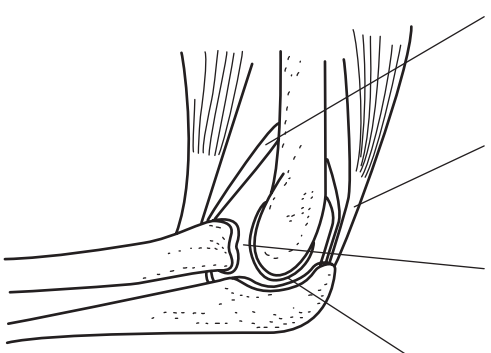
(a) Look at the picture of her elbow joint.

Complete the labels to show what each part does.

Choose from this list.

holds two bones together **lubricates joint**

prevents bones rubbing together **attaches muscle to bone**



ligament .....

.....

tendon .....

.....

synovial fluid .....

.....

cartilage .....

.....

[2]

(b) The nurse took details of Ann's medical history when she was treated in hospital.

(i) State one piece of information about Ann's medical history that the nurse would write down.

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

(ii) Explain why this piece of information is needed.

.....

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

[Total: 4]

END OF QUESTION PAPER