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)

FRIDAY 12 JUNE 2009: 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 (SLM/CGW) OV90851 11345

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, 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.

BLANK PAGE

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) At certain times during the pregnancy, higher levels of oestrogen 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) Before this study, scientists had already discovered that high levels of oestrogen could increase the risk of breast cancer.

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.

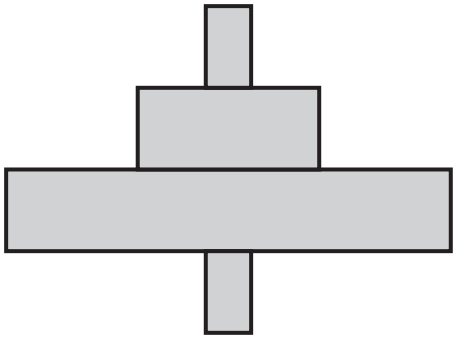
Show your working.

_____ % [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.



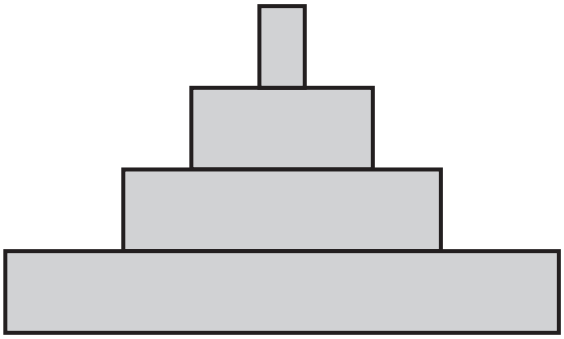
pyramid A

blue tit

ladybird

greenfly

rose bush



pyramid B

Name the two different types of pyramids.

pyramid A _____

pyramid B _____ [2]

(b) Describe an <u>ADVANTAGE</u> 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 This question is about human blood.

(a) (i) What job does a white blood cell do? Choose your answer from releases energy, transports oxygen, transmits nerve impulses, controls infection, clots blood.

_____

(ii) What job does a platelet do? Choose your answer from releases energy, transports oxygen, transmits nerve impulses, controls infection, clots blood.

_____

(iii) What job does a red blood cell do? Choose your answer from 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 ...

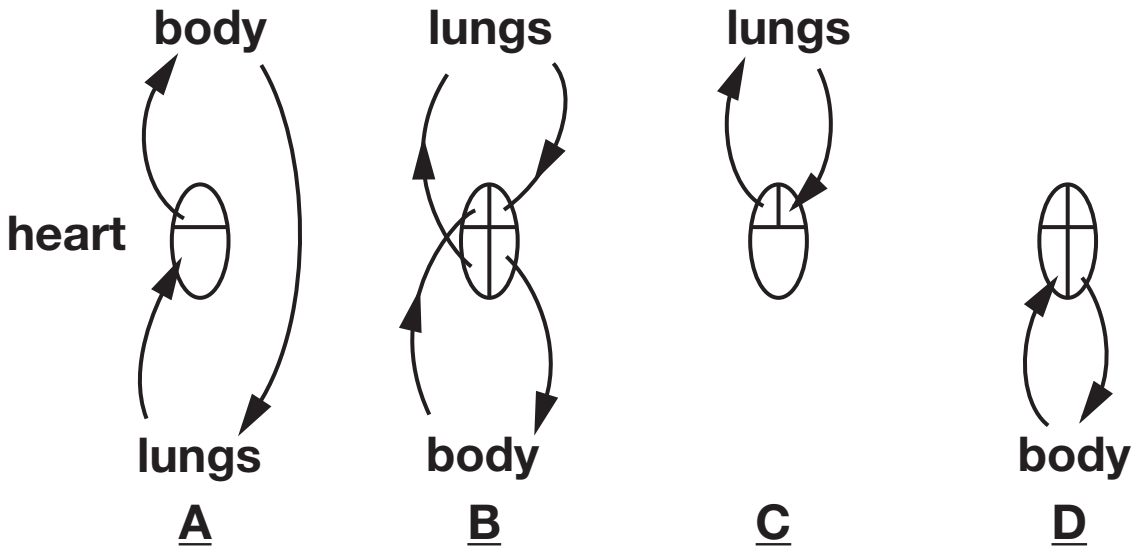
... AB antibodies on her red blood cells.
... no AB antibodies in her plasma.
... AB antigens in her plasma.
... no AB antigens on her red blood cells.
... AB antigens on her red blood cells.

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

_____

_____ [2]

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



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.

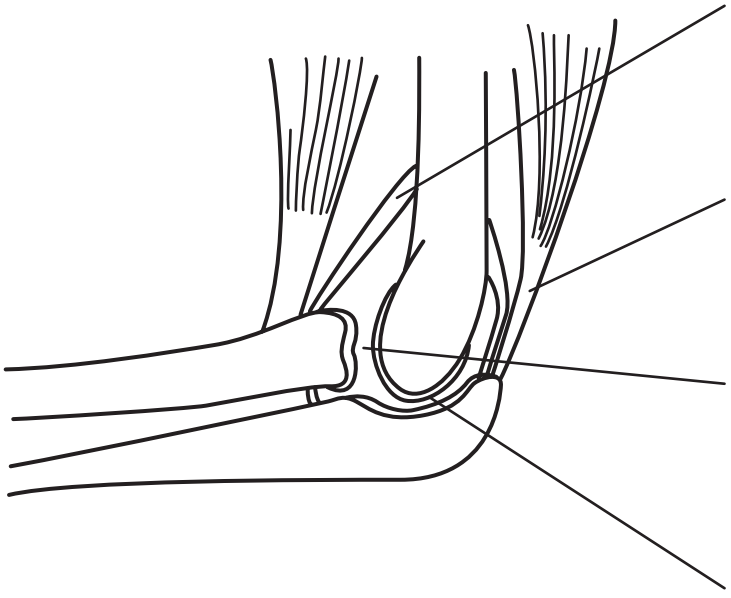
Choose from this list.

HOLDS TWO BONES TOGETHER

LUBRICATES JOINT

PREVENTS BONES RUBBING TOGETHER

ATTACHES MUSCLE TO BONE



ligament _____

_____

tendon _____

_____

synovial fluid _____

_____

cartilage _____

_____

[2]

(b) When Ann was treated in hospital, the nurse took details of Ann's medical history.

(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