

Surname	Centre Number	Candidate Number
Other Names		0



GCSE

0235/01

**SCIENCE
FOUNDATION TIER
BIOLOGY 1**

A.M. TUESDAY, 24 January 2012

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	8	
2	8	
3	6	
4	6	
5	7	
6	6	
7	4	
8	5	
TOTAL	50	

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

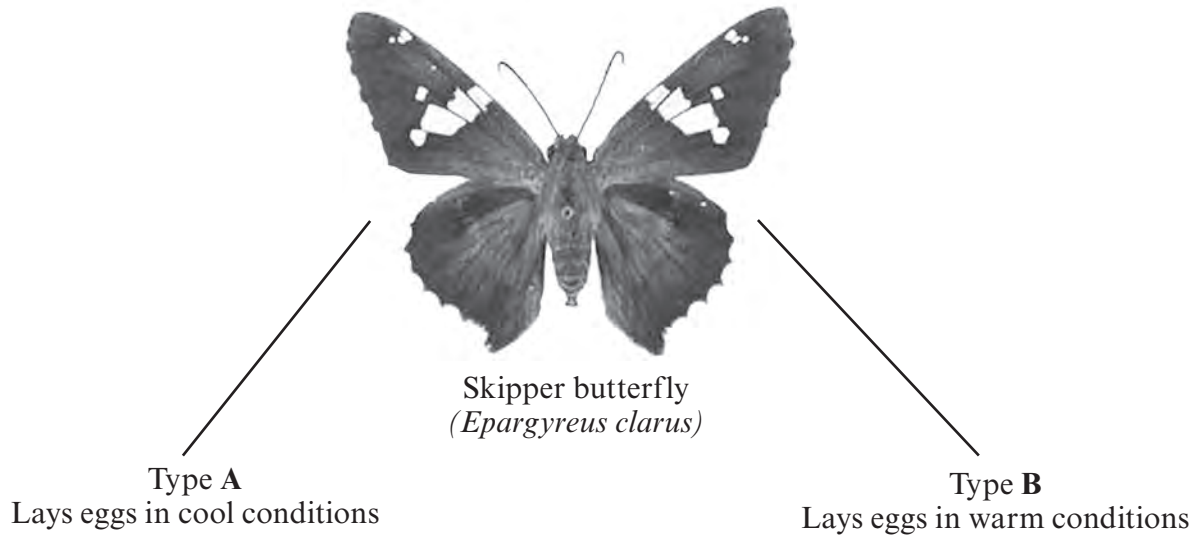
The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

Answer **all** questions.

1. Read the following information about butterflies and climate change.

- Skipper butterflies live in England and Wales.
- There are two types, A and B, as in the diagram below.

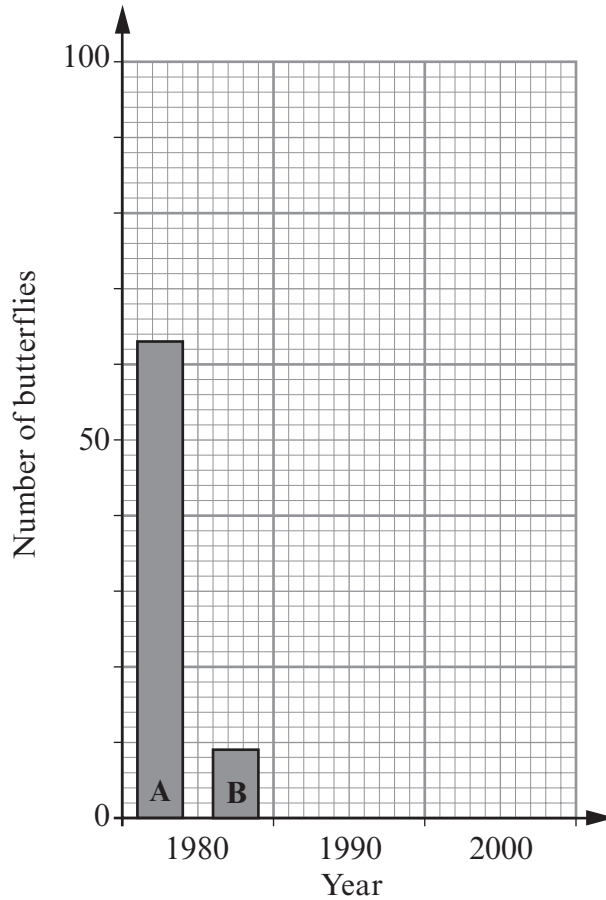


- Scientists counted butterflies between 1980 and 2000 in an area. The results are shown below. During this time the temperature of the environment increased because of global warming.

Results

		Number of butterflies		
Type	1980	1990	2000	
A	63	38	14	
B	9	43	77	

- (a) (i) Complete the bar chart to show the results for 1990 and 2000. Label your bars **A** and **B**. [2]



- (ii) From this information, between 1980 and 2000:
- I. state what has happened to the number of type **A** butterflies; [1]
.....
 - II. suggest a reason for the change in numbers shown in type **B**. [1]
.....

- (b) The scientists said that the Skipper butterfly had shown *natural selection*. [3]

Complete the sentences using some of the words below.

generation survive species genes

During natural selection some individuals better than others.

They breed and so pass on their to the next

.....

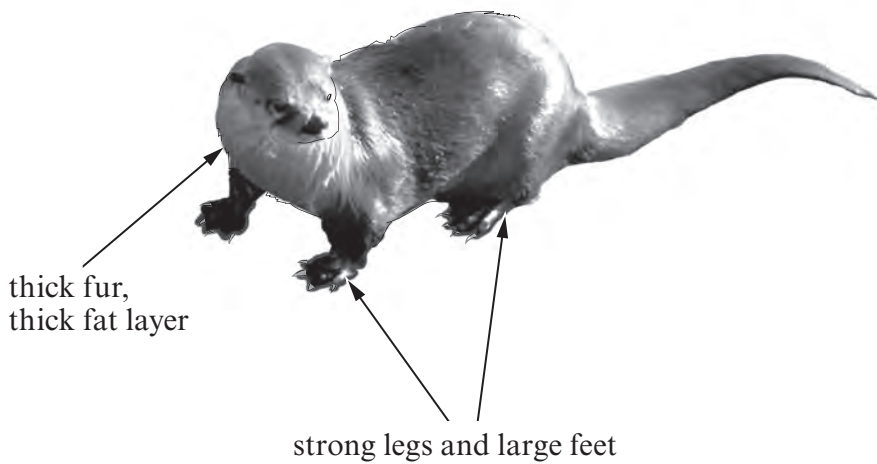
- (c) The Mountain Ringlet is a species of butterfly which can only survive in a cool environment. Suggest what might happen to this species if global warming continues. [1]

.....

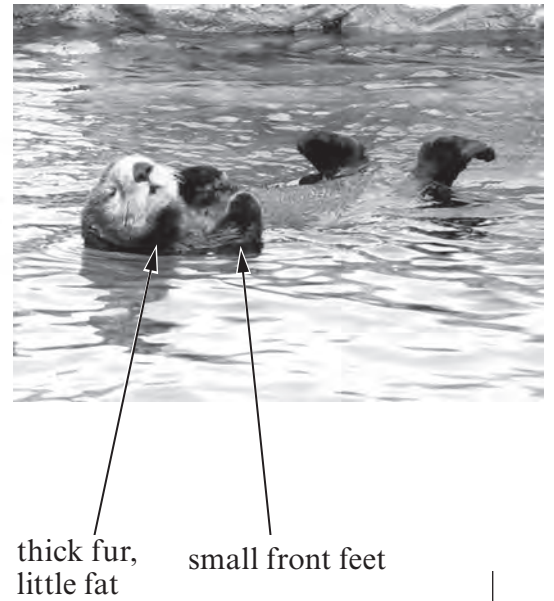
2. Use the information about otters in the photographs and table to answer the questions that follow.

- Otters are adapted to life in and near water.
- There are two types of otter.

River Otter



Sea Otter



Otter facts

Feature	River Otter	Sea Otter
Time spent in water (%)	50	90
Swimming speed (kilometres per hour)	15.0	9.3
Swimming method	All feet used	Only back feet used
Maximum time underwater (minutes)	8	4
Level of heat produced in body	Very high	Medium
Food	Fish	Fish
Depth of diving	Shallow	Very deep

From **this information**:

(a) (i) How much faster does a River Otter swim than a Sea Otter? [1]

..... kilometres per hour

(ii) Both otters are streamlined. Suggest why the River Otter is able to swim faster. [1]

.....

(b) (i) Sea Otters can move only slowly on land. Why is this *not* a problem for them? [1]

.....

(ii) From the photograph, give **one** feature of the River Otter that allows it to move quickly on land. [1]

.....

(c) Give **two** reasons why the Sea Otter has more difficulty in keeping warm than the River Otter. [2]

(i)

(ii)

(d) For each otter, suggest **one** feature which helps it to find as much food as possible. [2]

River Otter

Sea Otter

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3. • Cystic fibrosis is a condition in which thick mucus collects in the lungs. It is inherited when genes are passed from parents to a child.
- Different forms of a gene are called *alleles*.

(a) (i) Complete the sentence using **one** of the words below. [1]

heterozygous dominant mutant

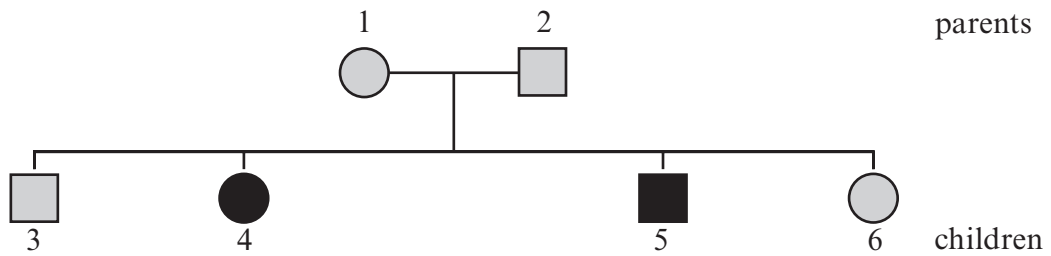
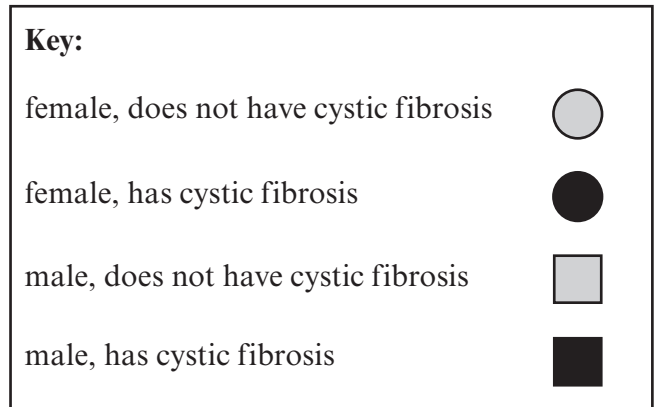
The allele for cystic fibrosis is recessive and the normal allele is

(ii) Complete the table below. [1]

n = Cystic fibrosis allele. N = normal allele

Alleles present	Does the person have cystic fibrosis? (yes or no)
NN	
Nn	
nn	yes

(b) The diagram shows a family tree.



From the family tree:

- (i) Give a number for
- a healthy male;
 - a female with alleles nn;
 - a person whose alleles are Nn. [3]
- (ii) In *this family* what proportion of children have cystic fibrosis? [1]
 Circle the correct answer.
- 25% 50% 75% 100%

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4. Read the following information about food and health.

Contents of processed foods

	Savoury Pie 100 g (highly processed)	Baked Beans 100 g (less processed)
Energy (kJ)	950.0	300.0
Fat (g)	9.2	0.2
Salt (g)	4.8	1.7
Fibre (g)	3.8	3.8

Illnesses linked to bad diet.

Diet	Health risk
High fat	Heart disease
High salt	Stroke Kidney damage in young children
Low fibre	Bowel cancer

(a) From **the tables**

- (i) State **two** health risks which are greater for an adult eating Savoury Pie every day, than for an adult eating baked beans. Give reasons. [2]

I. Risk 1

Reason

II. Risk 2

Reason

- (ii) Why is a diet of highly processed food not suitable for young children? [1]

.....

- (iii) The energy Geraint needs for one hour of work is 150 kJ. He eats 200 g of baked beans for lunch.

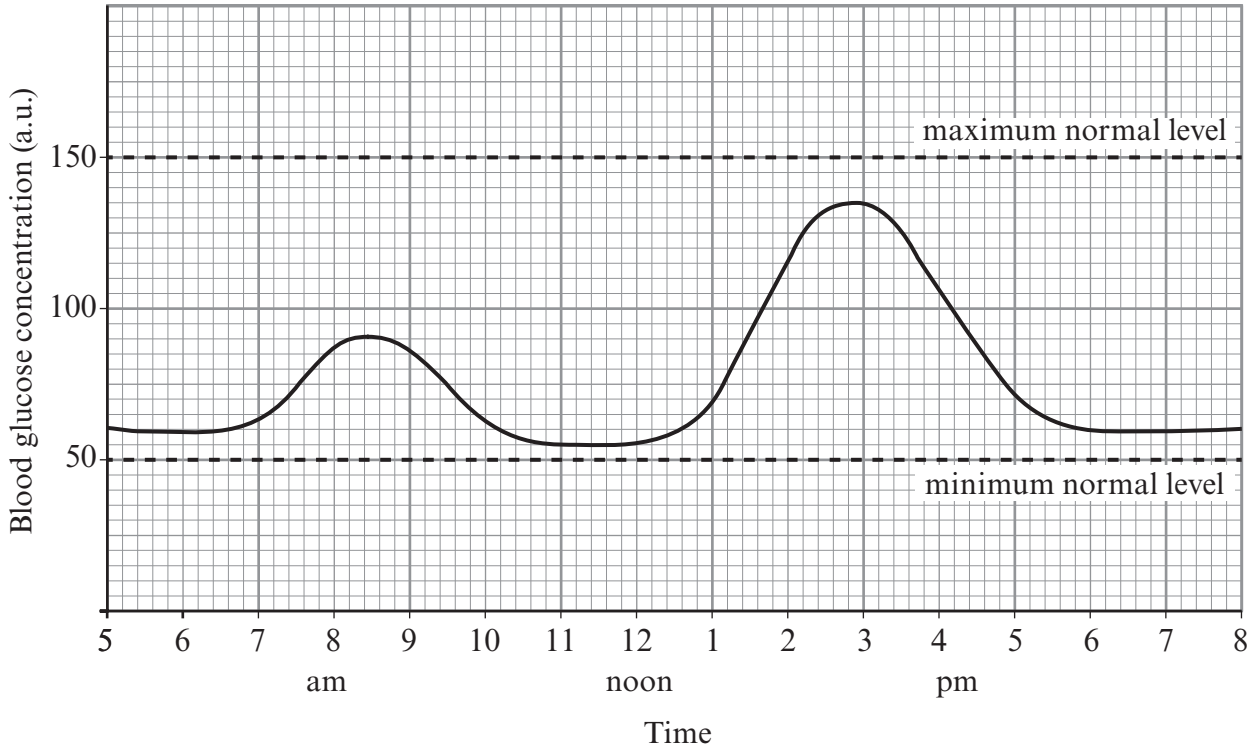
Calculate how long he could work in the afternoon using this energy. Show your working. [2]

..... hours.

- (b) What health problem, not given in the tables, occurs if a person takes in too much energy and does too little exercise over a long period of time? [1]

.....

5. (a) The graph shows the level of glucose in a person's blood during one day.



From the graph:

(i) Complete the sentence by underlining the correct answer. [1]

The level of glucose in the blood needs to be

at a constant high level

at a steady low level

within a certain range.

(ii) What happens to the level of blood glucose between 7.00 am and 10.00 am? [1]

.....

(iii) Suggest a reason for the change in blood glucose level between 12.30 and 2.30 pm. [1]

.....

(b) A medical condition occurs if a person does not produce enough of the hormone which controls the level of blood glucose.

(i) Name the hormone. [1]

.....

(ii) Name the medical condition. [1]

.....

(iii) A doctor can do a test to find out if a patient has this condition. Circle the correct answers below about the test. [2]

I. Which fluid is taken from the patient?

sweat urine saliva

II. Which substance does the doctor look for in the fluid?

salt protein glucose

6. John and Tracey are a young couple who each smoke 25 cigarettes a day on average. They have both tried to stop smoking many times without success.

(a) Why do John and Tracey find it so difficult to stop smoking? [1]

(b) Suggest **two** reasons why John and Tracey should wish to stop smoking. [2]

(i)

.....

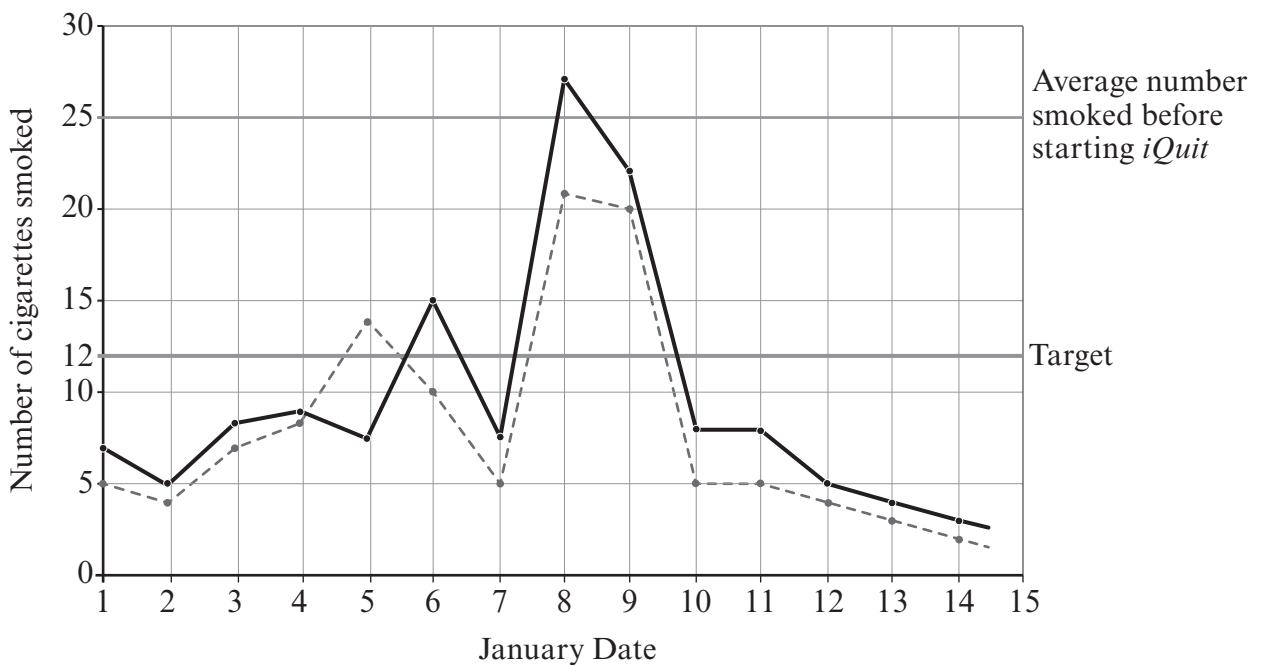
(ii)

.....

(c) Both John and Tracey downloaded an ‘iQuit Smoking’ App to their mobile phones. Using this App they input the maximum number of cigarettes they wish to smoke in a day - the target - and also the **actual** number of cigarettes they smoke each day. The App then produces a graph of the progress made in attempting to stop smoking.

The graph below shows the data from John and Tracey’s first 2 weeks of this attempt at stopping smoking.

iQuit Smoking progress chart



Key:
 ---- John
 ——— Tracey

(i) For how many days did John smoke more than his target number of cigarettes? [1]

..... days.

(ii) Use the graph to explain why John and Tracey’s attempt at stopping smoking has been a success so far. [2]

.....

.....

.....

.....

7. The European adder (*Vipera berus*) is a snake found in many parts of Wales. The body colour is usually brown, cream or red with a dark zig-zag pattern along the back.

European adder



- (a) What word is used to describe the differences between members of the same species? [1]

.....

- (b) Adders whose colour is all black are seen occasionally.

- (i) What word is used to describe this sudden change in colour? [1]

.....

- (ii) What chemical is altered to cause this change in colour? [1]

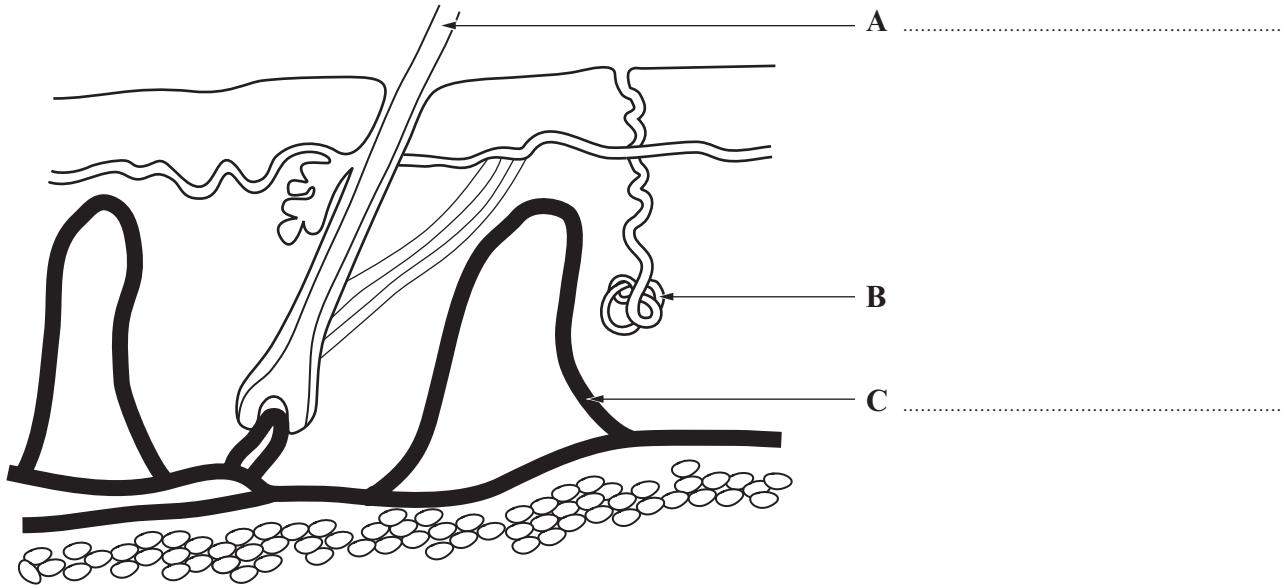
.....

- (c) State **one** way the offspring produced by sexual reproduction differ from those produced by asexual reproduction. [1]

.....

.....

8. The diagram shows a section through human skin.



(a) Label parts **A** and **C** on the diagram. [2]

(b) When the body temperature rises, explain how part **B** helps to lower it. [3]

.....
.....
.....
.....
.....
.....