



Centre Number

71	
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Candidate Number

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General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

MV18

TUESDAY 13 MAY 2014, MORNING

TIME

1 hour, plus your additional time allowance.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.

Answer **all nine** questions.

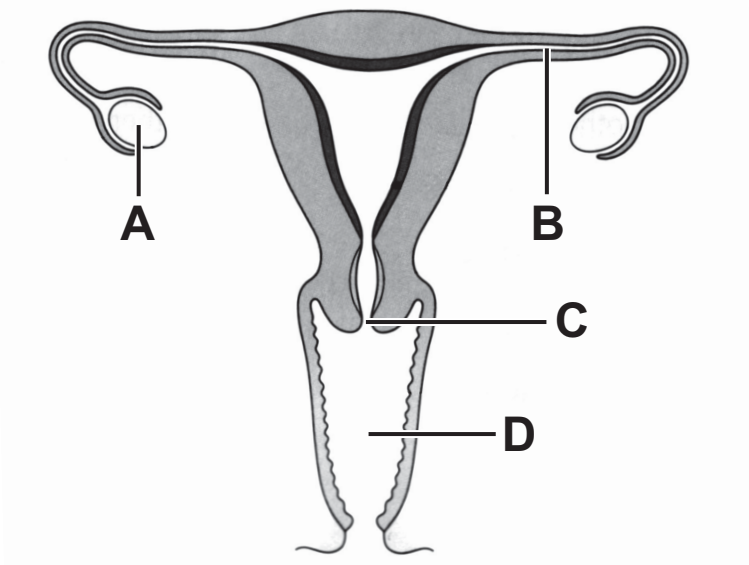
INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question **9**.

1 The diagram below shows the female reproductive system.



(a) (i) Complete the table below by placing the correct letter beside the name of each part. One letter will not be used. [3 marks]

Name	Letter
Ovary	
Cervix	
Oviduct	

(ii) On the diagram place an **X** in the part where the baby grows. [1 mark]

(b) (i) Given below are two methods of contraception. Using lines, link each method to how it prevents pregnancy. [2 marks]

Method

How method prevents pregnancy



Stops sperm entering female

Stops the baby growing



Changes the hormone levels in females and prevents an egg being released

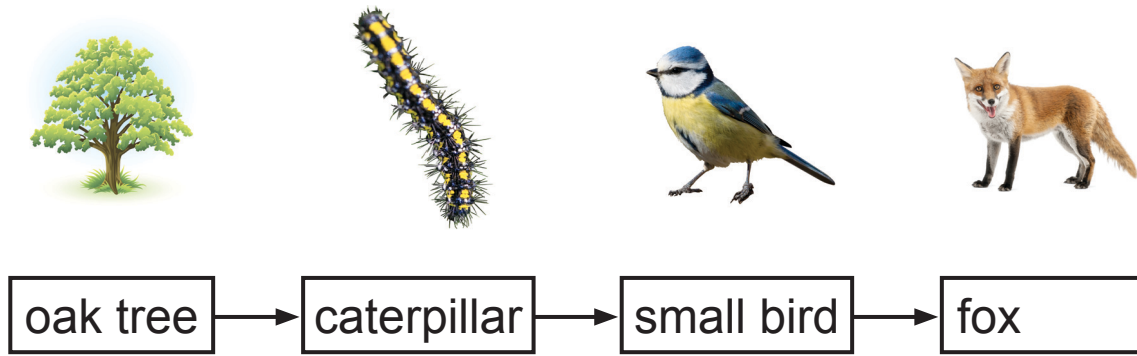
(ii) Name a method of contraception which will help prevent infection by a sexually transmitted disease. [1 mark]

(iii) In a vasectomy operation, which part of the male reproductive system is cut? [1 mark]

Choose from:

penis : sperm tubes : prostate gland

2 Shown below is a food chain.



(a) (i) What do the arrows in a food chain tell us? [1 mark]

(ii) What is the source of energy for all food chains? [1 mark]

(b) The table below shows the numbers of each animal in a small area over three years.

Year \ Animal	Caterpillar	Small bird	Fox
2006	600	250	6
2007	400	320	3
2008	200	580	1

(i) Suggest **one** problem in counting the number of animals. [1 mark]

(ii) State the trend shown by the number of foxes and small birds over the three years. [1 mark]

(iii) Suggest an explanation for the change in the number of small birds. [1 mark]

3 (a) Complete the following sentences about drugs. [3 marks]

Choose from:

relaxed **mental** **antibiotics**

addictive **cocaine**

Drugs can change the physical or _____
state of people. Cannabis and _____ are two
illegal drugs which people take. Cannabis when taken
can create a _____ mood.

(b) Mark is 25 years old and he drinks alcohol regularly.
Anna who is the same age never drinks alcohol.

The diagram below shows the discussion they had
about the effects of alcohol.

I am a very outgoing person who
can talk to anyone. I do not like what
alcohol can do to you.



Anna



Mark

When I go out with my
friends at weekends, I feel
pressure to drink alcohol. It
makes me more able to talk
to people. My mates say I
am a real 'binge drinker'.

(i) What is meant by the term 'binge drinking'? [1 mark]

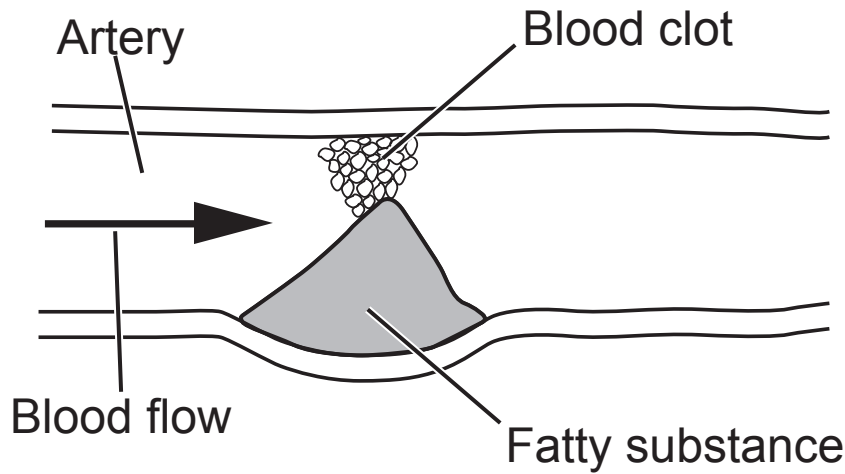
(ii) State **one** harmful effect of alcohol on society.
[1 mark]

(iii) Using the information provided, explain why Mark drinks alcohol but Anna does not drink alcohol.
[2 marks]

Mark _____

Anna _____

- 4 The diagram below shows an artery that has narrowed because of a build-up of a fatty substance.



- (a) Name the fatty substance in the diagram that builds up in the artery causing it to narrow. [1 mark]

Choose from:

cholesterol

sugar

fibre

- (b) Using the diagram above and your knowledge, suggest what might happen if the fatty substance is blocking an artery leading to the muscle that makes the heart beat. [2 marks]

- (c) The Public Health Agency has launched a campaign to encourage people to reduce their waist size by making some lifestyle changes.
Increasing waist size can lead to an increase in the risk of heart disease and diabetes.

Increasing the amount of exercise is one lifestyle change they suggest.

- (i) Give one other **lifestyle** change that we could make to help reduce our risk of developing heart disease.
[1 mark]
-

Diabetes is a condition in which the body is unable to control blood glucose levels.

- (ii) Give **two** long term effects of diabetes. [2 marks]

1. _____
2. _____

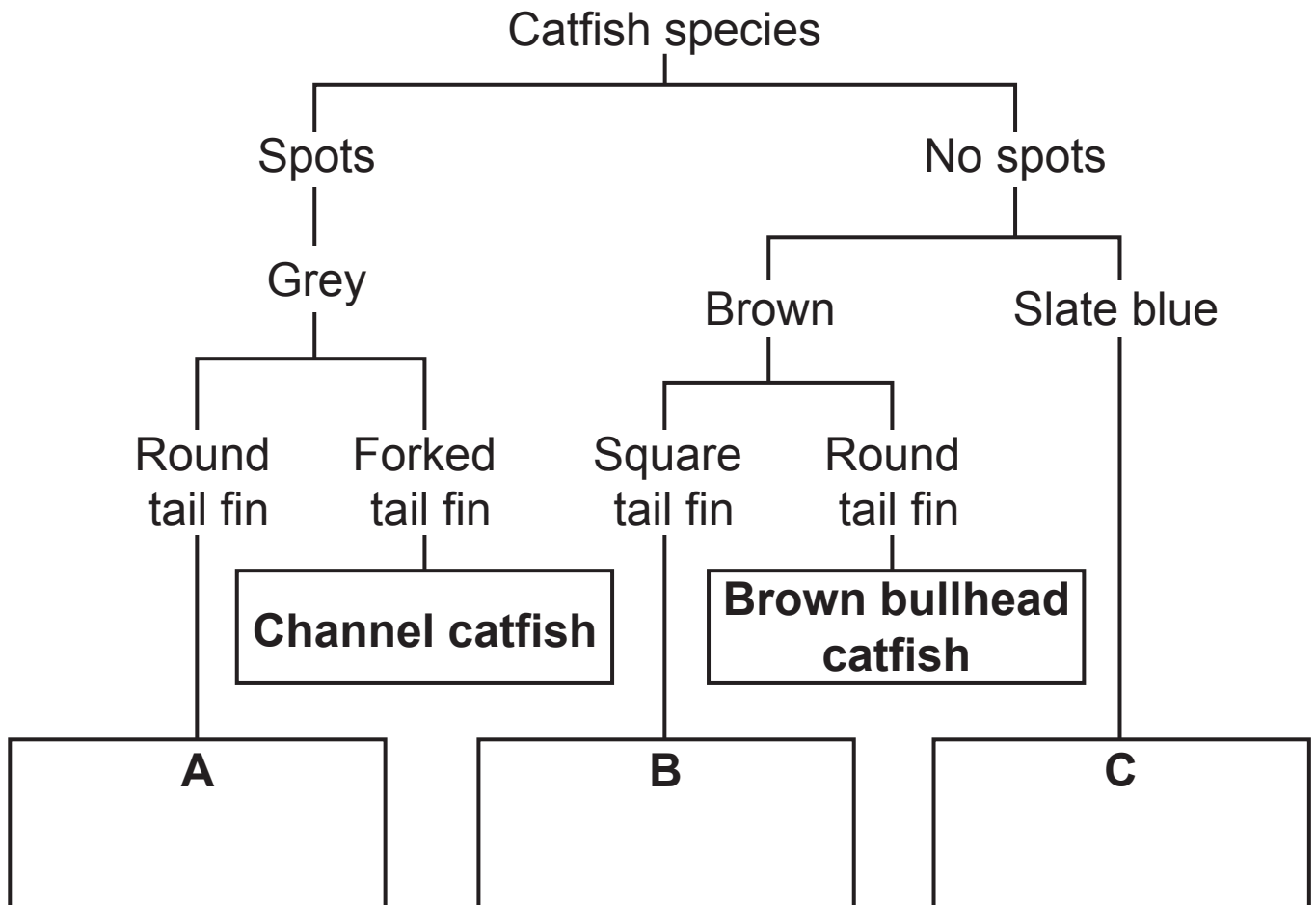
- (iii) Suggest **two** reasons why the treatment of diabetes is very expensive. [2 marks]

1. _____
2. _____

5 Some features of five species of catfish are shown in the table below.

Species of catfish	Colour	Tail fin shape	Spots
Channel	Grey	Forked	Yes
Blue	Slate blue	Forked	No
Flathead	Brown	Square	No
Brown bullhead	Brown	Round	No
Walking	Grey	Round	Yes

(a) Identify the catfish species **A**, **B** and **C** using the information in the table and the key. [2 marks]



(b) The walking catfish is native to Asia but was introduced to Florida and within 10 years had spread to 20 counties. It can breathe air when out of water and using spiny front fins ‘walk’ from pond to pond, where it feeds on fish. The walking catfish is known as a competitive invasive species.

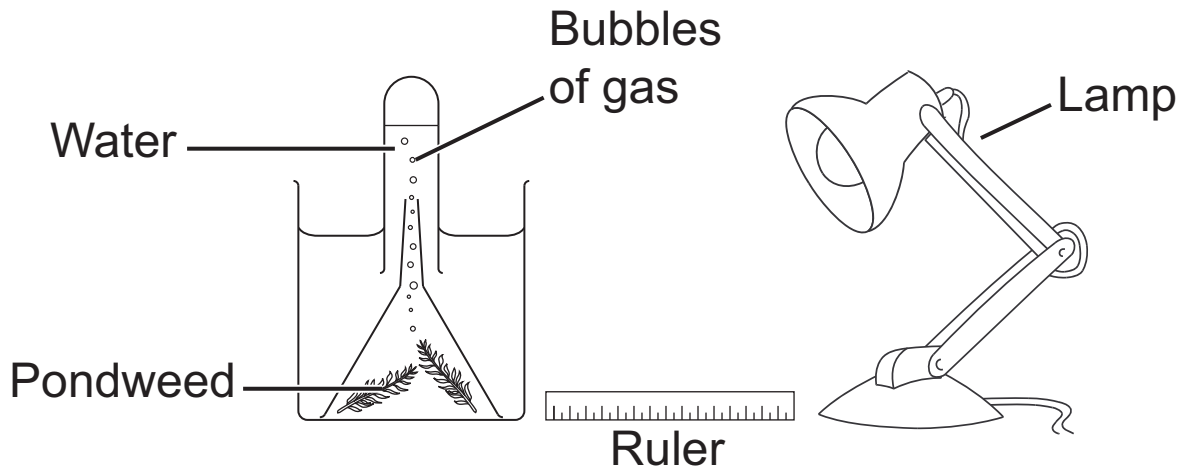
Using this information and your knowledge, answer the questions below.

(i) Give **two** adaptations of the walking catfish that allow it to spread quickly. [2 marks]

1. _____
2. _____

(ii) Apart from spreading quickly, give **two** other features of all ‘competitive invasive species’. [2 marks]

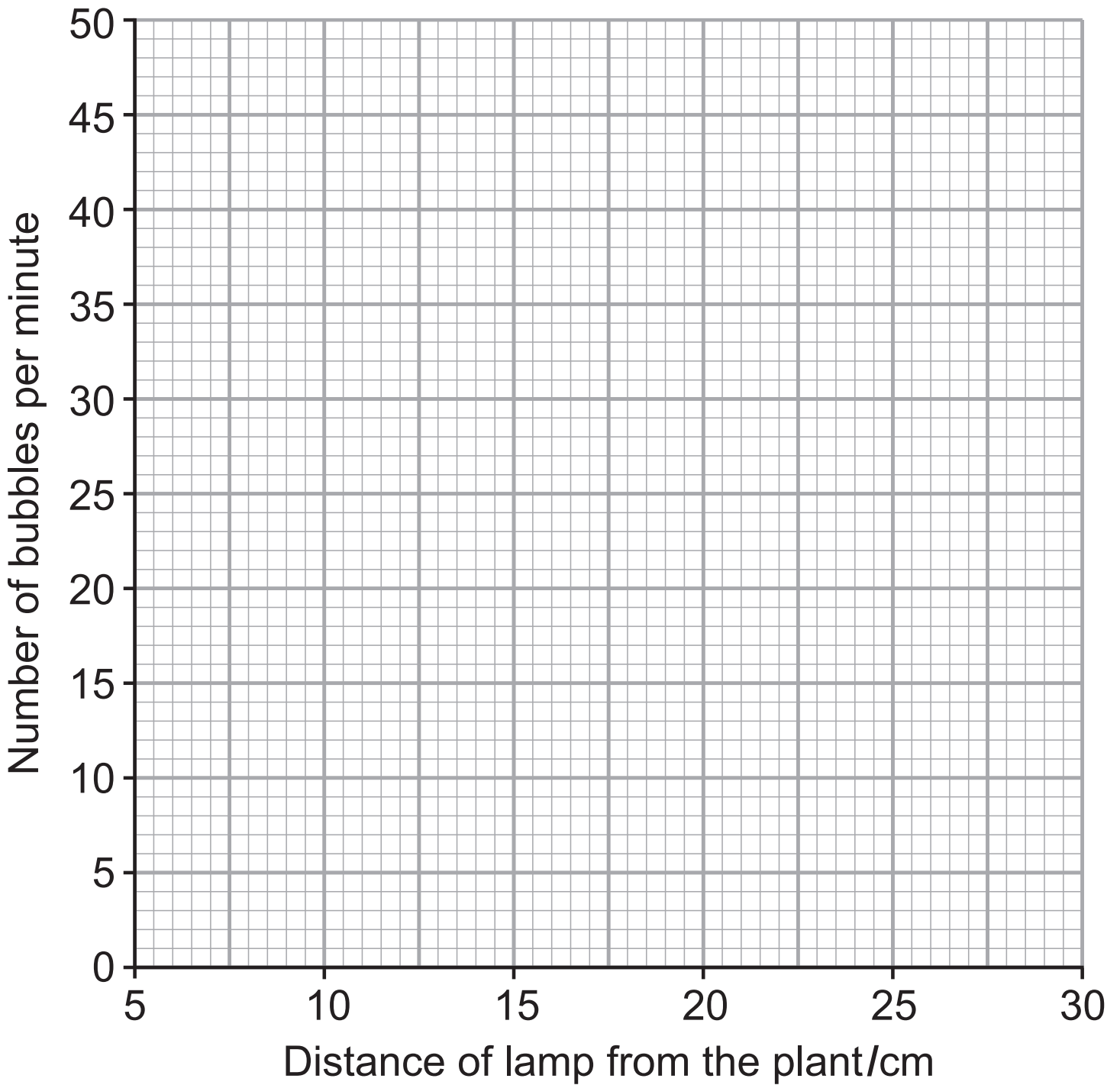
- 6 The following experiment was set up to investigate the effect of light intensity on photosynthesis. The lamp was set at different distances from the plant and the number of bubbles of gas per minute was counted.



The results of the experiment are shown below.

Distance of lamp from the plant/cm	Number of bubbles per minute
5	50
10	45
15	36
20	20
25	8
30	8

(a) Use these results to plot a line graph on the grid below.
[3 marks]



(b) (i) Name the gas produced during this experiment.
[1 mark]

(ii) Describe and explain the results of this investigation.
[3 marks]

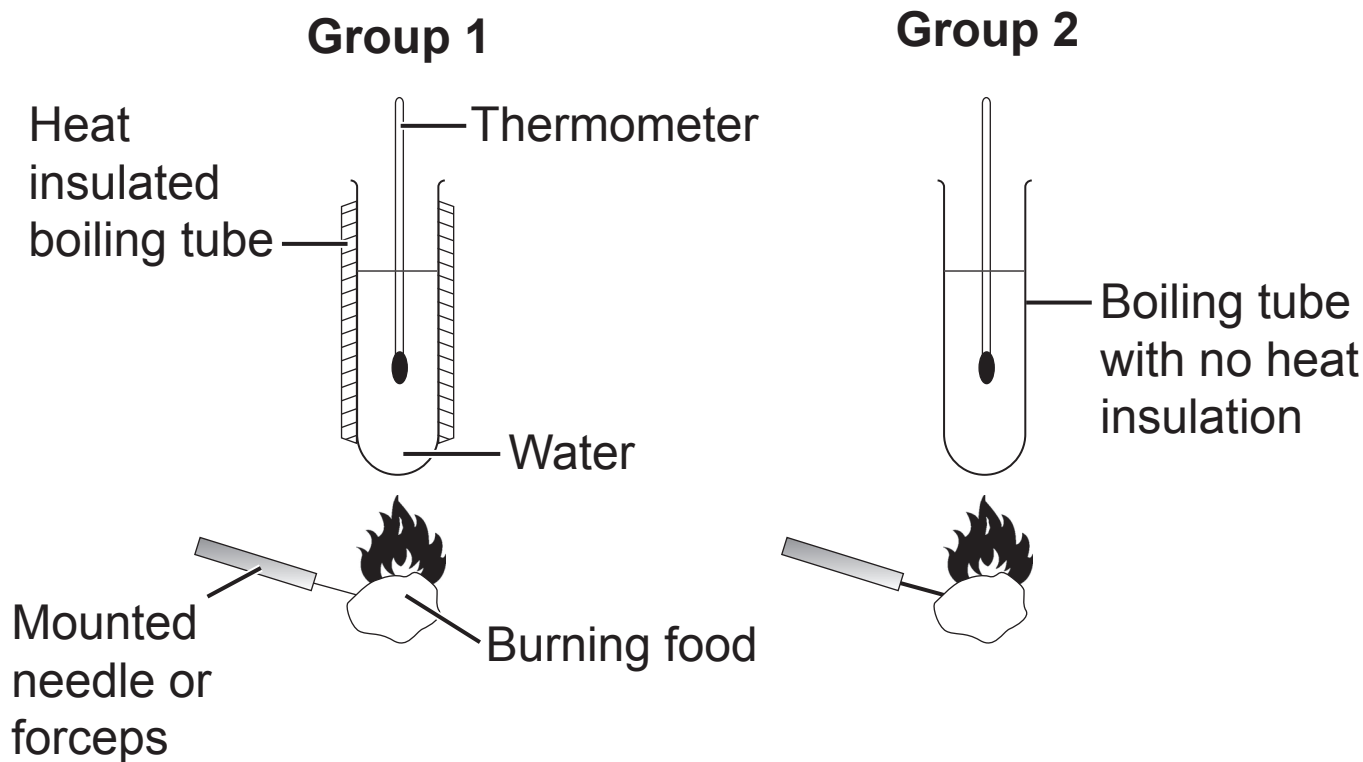
(c) In order to get the most light a plant will often grow in the direction of the sunlight.

What is this response to light called? [1 mark]

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(Questions continue overleaf)

- 7 The energy content of food was investigated by two groups each using a different method as shown below. The methods were identical except Group 1 used a heat insulation material.



The results are shown below and opposite but two values are missing.

- (a) Complete the **two** missing values in the tables.
[2 marks]

Group 1

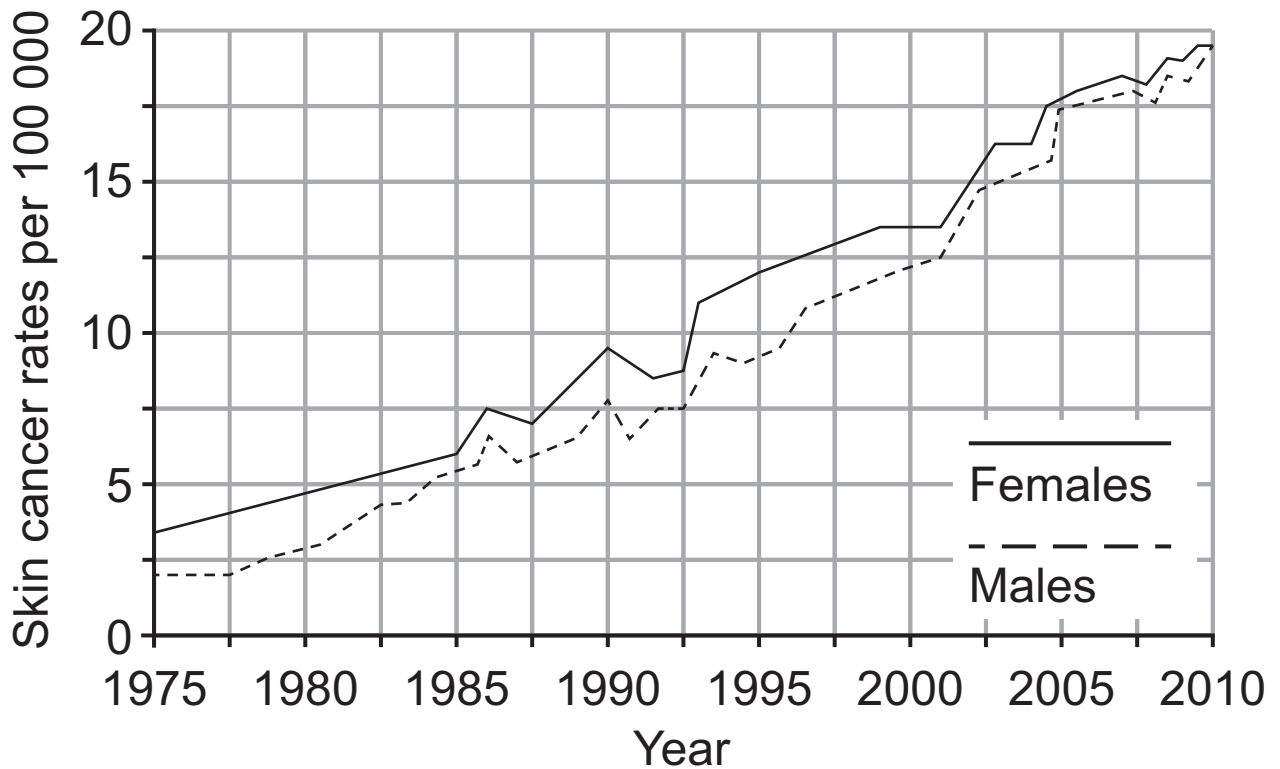
Food	Temperature at the start/ $^{\circ}\text{C}$	Temperature at the end/ $^{\circ}\text{C}$	Temperature rise/ $^{\circ}\text{C}$
bacon	18	64	46
crisps	18	52	34
biscuit	18	42	

Group 2

Food	Temperature at the start/°C	Temperature at the end/°C	Temperature rise/°C
bacon	18	54	36
crisps	18		26
biscuit	18	36	18

(b) Using the information provided, explain fully why the temperature rises obtained by Group 2 were lower than that obtained by Group 1. [2 marks]

- 8 (a) The graph below shows the skin cancer rates (number per 100 000) in the UK between 1975 and 2010.



- (i) State **two** conclusions that can be made from the information provided. [2 marks]

1. _____

2. _____

A new law in England and Wales bans people under 18 from using sunbeds.



(ii) Describe and explain the effect this new law may have on the rates of skin cancer over the next ten years. [2 marks]

(b) The table below shows how the age of a mother affects the risk of having a Down syndrome child.

Age of mother/years	Risk of having a child with Down syndrome
25	1 in 1350
30	1 in 940
35	1 in 350
40	1 in 85
45	1 in 35
50	1 in 10

A test can be carried out to see if a child has Down syndrome before it is born. However, there is a 1% (1 in 100) risk of a miscarriage (loss of baby) with this test.

(i) Using the information provided, explain fully why this test is normally only offered to mothers over the age of 35 and not offered to mothers aged under 35 years. [2 marks]

(ii) Apart from the risk involved, suggest **one** other factor that may influence a mother's decision whether to take the test or not. [1 mark]

(c) Skin cancer and Down syndrome are both caused by a change to genetic material in body cells. Give the general name that describes a change to genetic material. [1 mark]

- 9 A completely new and unusual antibiotic has been extracted from a marine microorganism found in California.

Describe the stages this new antibiotic would have to go through before it can safely be prescribed by doctors.

[6 marks]

Your account should include:

- the names of each stage and what is involved
- the reasons for each stage
- one ethical issue involved

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

THIS IS THE END OF THE QUESTION PAPER

Sources

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Page 3, Question 1b(i)y Photograph of a condom, © zagorskid/ iStock/Thinkstock

Page 4, Question 2a Image of an oak tree, © LoopAll/iStock/Thinkstock

Page 4, Question 2b Photograph of a caterpillar, © Ingram Publishing/Thinkstock

Page 4, Question 2c Photograph of a small bird, © JensGade/iStock/Thinkstock

Page 4, Question 2d Photograph of a fox, © GlobalP/iStock/Thinkstock

Page 18, Question 8a(i) Graph showing skin cancer rates in the UK between 1975 and 2010, Adapted from: © Cancer Research UK
<http://www.cancerresearchuk.org/cancer-info/cancerstats/types/skin/incidence/uk-skin-cancer-incidence-statistics> 2013

Page 19, Question 8a(ii) Photograph of a sun bed, © Boris Kaulin/iStock/Thinkstock

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Question Number	Marks
1	
2	
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Total Marks	

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