



General Certificate of Secondary Education
2014

Double Award Science: Biology

Unit B2

Foundation Tier

[GSD41]

FRIDAY 6 JUNE 2014, AFTERNOON

Centre Number

71

Candidate Number

ML

TIME

1 hour 15 minutes, 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 ten** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is **90**.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in **question 8(b)**.

For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Total
Marks

2 Tobacco smoke contains substances that cause harmful effects on the body.

(a) Write down the name of three of these substances.

1. _____

2. _____

3. _____

[3]

(b) Choose one of these substances. Write about **two** harmful effects it has on the body.

Substance _____

Harmful effects on the body _____

_____ [2]

Cannabis is an illegal drug.

(c) Write about **one** harmful effect that taking cannabis has on a person.

Write about **one** harmful effect that taking cannabis has on society.

_____ [2]

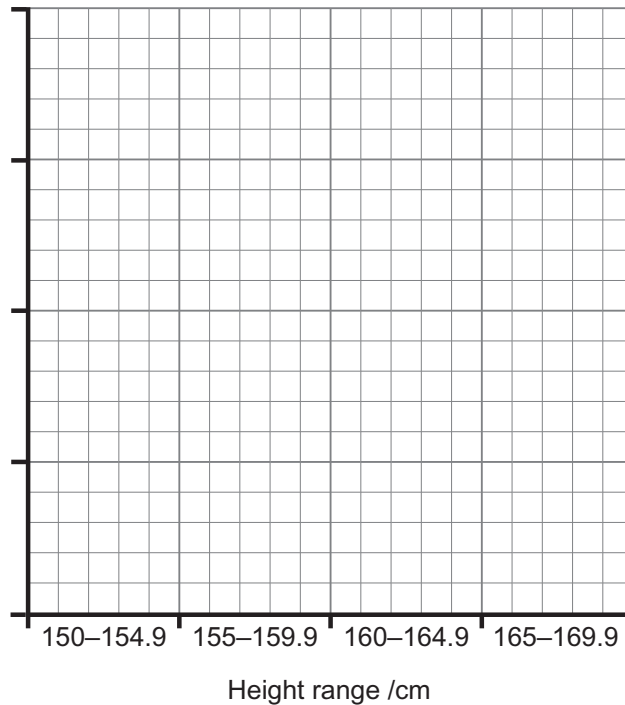
Examiner Only

Marks Remark

- 3 (a) Twenty girls had their height measured on their sixteenth birthday. The number of girls in each height range is given in the table below.

Height range /cm	Number of girls
150–154.9	2
155–159.9	6
160–164.9	8
165–169.9	4

- (i) On the grid below, plot a histogram using the data in the table. Add a label and a scale to the y-axis.



[4]

- (ii) Which height range is the most common for these girls?

_____ cm

[1]

- (iii) The difference in height is an example of variation. Write down the two factors that cause variation in height.

1. _____

2. _____

[2]

Examiner Only	
Marks	Remark

After implantation, the placenta develops. The placenta allows substances to pass across from the mother to the foetus and from the foetus to the mother.

(v) Write down the name of two substances, needed by the foetus, that pass across the placenta **from the mother** to the foetus.

1. _____

2. _____

[2]

Harmful substances like alcohol can also pass across the placenta from the mother to the foetus.

(vi) Write down **one** harmful effect of alcohol on the development of the foetus.

_____ [1]

(vii) Write about **one** way that the government could encourage pregnant women not to drink alcohol.

_____ [1]

(b) A sex hormone in females causes secondary sexual characteristics to develop.

Fill in the table below.

Name the hormone and name the organ where the hormone is produced.

Write about and describe two secondary sexual characteristics that the hormone causes to develop.

Name of female sex hormone	Organ where produced	Secondary sexual characteristics developed
		1.
		2.

[4]

Examiner Only	
Marks	Remark

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(Questions continue overleaf)

- (c) The MMR vaccine gives immunity against measles, mumps and rubella.

The table below shows the percentage of the population who got the MMR vaccine in 2011, in the different regions of the United Kingdom.

Region of United Kingdom	Percentage of the population who got the MMR vaccine
England	89.1
Wales	91.5
Scotland	93.2
Northern Ireland	92.9

- (i) Work out the difference in the percentage of the population who got the MMR vaccine in Northern Ireland compared to England.

_____ % [1]

In 2011, there were fewer cases of measles in Northern Ireland than in England.

- (ii) Write down **one** reason why there were fewer cases of measles in Northern Ireland than in England, in 2011.

_____ [1]

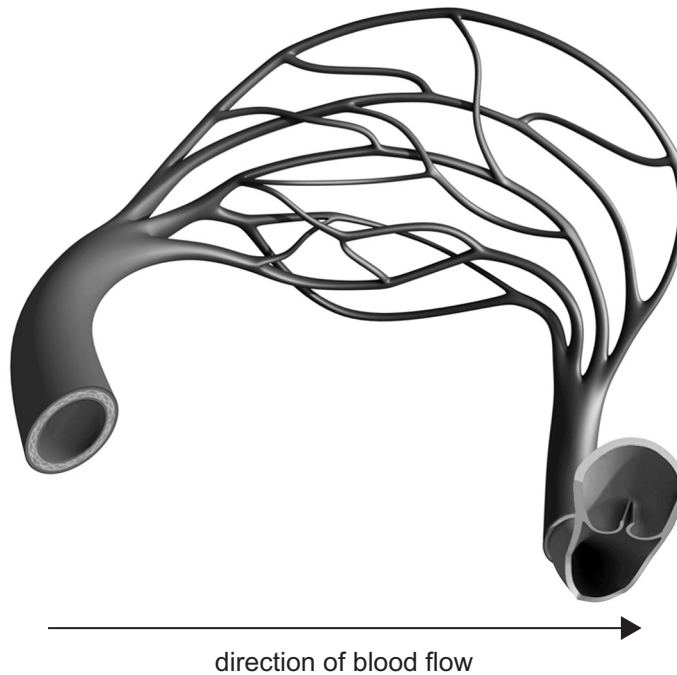
- (iii) Write down the name of the scientist who developed the first vaccine.

_____ [1]

Examiner Only

Marks Remark

- 7 (a) Look at the diagram below. It shows an artery and a vein connected by capillaries. Veins have valves. Arteries and capillaries do not have valves.



© 3D4Medical.com/ Science Photo Library

- (i) Using the information given and your knowledge, label the vein on the diagram. [1]

- (ii) What is the function of valves in a vein?

_____ [1]

- (iii) Write down two differences between blood flowing in an artery and blood flowing in a vein.

1. _____ [2]

2. _____

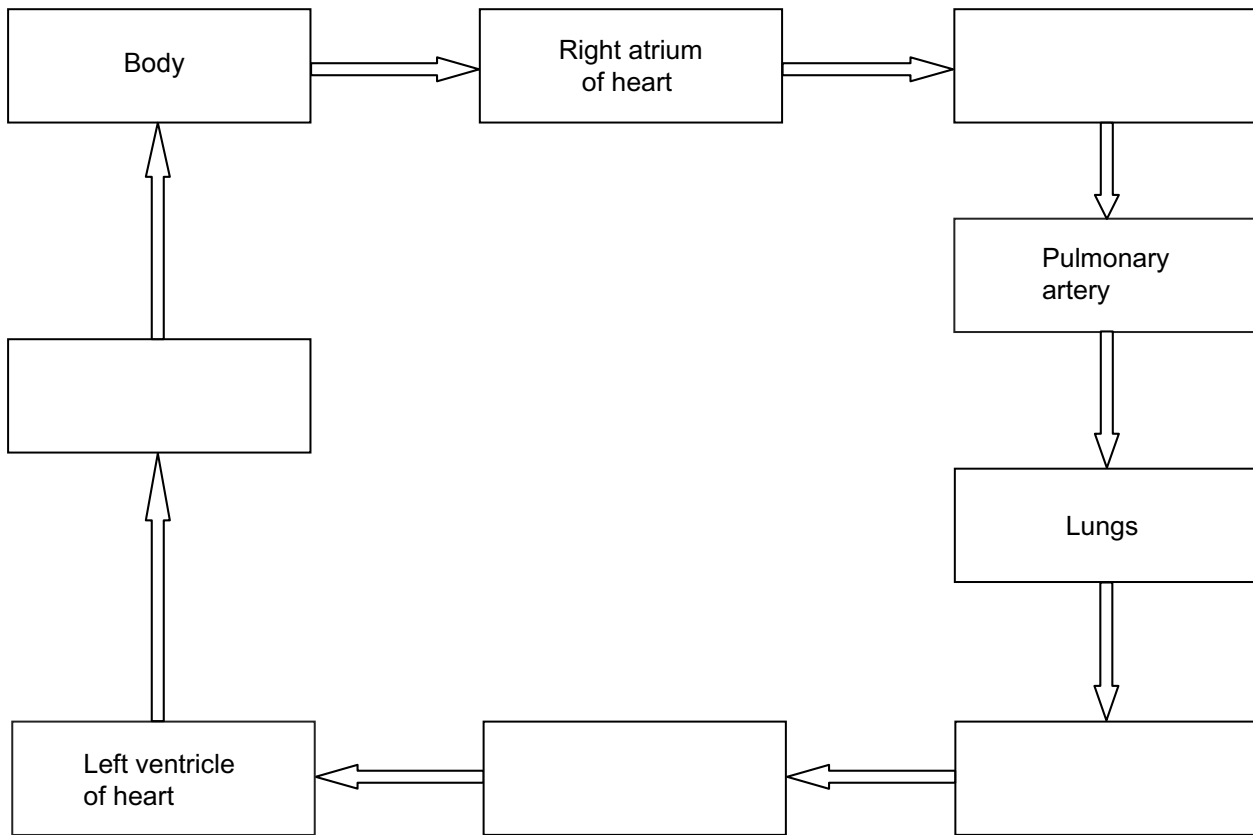
Examiner Only	
Marks	Remark

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(Question 7 continues overleaf)

(iii) In the diagram below, fill in the empty boxes to show the passage of blood through the heart and around the body.

The empty boxes show heart chambers or blood vessels.



[4]

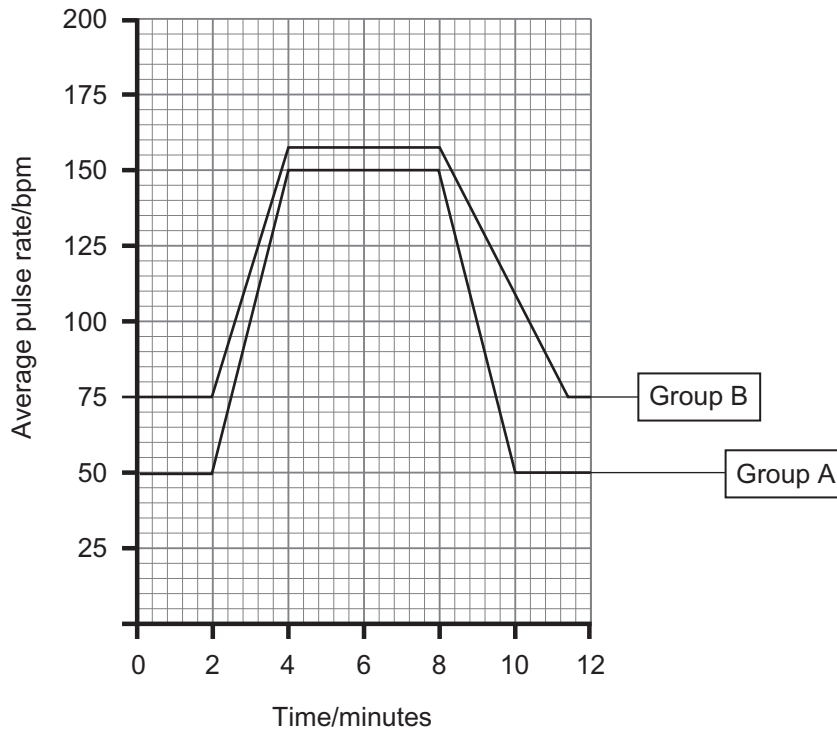
(iv) Write the name of the blood vessel which brings oxygenated blood to the liver.

[1]

Examiner Only	
Marks	Remark

- 8 (a) Look at the graph below. It shows the average pulse (heart) rates of two groups of students before exercise, during exercise and after exercise.

The pulse rates are measured in beats per minute (bpm).



© CCEA

- (i) When did the students start to exercise?
Use the graph to answer this question.

_____ min [1]

- (ii) Write down three differences in the average pulse rates between Group A and Group B.
Use the graph to answer this question.

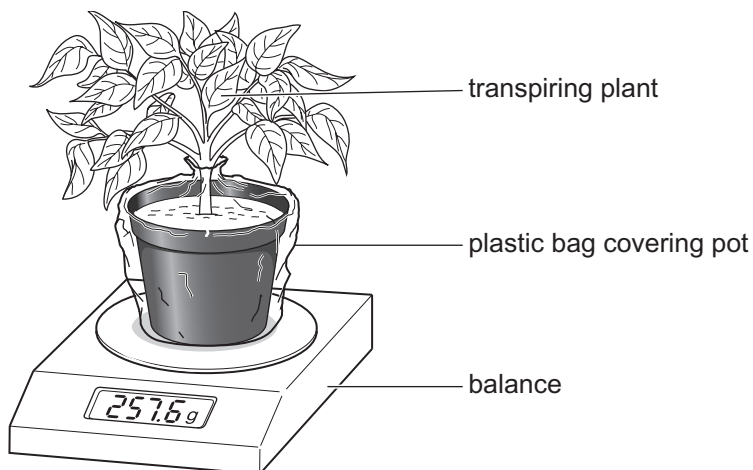
1. _____
2. _____
3. _____ [3]

- (iii) Students in Group A exercise regularly.
Write down two ways that regular exercise helps the **circulatory system**.

1. _____
2. _____ [2]

Examiner Only	
Marks	Remark

- (b) Look at the diagram below. It shows apparatus used to investigate the effect of surface area of leaves on the rate of transpiration in a plant.



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- (i) Why was the pot covered with a plastic bag?

_____ [1]

The plant was weighed and left for **24 hours**. It was then reweighed.

The **rate** of transpiration was worked out as 3.8 g per hour.

Some leaves were removed from the plant and the experiment was repeated.

The table below shows the result for the second experiment.

Mass of plant at start /g	Mass of plant after 24 hours /g
257.6	185.6

- (ii) Work out the rate of transpiration (in g per hour) in the second experiment.

Use the data in the table above to do this.

Show your working out.

_____ g per hour [2]

Examiner Only

Marks Remark

(iii) Write about and explain why the rate of transpiration is lower when some leaves were removed.

_____ [2]

(iv) Plants use water in transpiration.

Write down two **other** ways that plants use water.

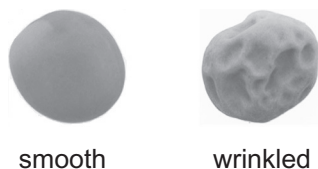
1. _____
2. _____ [2]

Examiner Only	
Marks	Remark

(b) Genes control characteristics in organisms.

Peas can be smooth or wrinkled.

This characteristic is shown in the photograph below.



© Walter Eberhart, Visuals Unlimited/ Science Photo Library

Let H represent the allele for smooth peas.

Let h represent the allele for wrinkled peas.

(i) Using a Punnett square, show the possible offspring produced when a heterozygous, smooth pea plant is crossed with a wrinkled pea plant.

[4]

(ii) Using your Punnett square, write down the ratio of smooth pea plants to wrinkled pea plants.

[1]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only	
Marks	Remark

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