

Ce	ntre Number
71	
Cano	didate Number

General Certificate of Secondary Education 2014

Double Award Science: Biology

Unit B2

Foundation Tier

[GSD41]

FRIDAY 6 JUNE 2014, AFTERNOON



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 Exa	miner's only
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Total	
Marks	

) Look at the lists below.	
	icroorganism to the disease that it
Type of microorganism	Disease
Bacteria	Athlete's foot
Virus	Mumps
Fungus	Salmonella
	[2]
Use the list above to answer question	one (h) and (c)
'	oris (b) and (c).
	sease caused by eating undercooked
(b) Write down the name of the dis	
(b) Write down the name of the dis	sease caused by eating undercooked [1] De of microorganism that can be
(b) Write down the name of the dischicken.(c) Write down the name of the type	sease caused by eating undercooked [1] De of microorganism that can be
(b) Write down the name of the dischicken.(c) Write down the name of the type	sease caused by eating undercooked [1] De of microorganism that can be penicillin. [1]
(b) Write down the name of the dischicken.(c) Write down the name of the type treated by an antibiotic such as	sease caused by eating undercooked [1] De of microorganism that can be penicillin. [1]
(c) Write down the name of the typ treated by an antibiotic such as	sease caused by eating undercooked [1] De of microorganism that can be penicillin. [1] If the penicillin is foot be prevented?
(b) Write down the name of the dischicken.(c) Write down the name of the type treated by an antibiotic such as	sease caused by eating undercooked [1] De of microorganism that can be penicillin. [1] If the penicillin is foot be prevented?
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8846.04 ML 2

1

Tob	pacco smoke contains substances that cause harmful effects on the dy.		Examin Marks	er Only Remark
(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 i has on the body.	t		
	Substance			
	Harmful effects on the body			
		[2]		
Cai	nnabis is an illegal drug.			
	Write about one harmful effect that taking cannabis has on a perso	n.		
	Write about one harmful effect that taking cannabis has on society.			
	Time about one harmal enest that taking calmable has on seciety.			
		[2]		

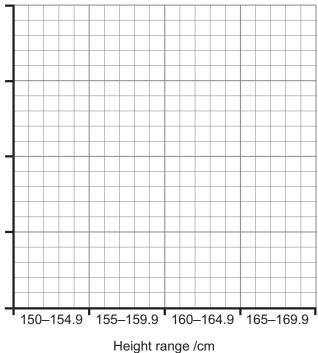
2

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

Examin	er Only
Marks	Remark

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]

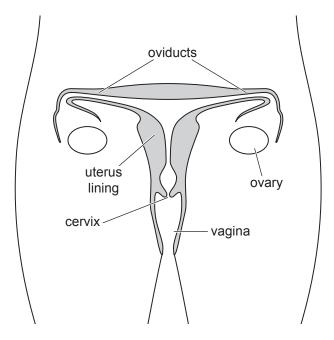
(iii) The difference in height is an example of variation. Write down the two factors that cause variation in height.

1.	

(b)	The same twenty girls were tested to see if they could roll their tongues.	Examiner Only Marks Remark
	The photograph shows a girl who can roll her tongue.	
	© Herve Conge, ISM / Science Photo Library	
	60% of the girls were able to roll their tongues.	
	(i) What percentage of the girls were not able to roll their tongues?	
	% [1]	
	(ii) How many of the twenty girls were not able to roll their tongues?	
	Show your working.	
	[2]	
(c)	What type of variation is shown by the girls being able or not able to roll their tongues?	
	Underline the correct answer from the list below.	
	continuous normal discontinuous [1]	

4 (a) Look at the diagram below. It shows part of the female reproductive system.

Examin	er Only
Marks	Remark



© Focus Educational Software Ltd

- (i) On the diagram, draw an X to show where a sperm nucleus fuses with an egg nucleus. [1]
- (ii) Write down the name of the process that happens when a sperm nucleus fuses with an egg nucleus.

______[1]

After a sperm nucleus fuses with an egg nucleus, a zygote is formed. This divides to form a ball of cells.

(iii) Write down the name of the type of cell division which happens to form a ball of cells.

_____[1]

After the ball of cells has developed, implantation happens.

(iv) Write down the name of the part of the female reproductive system where implantation happens.
Use the diagram to help you.

______[1]

	stances to pass across from the mother to the foetus and from us to the mother.	trie	Marks	R
(v)	Write down the name of two substances, needed by the foetu that pass across the placenta from the mother to the foetus.	S,		
	1			
	2	[2]		
Hari	mful substances like alcohol can also pass across the placenta	1		
from	write down one harmful effect of alcohol on the development the foetus.			
from	n the mother to the foetus. Write down one harmful effect of alcohol on the development	of		
from (vi)	write down one harmful effect of alcohol on the development the foetus.	of		
from (vi)	Write down one harmful effect of alcohol on the development the foetus. Write about one way that the government could encourage	of _ [1]		

Organ where produced	Secondary sexual characteristics developed
	1.
	2.

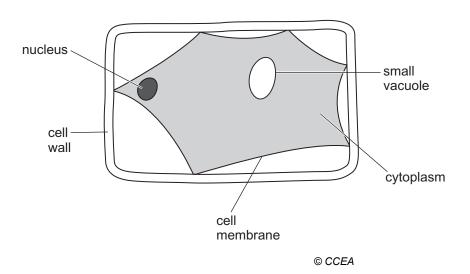
Write about and describe two secondary sexual characteristics that the hormone causes to develop.

produced.

[4]

5 Look at the diagram below. It shows a plant cell as it would look under a microscope. The cell had been left in strong sugar solution for 30 minutes.





(a)	What term	describes	the cell	as it	looks	in the	diagram?
-----	-----------	-----------	----------	-------	-------	--------	----------

______ [1]

(b) Redraw the cell, **to the same scale**, as it would look after being left in water for 30 minutes.

Label the cell wall, cell membrane and vacuole on your drawing.

[4]

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(Questions continue overleaf)

(a) Immunity to disease is produced by increased antibody levels in the blood.

Examiner Only		
Marks	Remark	

The four types of immunity are listed below.

- Natural innate
- Natural acquired
- Artificial active
- Artificial passive.
- (i) Which type of immunity, from the list above, best describes getting a disease and then recovering from the disease?

______ [1]

(ii) Which type of immunity, from the list above, best describes a person getting ready-made antibodies against a disease such as tetanus?

______[1]

(b) Look at photograph below. It shows the type of mosquito that can carry the virus that causes the disease yellow fever. When a person is bitten by this type of mosquito, the virus can be passed to that person. Approximately 7% of people who catch yellow fever die from it within three weeks.



© Sinclair Stammars/ Science Photo Library

Paul is planning to visit Africa and has been advised to be vaccinated against yellow fever before he travels.

Write down two reasons why Paul should be vaccinated before he travels.

1. ______

2. _____ [2]

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

Examiner Only

Marks Remark

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.

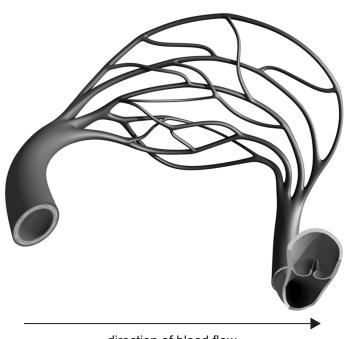
______[1]

(iii)	Write down th	e name of t	he scientist	who dev	veloped	the	first
	vaccine.						

_____[1]

(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.

Examiner Only		
Marks	Remark	



direction of blood flow

© 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?

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

1.			

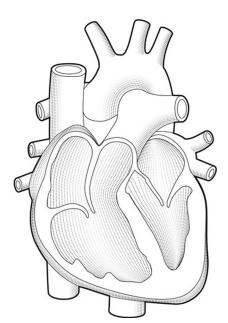
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(Question 7 continues overleaf)

(b) The heart pumps blood around the body.

The diagram below shows a section through the heart.

Examiner Only



© Paul Wootton/ Science Photo Library

(i) On the diagram, label the left ventricle and the pulmonary artery. [2]

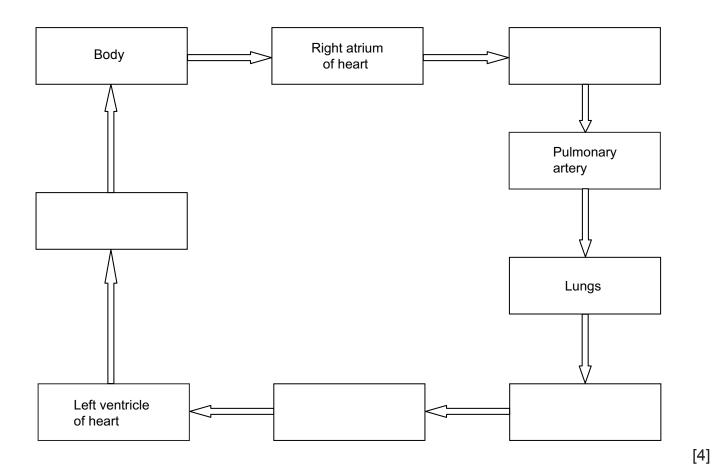
Blood passes through the heart twice during one complete circuit of the body.

(ii) What name describes the passage of blood twice through the heart during one complete circuit of the body?

______[1]

(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.



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

Examin	er Onl
Marks	Rema
1	

[1]

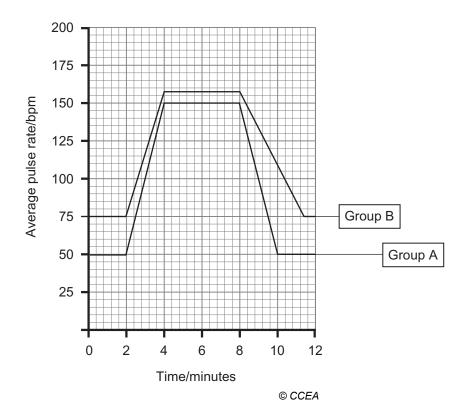
8846.04 ML 15 [Turn over

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.

Examiner Only

Marks Remark

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



(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. _____

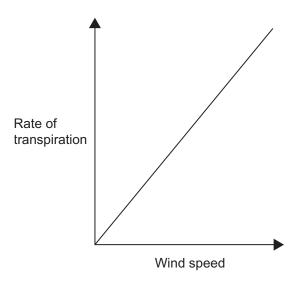
2. ______[2]

(b)	A person needs a balanced diet that is low in cholesterol to have a healthy heart.	Exami Marks	ner Only Remark
	Write about and explain how a diet that is high in cholesterol could cause a heart attack.		
	In this question you will be assessed on your written communication skills, including the use of specialist scientific terms.		
		_	
		_	
		_	
		_	
		_	
		_	
		_	
	[6	6]	

(a) Look at the graph below. It shows the effect of increasing wind speed on the rate of transpiration in plants.

9

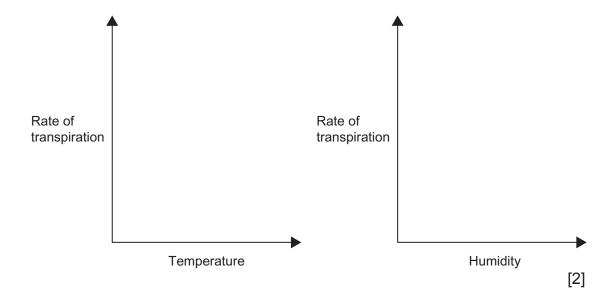
Examiner Only					
Marks	Remark				



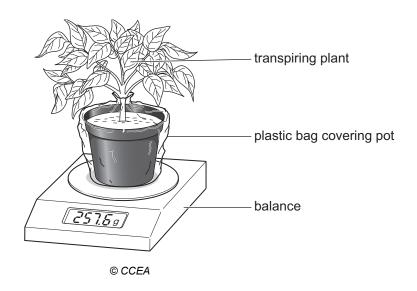
(i) Write about and describe the trend shown in the graph above.

Two other factors that affect the rate of transpiration in plants are temperature and humidity.

(ii) Draw a line to show the effect of increasing temperature on the rate of transpiration on the first axis below. Draw a line to show the effect of increasing humidity on the rate of transpiration on the second axis below.



(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.



(1)	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 3.8g 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 /		
257.6	185.6		

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

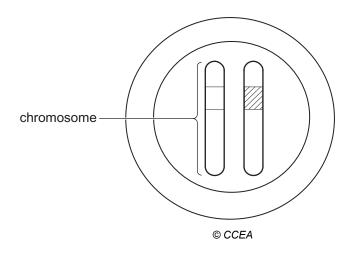
Use the data in the table above to do this.

Show your working out.

_____ g per hour [2]

i) Write about and explain why the rate of transpiration is lower when some leaves were removed.	Ma	examiner Only arks Rema
v) Plants use water in transpiration.		
Write down two other ways that plants use water.		
1		
2	[2]	

10 (a) Look at the diagram below. It shows a cell that has a nucleus with two chromosomes.



(i) Write the name of the molecule that makes up chromosomes.

______[1]

(ii) Draw the cells and chromosomes that would be produced when this cell divides by **mitosis**. Do this in the space below.

Ge	nes control characteristics in organisms.		Examin Marks	er Onl
Pe	as can be smooth or wrinkled.		Walks	Kem
Thi	s characteristic is shown in the photograph below.			
	smooth wrinkled			
	© 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.			
		F 43		
		[4]		
(ii)	Using your Punnett square, write down the ratio of smooth pea plants to wrinkled pea plants.			
		[1]		

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