Rewarding Learning

Centre Number

Candidate Number

General Certificate of Secondary Education
2014–2015

Science: Single Award

Unit 1 (Biology)
Foundation Tier

ML

[GSS11]

TUESDAY 24 FEBRUARY 2015, 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 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 **9(a)**.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
Total Marks	

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Examiner Only	
Marks	Remark

1 **(a)** The table below is about **microorganisms** that cause **disease**. Complete the table below.

Choose from:

tuberculosis **bacteria** **flu** **fungi**

Type of microorganism	Disease
	athlete's foot
virus	
	chlamydia

[3]

(b) Complete the following sentences.

Choose from:

poisoned **hair** **skin** **trapped**

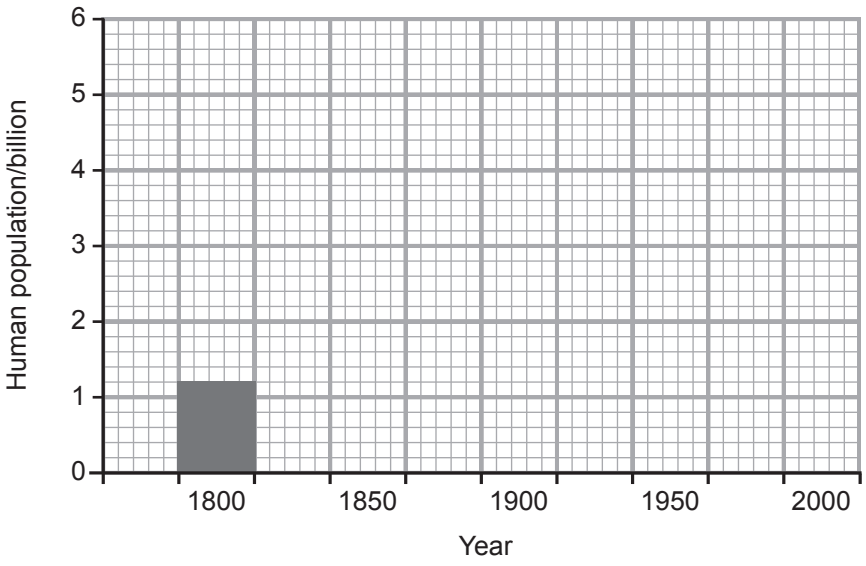
The _____ acts as a barrier to prevent most microorganisms entering the body.

Microorganisms that enter through the mouth and nose are _____ by mucous membranes. [2]

2 Look at the table below. It shows the change in human population between the years 1800 and 2000.

Year	Human population/ billion
1800	1.2
1850	1.4
1900	1.8
1950	2.4
2000	6.0

(a) Use the information in the table to complete the bar chart below.



[2]

(b) Describe the trend shown by this information.

_____

_____ [1]

Examiner Only

Marks	Remark

(c) Humans have caused the **extinction** of some species, including many types of fish.

(i) What does **extinction** mean?

_____

_____ [1]

(ii) Look at the list below. It shows some features of modern sea fishing.

Circle **two** features that may protect fish stocks and help prevent the extinction of some types of fish.

large fishing nets

refrigerators to store caught fish

nets with large mesh sizes

limits on the number of fishing boats

boats with good navigation systems

[2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

3 **(a)** Look at the table below. It gives information about some pupils in a class.

	Characteristic			
Pupil	**Can roll tongue**	**Height/cm**	**Weight/kg**	**Eye colour**
Maeve	yes	141	39	blue
Mary	yes	152	37	brown
Sean	yes	152	41	brown
John	yes	155	46	blue
Katrina	no	146	42	blue

(i) Which **two characteristics** show continuous variation?

_____ and _____ [1]

(ii) Calculate the percentage of pupils that have brown eyes.

(Show your working out.)

_____ % [2]

(b) Look at the photograph below. It shows some swans in a small shallow lake.

Source: Chief Examiner

The swans feed on plants, insects and water snails from the bottom of the lake. Explain fully **one** way the swans are adapted for feeding. Use only the information given in this question.

_____

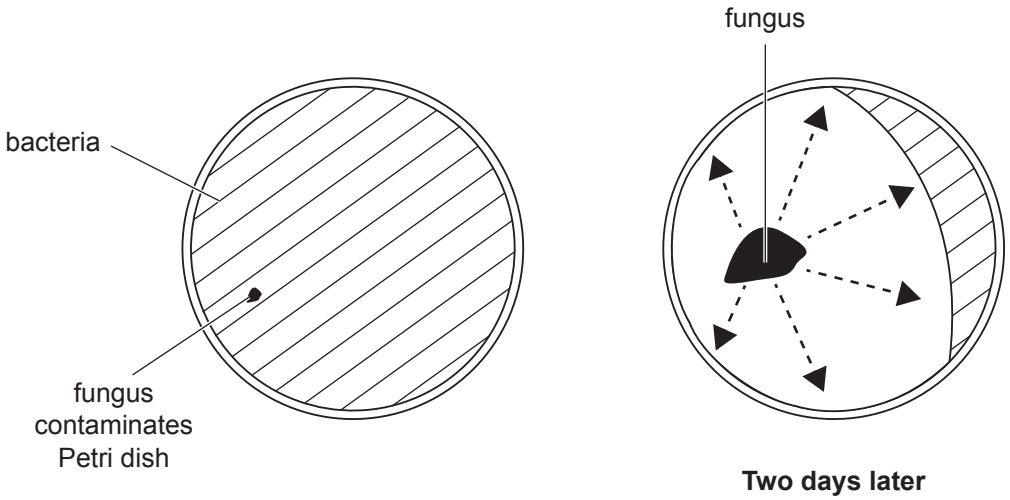
_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

4 **(a)** Look at the diagram below. It shows what happened when a Petri dish containing bacteria was contaminated by fungus.



(i) Describe and explain the effect of contamination by the fungus.

_____

_____

_____ [2]

(ii) Name the scientist who first observed the effect of fungus on bacteria.

Choose from:

Pasteur **Wilson** **Fleming**

_____ [1]

(iii) Name the **antibiotic** developed from this fungus.

_____ [1]

(b) Mushrooms are another type of fungus that are often used in cooking. They contain very little carbohydrate and fat but are rich in vitamins and minerals. Mushrooms also contain a large amount of water.

(i) Why are mushrooms suitable for someone who is trying to reduce their energy intake?
Use only the information given in this question.

_____

_____ [1]

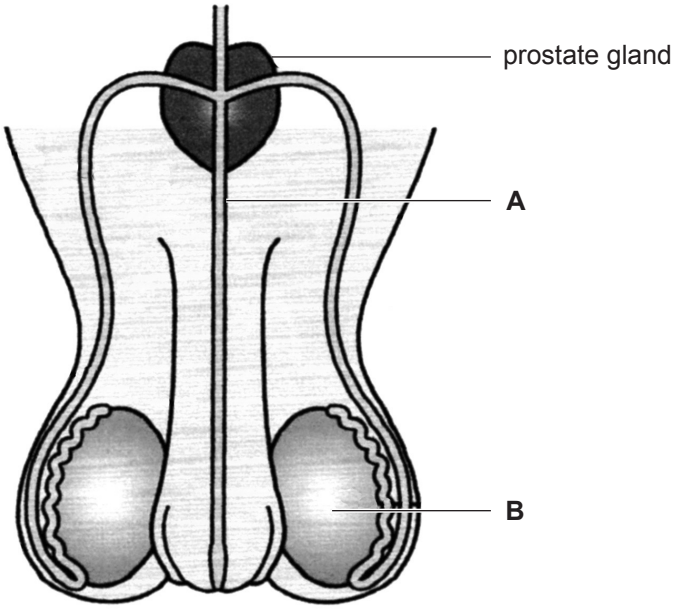
(ii) Give **one** function of water in the body.

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

5 **(a)** The diagram below shows the male reproductive system.



(i) Name the structures labelled **A** and **B**.

A _____

B _____ [2]

(ii) What structure is cut during a vasectomy?
On the diagram, mark this structure with an **X**. [1]

(iii) What is the function of the prostate gland?

Choose from:

makes sperm : feeds sperm : stores urine

_____ [1]

(b) The table below shows information about some methods of contraception.

Method of Contraception	Permanent	Advantages	Disadvantages
Condom	no	protects against sexually transmitted diseases	mainly reliable but could fail
Contraceptive pill	no	very reliable	can cause side-effects such as weight gain
Male and female sterilisation	yes	almost 100% reliable	very difficult or impossible to reverse

(i) How does the condom prevent pregnancy?

_____

_____

_____ [2]

(ii) Many 20 year olds prefer condoms, rather than the pill or sterilisation. Use the information given in this table to explain why.

_____

_____

_____

_____

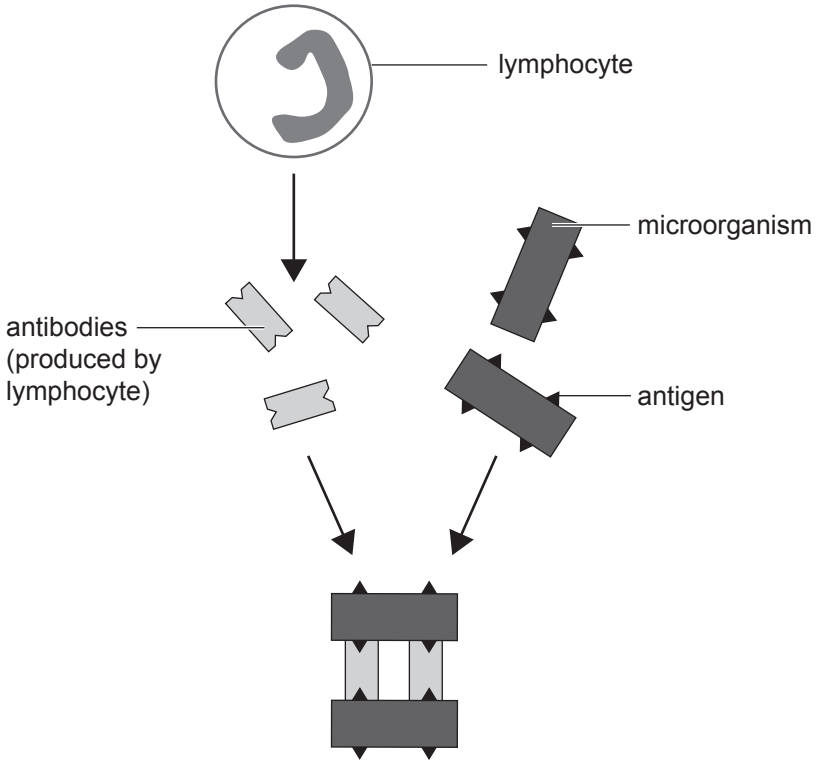
_____ [3]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

6 **(a)** Look at the diagram below. It shows how **lymphocytes** (white blood cells) produce antibodies in response to infection by microorganisms.



(i) Describe and explain how antibodies fight infection. Use the diagram and your knowledge in your answer.

_____

_____

_____

_____

_____ [3]

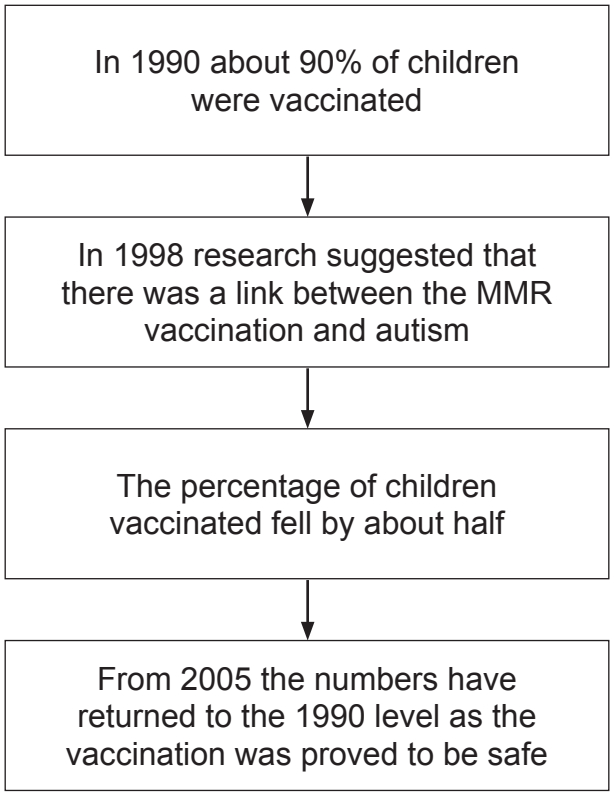
(ii) Another type of white blood cell fights infection by **phagocytosis**. Describe the process of **phagocytosis**.

_____

_____

_____ [2]

(b) Look at the flow chart below. It shows how the number of children being vaccinated for MMR changed between 1990 and today.



(i) Describe how the number of children having the MMR vaccination changed between 1990 and today.

_____

_____

_____

_____ [2]

(ii) Some parents are still not sure that the MMR vaccination is safe today. How does this information show you this?

_____ [1]

(c) Name the type of immunity produced by vaccinations.

_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

7 **(a)** Albinism is an inherited condition. People who have albinism cannot make the skin pigment melanin. The melanin gives skin its colour, and more importantly, it helps protect against the Sun's harmful UV rays.

Albinism is caused by a mutation in the gene that controls the production of melanin.

(i) Name the core component in a gene that is damaged in a mutation.

_____ [1]

(ii) Explain fully why people with albinism should stay out of strong sunlight.

_____

_____

_____ [2]

(b) The allele that causes albinism is recessive to the normal allele.

Examiner Only	
Marks	Remark

(i) Complete the genetic diagram below to show the offspring of a cross between two parents who are **heterozygous** for albinism.

Use the symbols: A = normal allele; a = albino allele

		a
A	AA	

[2]

(ii) Give the genotype that causes albinism.

_____ [1]

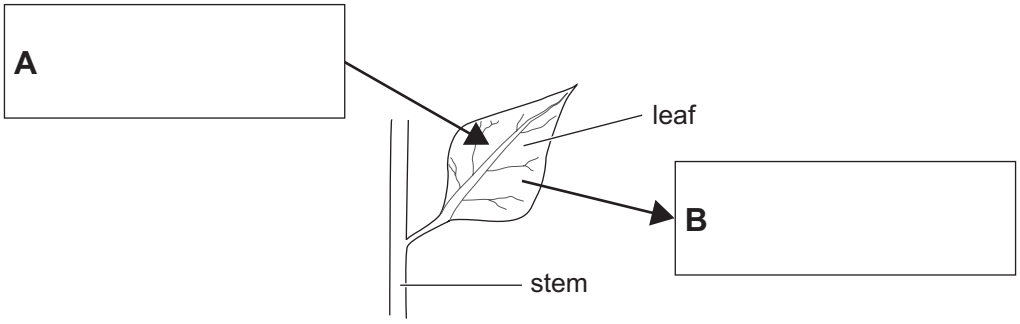
(iii) From the genetic diagram, what is the probability of a child **not** having albinism?

_____ [1]

Examiner Only	
Marks	Remark

8 **(a)** The diagram below shows a leaf from a plant in **the dark**.

(i) In box **A** write the name of the gas that enters the leaf.
In box **B** write the name of the gas that leaves the leaf.

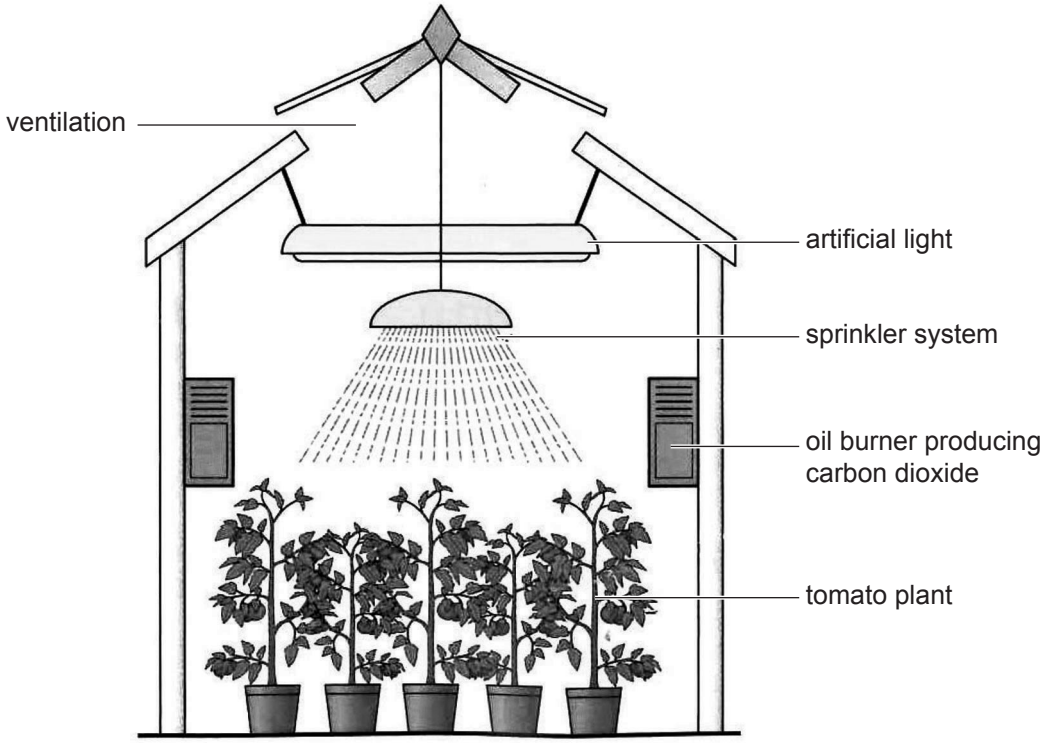


[1]

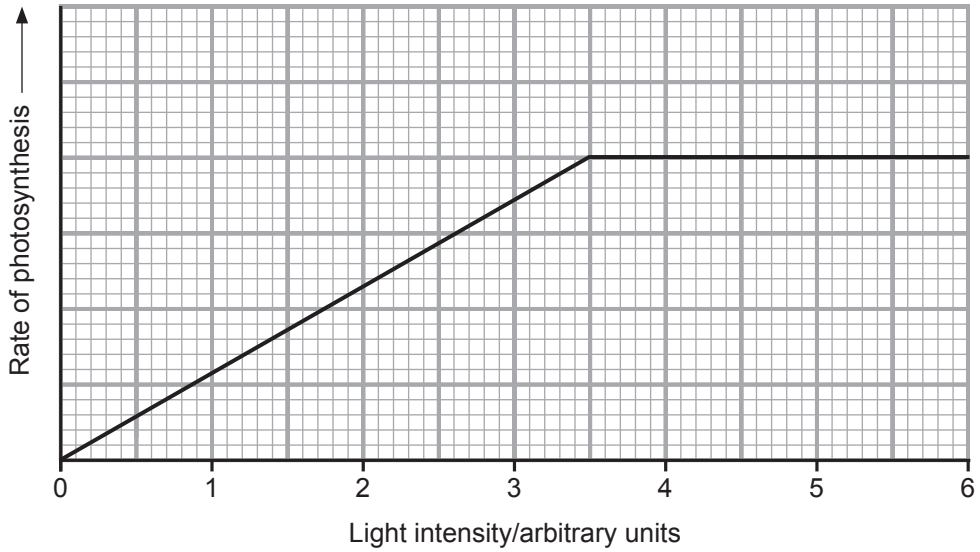
(ii) Name the process that causes this gas exchange.

_____ [1]

(b) The diagram below shows tomato plants growing in a glasshouse.



Look at the graph below. It shows the effect of light intensity on the rate of photosynthesis in tomato plants in a glasshouse. In glasshouses, the light intensity can be increased by using artificial lighting.



(i) What is the best light intensity to use to give the most profit if the tomatoes were grown for sale?

Light intensity _____ arbitrary units

Explain your answer. _____

_____

_____ [2]

(ii) Artificial lighting is used to increase light intensity. Explain **one** other way glasshouses are adapted to increase the rate of plant growth.

_____

_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

9 **(a)** How could you investigate the effect of planting density (the number of seedlings in a pot) on plant growth?

Your answer should include:

- **two** things that make the results valid (fair test)
- a description and explanation of the results you would expect.

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

[6]

(b) The grey squirrel is a competitive invasive species.

(i) Name **one** other competitive invasive species.

[1]

(ii) Give **one** feature that all competitive invasive species have in common.

[1]

THIS IS THE END OF THE QUESTION PAPER

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