



Rewarding Learning

General Certificate of Secondary Education
2021

Centre Number

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Candidate Number

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Single Award Science: Biology

Unit 1

Foundation Tier



[GSA11]

GSA11

MONDAY 22 NOVEMBER, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

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

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all nine** questions.

INFORMATION FOR CANDIDATES

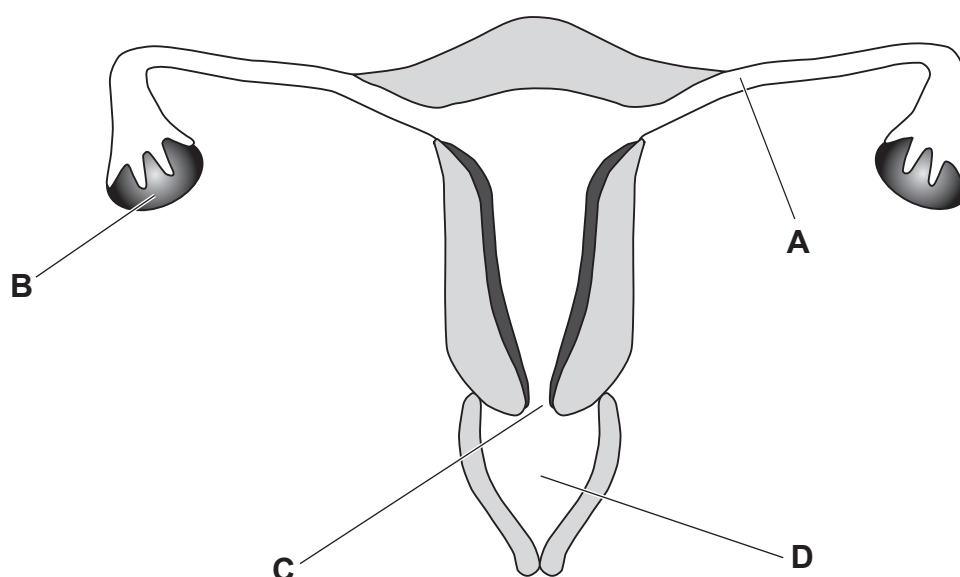
The total mark for this paper is 60.

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 7.



- 1 (a) The diagram below shows the female reproductive system.



- (i) Which part (**A**, **B**, **C** or **D**) is:

the vagina? _____

the cervix? _____

[2]

- (ii) Which part (**A**, **B**, **C** or **D**) produces eggs?

_____ [1]

- (b) Complete the sentence below about fertilisation.

Choose from:

ovary

zygote

oviduct

foetus

Fertilisation takes place in the _____ when the sperm and egg nuclei join to give a _____.

[2]



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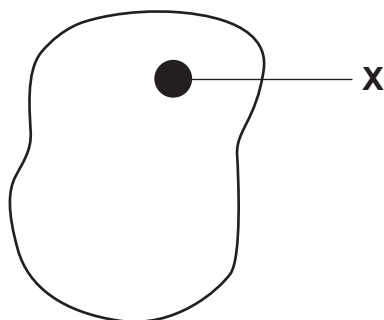
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(Questions continue overleaf)



- 2 (a) Diagram A below shows a human cheek cell (an animal cell) when viewed under a microscope.

Diagram A

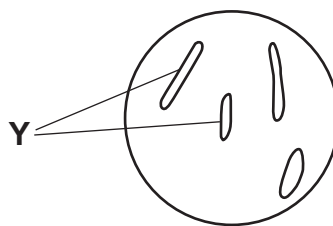


- (i) Name the part labelled X.

[1]

Diagram B shows the genetic structures found inside the part labelled X from the diagram above.

Diagram B



- (ii) Name the genetic structures labelled Y.

[1]



(b) Plant cells contain more parts than animal cells.

(i) Name two parts found **only** in plant cells.

_____ and _____ [2]

(ii) Name the solution that would be used to stain plant cells when viewing them under a microscope.

Choose from:

Iodine

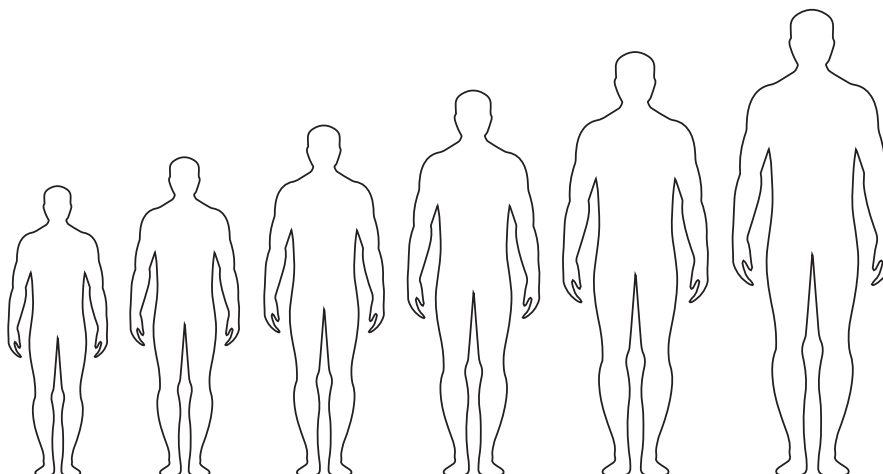
Biuret

Benedict's

_____ [1]



- 3 (a) The diagram below shows a group of adult males of different heights. Height is an example of continuous variation.



- (i) What is meant by the term **continuous variation**?

_____ [1]

- (ii) Give one **cause** of variation in height.

_____ [1]

- (iii) Apart from height, give **one** other example of continuous variation.

_____ [1]

- (b) Which type of graph is most commonly used to display data about continuous variation?

Circle your answer.

bar chart : line graph : histogram [1]



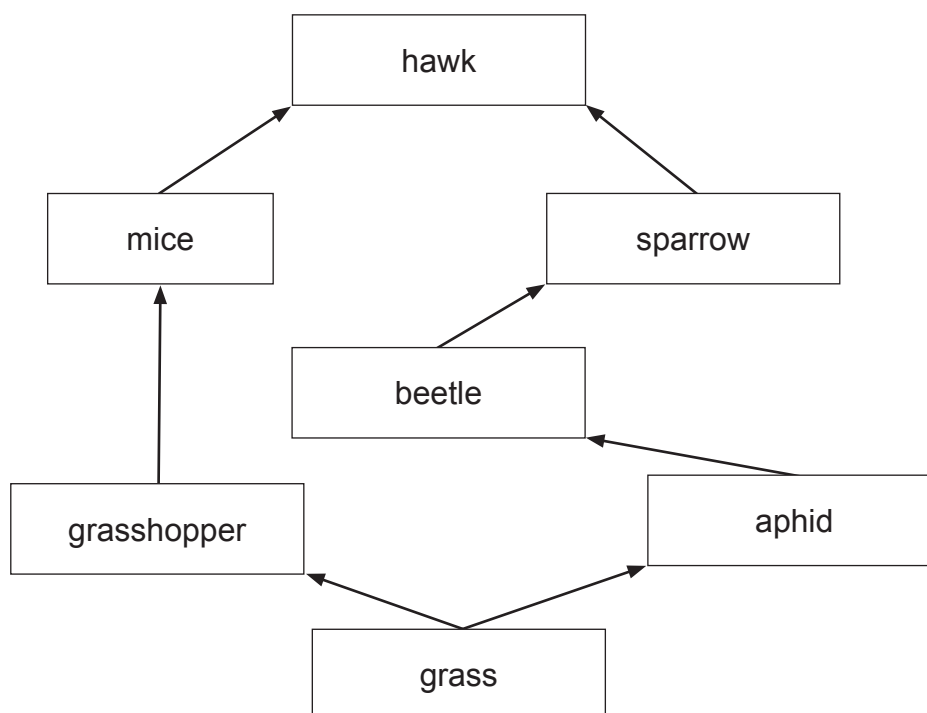
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4 (a) A simple food web is shown below.



(i) From the food web above name one:

primary consumer. _____

secondary consumer. _____

[2]

(ii) Complete the sentence below about producers in a food web.

Producers use sunlight energy to make food by a process

called _____ . [1]

(iii) What could happen to the number of mice if the number of sparrows decreases? Explain your answer.

_____ [2]



Biodiversity is the term used to describe the range of species in a particular area.

- (b) Circle **two** statements below that describe what a farmer could do to help **increase** biodiversity on his farmland.

replant hedgerows

use a lot of artificial fertiliser on his land

not plant crops right to the edge of his fields

cut down trees

[2]

[Turn over



- 5 (a) The substances in cigarette smoke can seriously damage our health.

Complete the table below about two substances found in cigarette smoke and their effects on our health.

Substance	Effect
tar	
	increases heart rate

[2]

- (b) Another drug which can affect our health is alcohol. To try to reduce the amount of alcohol consumed, Scotland has made it illegal to sell alcohol for less than 50p per unit.

- (i) Calculate the minimum cost (in Scotland) of the bottle of wine shown below.



£ _____ [1]



Before the introduction of a minimum price for alcohol, this bottle of wine cost £3.88.

- (ii) Calculate how much extra this bottle of wine will cost after the price rise in Scotland.

£ _____ [1]

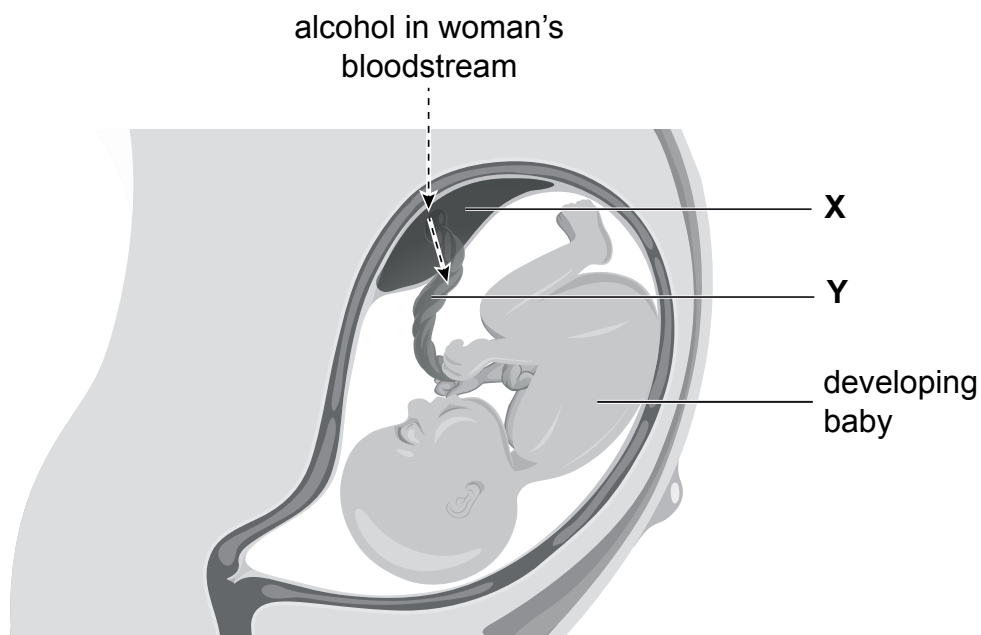
- (iii) Suggest **one** benefit to the NHS (National Health Service) of having a minimum price for alcohol.

_____ [1]

[Turn over



The diagram below shows how alcohol is passed from a pregnant woman to her developing baby.



(c) Name the structures (X and Y) which alcohol will pass through to reach her developing baby.

X _____

Y _____

[2]



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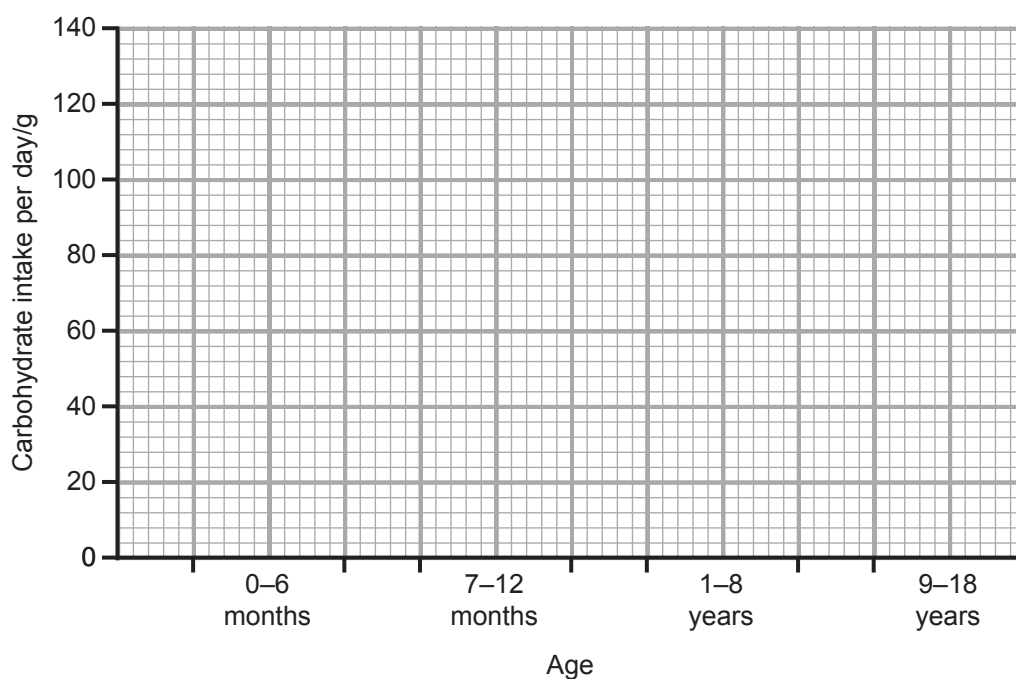


- 6 (a) Carbohydrates are one of the main food types that we need for a balanced diet.

The table below shows the recommended carbohydrate intake per day for different age groups.

Age	Carbohydrate intake per day/g
0–6 months	60
7–12 months	90
1–8 years	120
9–18 years	136

- (i) On the grid below draw a **bar chart** for this information.



[2]



(ii) State the trend shown by this information.

[1]

(iii) Explain this trend in terms of the function of carbohydrate in the body.

[2]

(b) Respiration is the process in which the body uses glucose, a type of carbohydrate.

Complete the word equation below for respiration.

glucose + _____ → carbon dioxide + water

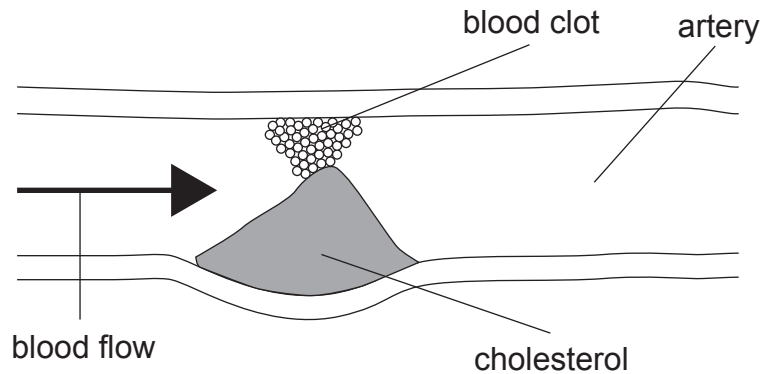
[1]

[Turn over



Fat is also needed for a balanced diet, but too much increases the risk of heart disease as it raises cholesterol levels.

- (c) The diagram below shows an artery that has been narrowed due to a build-up of cholesterol.



- (i) Using the diagram and your knowledge, suggest what might happen if the cholesterol blocks an artery that leads to the heart.

[3]

- (ii) Apart from eating less fat, give one other **dietary** change that could help reduce the risk of developing heart disease.

[1]

Water is also needed for a balanced diet.

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

[1]



- 8 (a) The British honeybee is at risk of extinction in the United Kingdom. One reason for this is the increase in the number of Asian hornets.

The table below gives some information about Asian hornets and British honeybees.

	Asian hornet	British honeybee
number in colony (summer)	6000	40 000
speed of flight/mph	26–30	15–20
food source	honeybees	nectar and pollen
sting (venom)	highly toxic to humans	relatively harmless to humans
average body length/mm	30	20

Use the information provided to answer the following questions.

- (i) Give **two** advantages that the Asian hornet has when catching their food.

1. _____

2. _____
_____ [2]

- (ii) Give **one** reason why reducing the number of Asian hornets could help prevent the extinction of honeybees.

_____ [1]



Some species can be described as competitive invasive species.

(b) Give **two** features that all competitive invasive species have in common.

1. _____

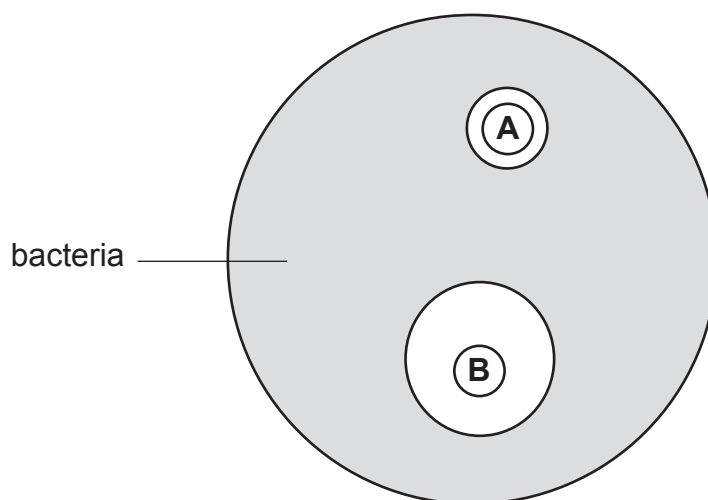
2. _____

[2]



- 9 (a) To investigate the effect of antibiotics on one type of bacteria, two discs (**A** and **B**) were soaked in different antibiotics. The discs were then placed in a Petri dish completely covered with the bacteria.

The diagram below shows the Petri dish after 2 days.



- (i) Using the diagram and your knowledge, explain why antibiotic **B** is more effective than antibiotic **A**.

[2]

- (ii) Suggest **one** thing that needed to be done to make this investigation a fair test.

[1]

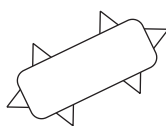
This investigation was repeated using a Petri dish containing fungus instead of bacteria.

- (b) Describe and explain the results that would be expected after 2 days.

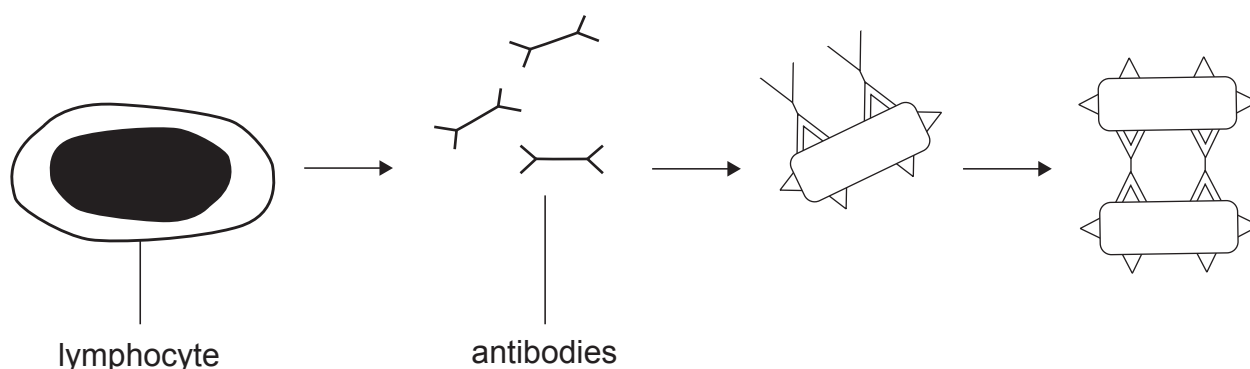
[2]



- (c) The diagram below represents a microorganism that has invaded the human body.



Shown below are antibodies produced by a lymphocyte and their effect on this microorganism.



- (i) Use the diagram and your knowledge to describe how antibodies help the body defend against this microorganism.

[2]

The diagram below shows a different microorganism.



- (ii) Explain why the same antibodies (Y-shaped) will have no effect on this microorganism.

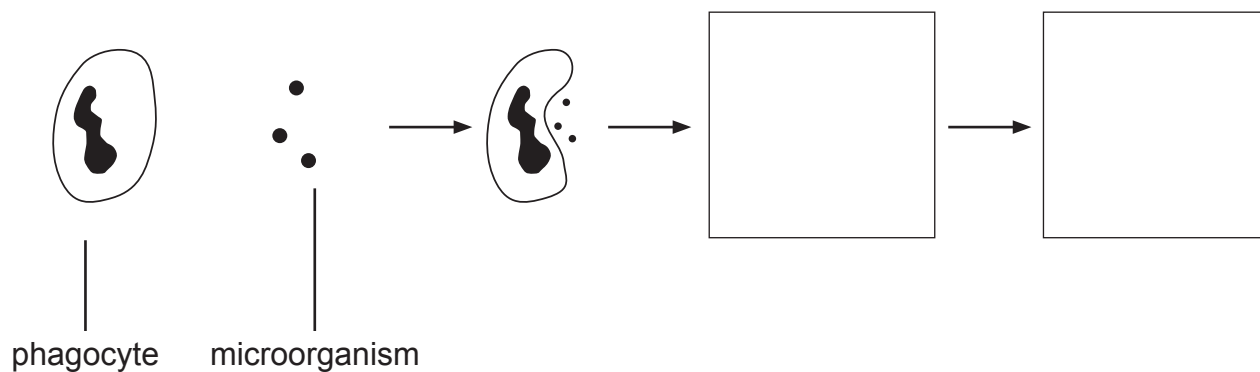
[1]

[Turn over]



Another type of white blood cell, called a phagocyte, helps to remove invading microorganisms from the body by a process called phagocytosis.

(iii) Complete the diagram below to show how phagocytosis takes place.



[2]

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For Examiner's
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Question Number	Marks
1	
2	
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4	
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7	
8	
9	

Total Marks	
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Examiner Number

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