

GCSE (9-1)

Examiners' report

TWENTY FIRST CENTURY SCIENCE BIOLOGY B

J257

For first teaching in 2016

J257/01 Summer 2023 series

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Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. A selection of candidate answers is also provided. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

Where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.

A full copy of the question paper and the mark scheme can be downloaded from OCR.

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Paper 1 series overview


The specification content of J257 Biology B is divided into eight chapters. The first six chapters describe the science content of the specification. Chapter seven describes Ideas about Science and covers the requirements of Working Scientifically. The final chapter describes the requirements for Practical Skills. The Breadth in Biology paper assesses content from across the specification. The paper includes short answer response questions such as structured questions, calculations and questions based on practical skills.

It would appear that candidates were well prepared for this examination and were entered for the correct tier. Almost all engaged fully with the paper and attempted to answer the majority of questions, leaving very few questions unanswered. Candidates did not appear to run out of time, and a wide spread of marks was obtained. It was evident that candidates understood the instructions for each question and were able to access them. Candidates continue to follow instructions well – unlike earlier series, there was no evidence of drawing extra lines or ticking extra boxes this year.

Candidates who did well on this paper generally:	Candidates who did less well on this paper generally:
<ul style="list-style-type: none"> used scientific terminology carefully and accurately, especially terminology associated with the immune system engaged fully with the questions, read them thoroughly and gave more detailed responses, answering in specific rather than generic terms demonstrated a range of mathematical skills and always showed their working demonstrated that they had attempted to practise or revise practical skills. 	<ul style="list-style-type: none"> omitted to attempt some questions did not understand or follow command words such as explain or describe did not use scientific terminology, e.g. used the word 'amount' rather than 'volume' demonstrated a lack of knowledge of basic ideas such as respiration and photosynthesis. The 'Breadth' paper J257/01 contains a greater proportion of AO1 questions (knowledge of scientific ideas and techniques) compared to the 'Depth' paper J257/02.

Question 1 (a)

1 (a) Write these structures in order of size.

Cell	Chromosome	Gene	Nucleotide	Nucleus
Smallest			
			
			
			
	Largest		

[4]

Most candidates obtained at least 2 marks on this question and knew that a nucleus is smaller than a cell, and that a chromosome is smaller than a nucleus. Confusion arose in the relative sizes of chromosome, gene and nucleotide.

Question 1 (b)

(b) The table shows the number of chromosomes that different animals have in each body cell.

Animal	Number of chromosomes in each body cell
Earthworm	36
Giant panda	42
Gorilla	48
Fly	8
Cat	38
Polar bear	74
Rat	42
Snail	24
Tiger	38

A student looks at the data and writes this conclusion:

"The larger the animal, the more chromosomes it has in each body cell."

Explain why the student is **not** correct.

Use **two** pieces of evidence from the table to support your answer.

.....

.....

.....

..... [2]

The majority of candidates were given 2 marks on this question. Candidates who did not obtain full marks often did not make a comparison between the numbers of chromosomes and just stated the data. For example, they wrote 'The student is wrong because cats are bigger than rats and cats have 38 chromosomes and rats have 42.'

Question 2 (a)

- 2 Cocker spaniels are a breed of dog.
The colour of their fur is affected by the alleles of one of their genes.

The black fur allele (**B**) is dominant. The brown fur allele (**b**) is recessive.

(a) Two cocker spaniels have a puppy.

- One of the parents has black fur and the alleles **Bb**.
- The other parent has brown fur and the alleles **bb**.

Calculate the probability that the puppy has black fur, using the Punnett square.

Probability = [4]

Around half of candidates obtained full marks on this question. Those who did not obtain full marks gave genotypes rather than alleles for gametes, did not perform the cross correctly, or worked out the probability using all eight squares rather than out of the four associated with the cross.

Exemplar 1

	Bb	bb
Bb	Bb	Bb
bb	Bb	bb

Probability = 5 out of 8 [4]

In this exemplar, the candidate has not correctly given the alleles that would be present in the gametes. It is not possible to give error carried forward for the cross based on the gametes this candidate has suggested. Furthermore, the candidate was not sure how to use the Punnett square to work out the probability. This candidate was not an isolated case – many others answered this question in a similar way.

Question 2 (b)

- (b) Complete the sentence to explain why many other fur colours and patterns are seen in cocker spaniels.

Put a ring around the correct option.

Many different fur colours and patterns are seen in cocker spaniels because most features are the result of **no genes** / **one gene** / **many genes**.

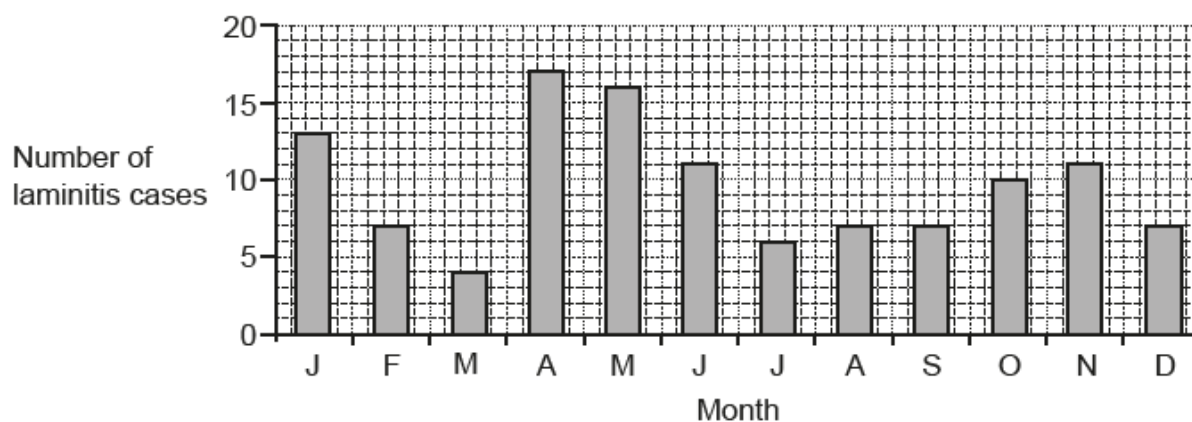
[1]

The vast majority of candidates answered this question correctly.

Question 3 (a)

3 Horses can develop a condition called laminitis.

The graph shows the number of laminitis cases in one area in one year.



(a) Complete the sentence.

A horse is **most** likely to develop laminitis in the month of

[1]

Almost all candidates were able to identify April as the month a horse would be most likely to develop laminitis. A few candidates incorrectly selected March.

Question 3 (b)

(b) How many cases of laminitis were there in February?

Number of cases = [1]

Most candidates correctly used the graph to deduce that there were 7 cases in February.

Question 3 (c)

(c) Plants can defend themselves against disease.

Which **two** describe plant defences against disease?

Tick (✓) **two** boxes.

Antibodies

☐

Cell walls

☐

Platelets

☐

Waxy leaf cuticle

☐

White blood cells

☐

[2]

It appears that there was confusion as to which defences against disease are found in animals and which are found in plants. Most candidates were able to give one plant defence against disease such as the waxy leaf cuticle, but many believed platelets were also part of a plant's defence.

Question 3 (d) (i)

(d) Ash dieback is a plant disease caused by a pathogen found in soil. It is easily spread from one tree to another.

(i) A boy goes cycling in a woodland where there is ash dieback.

Suggest **one** way in which the boy could prevent spreading the disease to another woodland.

.....
..... [1]

Just under half of candidates answered this question correctly. Responses that were not given credit included treating the trees with antibiotics, killing infected trees, vaccinating, isolating or treating the boy with antibiotics. When a novel context to a specification topic is presented and candidates are asked to apply their knowledge and understanding of scientific ideas, they should be encouraged to engage fully with the question and try not to just give generic responses.

Question 3 (d) (ii)

(ii) Which type of pathogen causes ash dieback?

Tick (✓) **one** box.Bacterium ☐Fungus ☐Virus ☐

[1]

The majority of candidates knew that ash dieback is caused by a fungus, although many thought that it was caused by bacteria.

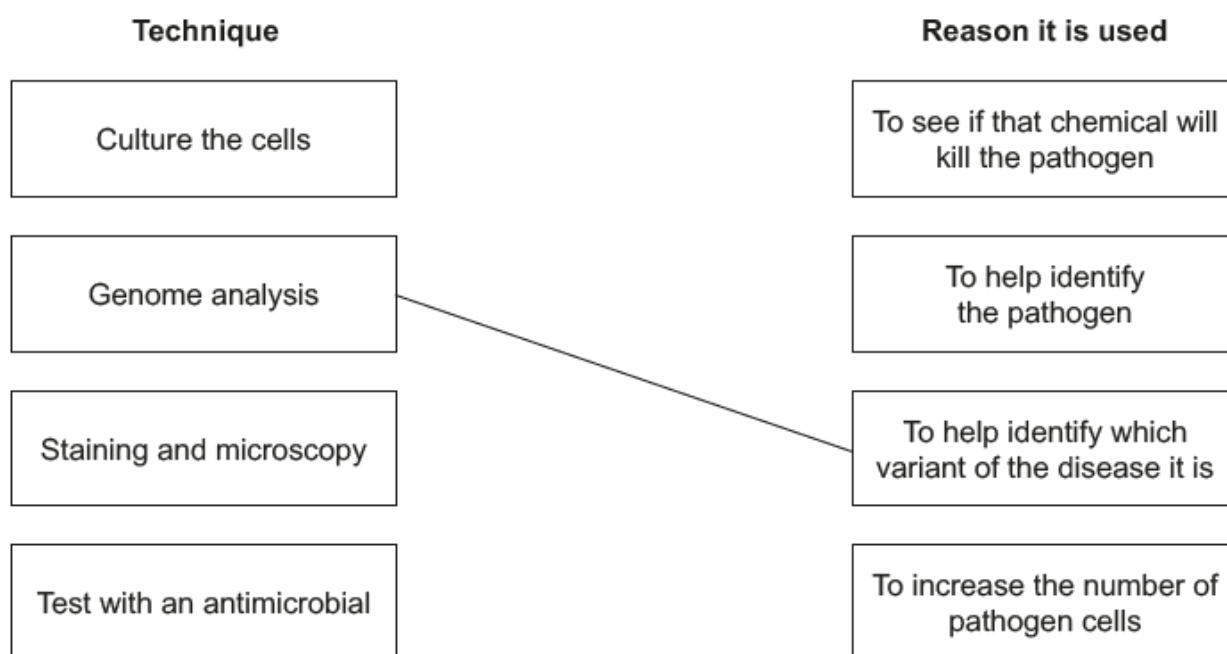
Question 3 (e)

(e) A scientist collects a sample of pathogen cells from a plant with a disease.

The scientist uses different techniques to try to work out how the disease can be treated.

Draw one line from each **technique** to the correct **reason it is used**.

One has been done for you.



[2]

All candidates attempted this question and almost all obtained both marks. For those not obtaining full marks, most were able to identify that testing with an antimicrobial is done to see if that chemical will kill the pathogen.

Question 4 (a)

4 (a) Complete the sentences to describe the process of photosynthesis.

Use words from the list.

carbon dioxide	chloroplast	glucose
hydrogen	oxygen	water

In the first stage of photosynthesis light and chlorophyll are needed to split

..... molecules into hydrogen and oxygen.

The is released to the atmosphere as a waste product.

The is transferred to the second stage where it combines with

..... to form glucose.

[4]

Candidates found this question challenging. Most obtained 1 or 2 marks, but few were able to demonstrate sound knowledge of both of the stages of photosynthesis. More candidates were given marks for knowing water is split into hydrogen and oxygen, and that oxygen is released as a waste product, than they were for knowing how glucose is formed in the second stage.

Question 4 (b)

(b) The glucose produced by plants can be stored as a large carbohydrate.

What is the name of this carbohydrate?

Tick (✓) **one** box.

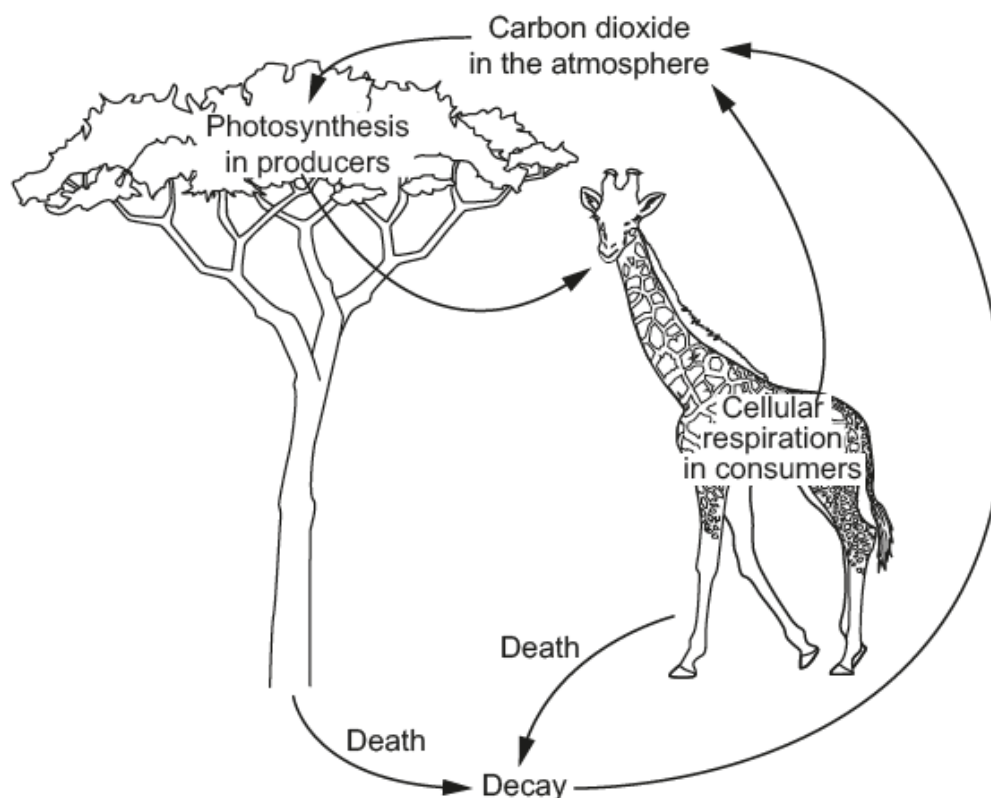
Fat	<input type="checkbox"/>
Glycerol	<input type="checkbox"/>
Protein	<input type="checkbox"/>
Starch	<input type="checkbox"/>

[1]

Around half of candidates selected 'starch'. Candidates who selected the incorrect molecule commonly chose 'glycerol'.

Question 5 (a) (i)

5 The diagram shows how carbon moves through parts of the carbon cycle.



(a) (i) Explain why photosynthesis in producers is important for **consumers**.

.....

.....

.....

..... [2]

More than half of candidates found this question very challenging and were unable to obtain any marks. The stem of the question introduced candidates to the topic of the carbon cycle, and used the terms producer and consumer but many candidates believed that the role of a producer is simply to provide oxygen to the consumer; an idea that was not credited.

Question 5 (a) (ii)

- (ii) Explain why cellular respiration in consumers is important for
- producers**
- .

.....

.....

.....

..... [2]

A common issue with this question was that candidates did not seem to understand the interaction between cellular respiration in consumers, carbon dioxide and photosynthesis. They focused on carbon dioxide being produced after death due to microbial activity, which did not answer the question.

Question 5 (b)

- (b) Some trees lose their leaves in autumn. These leaves fall to the ground and decay.

A student investigates the rate of decay of leaves. The table shows the results.

Initial mass of leaves (g)	Final mass of leaves (g)	Change in mass over 10 days (g)
20	9	11

Calculate the rate of decay.

$$\text{Rate of decay (g/day)} = \frac{\text{change in mass (g)}}{\text{number of days}}$$

Rate of decay = g/day [2]

Candidates performed well on this question. The most common issue was that the number of days was taken to be 11, rather than 10.

Question 6 (a) (i)

- 6 When a person swims in the sea and their body is surrounded by water, they are at risk of hypothermia.

Hypothermia is where body temperature falls below 35 °C.

- (a) A student investigates the effect of different water temperatures on the temperature of the body.

The student uses a test tube of red liquid at 37 °C to represent the human body.

- (i) Describe a method the student could use to investigate the effect that the surrounding water temperature has on the temperature of the red liquid in the test tube.

In your method describe:

- what the student should change
- what the student should measure.

.....

.....

.....

.....

.....

..... [3]

Although candidates were asked in the rubric to describe what they would change and what they would measure, few appreciated how this worked in the context of planning an investigation and therefore found this question very difficult. In terms of what they would change, rather than manipulating the independent variable, candidates thought that this meant how they should change the entire investigation and suggested things like using blood instead of the red liquid or using a real person in the sea. Candidates were better able to describe what they should measure, and some correctly noted that a water bath should be used.

Question 6 (a) (ii)

- (ii) Describe **one** thing the student should control in the method described in (a)(i).

.....

..... [1]

Few candidates were able to obtain the mark on this question. They often stated that the temperature of the surrounding water should be controlled. Some candidates knew that the volume of red liquid in the test tube should be controlled but they didn't use the correct term of 'volume' for this quantity, and just used the word 'amount' which was not given credit.

Question 6 (b)

(b) Why is a test tube of liquid **not** a good model of the human body?

.....
 [1]

Several plausible suggestions were given credit here, and just under half of candidates were given the mark. Common incorrect responses were a little too simplistic and stated that the test tube wasn't alive or that it was too small. Some candidates gave excellent answers showing a very good understanding of the concept of thermoregulation.

Question 7 (a)

7 The amount of water in the body should be kept constant.

(a) The table shows the amounts of water gained and lost from one person in one day.

Volume of water gained (ml)		Volume of water lost (ml)	
From drinks	1200	From lungs and skin	900
From food	900	In faeces	100
Product of respiration	300	In urine	

Calculate the volume of water needed to be lost in urine to maintain the water balance of the person's body.

Volume = ml [3]

Almost half of candidates were credited with full marks and many showed their working which meant that even if their final answer was incorrect, partial credit could be given.

Question 7 (b)

- (b) Complete the sentences to explain why it is important to control the amount of water in the blood.

Use words from the list.

active transport	burst	diffusion	fully
osmosis	partially	shrink	

The cell membranes of human body cells are permeable.

If there is too much water in the blood, water will enter the cells by

This may cause the cells to

[3]

Almost all candidates were credited with at least 1 mark on this question. Most knew that water enters the cells by osmosis, and some knew that too much water in cells can cause them to burst. The greatest difficulty was encountered in the first sentence; candidates thought that cell membranes are fully permeable.

Question 7 (c) (i)

- (c) Humans sweat when they are hot. Sweat contains water.

Some people have a condition that makes them produce too much sweat. A chemical called Botox can be used to treat this condition.

Botox stops the functioning of neurons that usually send nerve impulses to glands and muscles.

- (i) Which type of neuron is affected by Botox?

Tick (✓) **one** box.

Motor	<input type="checkbox"/>
Receptor	<input type="checkbox"/>
Relay	<input type="checkbox"/>
Sensory	<input type="checkbox"/>

[1]

A minority of candidates knew that motor neurons are affected by Botox. Many believed that receptors are neurons.

Question 7 (c) (ii)

- (ii) Suggest why some people may be concerned about using Botox to treat their condition.

.....
..... [1]

The majority of candidates found this question very challenging and were unable to obtain a mark. There were two main issues here; the first was that candidates simply re-wrote part of the stem of the question ('Botox stops the functioning of neurones that usually send nerve impulses to glands and muscles') as their answer; and the second was that because they had heard of Botox as a cosmetic procedure, they limited their response to concerns about the cosmetic use of Botox.

Question 7 (c) (iii)

- (iii) Botox is a protein.

Describe a test you could use to show that Botox is a protein.

.....
.....
.....
..... [2]

Even though testing for biological molecules is one of the compulsory practical groups (Practical Activity Group 2), the majority of candidates were unable to obtain any marks on this question. Around a quarter of candidates did not attempt a response. A common misunderstanding was that, as a protein, Botox was a food, so testing for its presence would involve eating it and observing any effects of this.

OCR support

This [Practical support guide](#) can be used with students in lessons or for revision. It contains practicals and questions that relate to the skills and apparatus for each Practical Activity Group and can help them familiarise themselves with practicals in unfamiliar contexts.

Question 8 (a) (i)

8 The table shows the length of the menstrual cycle for seven different females.

Female	Menstrual cycle length (days)
1	28
2	26
3	29
4	22
5	27
6	30
7	28

(a) (i) Calculate the **mean** menstrual cycle length.

Give your answer to the nearest **whole** number.

Mean menstrual cycle length days [3]

The majority of candidates were able to be given 3 marks on this question which illustrated the importance of showing working out in calculations. While a correct answer with no working out will obtain full marks, an incorrect answer with working may still gain 1 or more marks. Many candidates knew that they needed to add up the total number of days for the seven women in the first instance but weren't sure how to then calculate the mean although candidates were confident in rounding to a whole number.

Question 8 (a) (ii)

(ii) Calculate the **median** menstrual cycle length.

Median menstrual cycle length days [1]

The majority of candidates were able to correctly calculate the median.

22 26 27 28 28 29 30

Incorrect answers arose when candidates didn't realise they needed to include both 28s.

Question 8 (a) (iii)

- (iii) Sometimes ovulation does not occur and the menstrual cycle finishes early.

Which female in the table may not have ovulated?

Explain your answer.

Female

Explanation

.....

[2]

This question was answered well, with almost all candidates obtaining 1 mark for selecting woman 4 and the majority giving a good explanation and obtaining both marks. As with Question 1 (b), some candidates lost the second mark because they didn't make a comparison, for example they simply said 'her cycle was short' or 'her cycle was 22 days'.

Question 8 (b)

- (b) What is the role of hormones in sexual reproduction in humans?

.....

.....

.....

.....

[2]

A number of candidates did not attempt to answer this question. Nevertheless, there were some excellent responses using correct biological terms. The names and specific roles of the sex hormones are not on the Foundation specification, so candidates were not expected to provide this level of detail – although many did and were duly credited.

Misconception

A significant number of candidates confuse sexual reproduction with sexual intercourse.

Question 8 (c)

(c) Complete the table to describe different types of contraception.

Tick (✓) the correct boxes in each row.

Type of contraception	Prevents ovulation	Reduces the chance of pregnancy	Reduces risk of transmission of STIs
Condom			
Oral pill			

[3]

Most candidates obtained at least 1 mark on this question with around half being given all 3 marks. Some candidates did not understand the meaning of the term ovulation and believed condoms prevent ovulation. Others didn't realise both the oral pill and condoms reduce the chance of pregnancy. Most knew that only condoms reduce the risk of transmission of STIs.

Question 9

9 Complete the sentences about meiosis.

Use words from the list.

double	gametes	growth	half
interphase	one	three	two

Meiosis is a type of cell division that produces

During meiosis the chromosomes are copied in a stage called

This stage is followed by cell divisions which results in genetically different cells with the number of chromosomes.

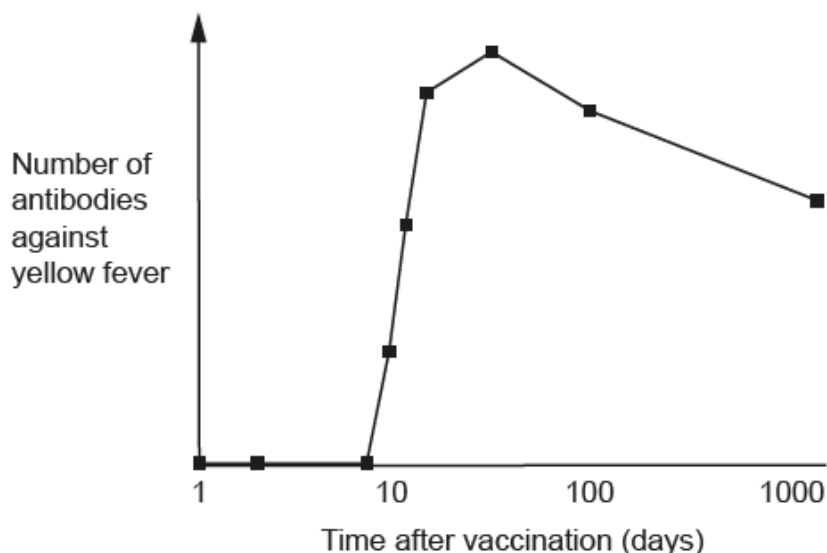
[4]

Almost all candidates attempted this question and more than three quarters obtained at least 2 marks. This was most often for correctly selecting gametes and interphase. The incorrect answer most seen was the last one – candidates selected double rather than half.

Question 10 (a) (i)

10 Yellow fever is a disease caused by a virus.

- (a)** A person is vaccinated against yellow fever. The graph shows the results of tests from this person.



- (i)** Explain how the vaccination caused this person's body to make antibodies against yellow fever.

.....

.....

.....

..... [2]

Candidates appear to find the topic of immunology challenging and on this question seemed to struggle to use the correct terminology. They tended to use the words pathogen and disease interchangeably and gave vague responses such as 'a vaccine contains dead parts of the disease' or 'dead cells from the yellow fever'. Some candidates did not answer the question and instead described how the number of antibodies changed over 1000 days. Others gave generic responses to do with memory cells or stated that the vaccine contained antibodies.

Exemplar 2

A vaccine ~~gives a~~ is a dose of a dead or in-active version of the illness. This makes the bodies immune system and in particular white blood cells act against the illness and creates memory cells for future use against the illness. [2]

This response is illustrative of many seen. The candidate clearly had an understanding of what is involved in vaccination, and knew that white blood cells are involved, but they were unable to obtain the first marking point because they used the word illness rather than pathogen or virus.

Question 10 (a) (ii)

- (ii) Suggest why the number of antibodies has not returned to zero, 1000 days after vaccination.

.....
.....
.....
..... [2]

Some candidates had the idea of preventing reinfection or appreciated that not all of the antibodies had been broken down by 1000 days, but a number of candidates were let down by their use of scientific language. As also seen in Question 10 (a) (i), a clear understanding of the meaning of terms such as pathogen, disease and infection was not always demonstrated. Antibodies persisting to 'fight disease' was commonly given as a response.

Misconception



Several misconceptions arose in this question, namely:

- antibodies and memory cells are the same thing
- vaccination destroys antibodies
- antibodies 'die'.

Question 10 (a) (iii)

- (iii) What is the **minimum** number of days after vaccination that somebody should wait before travelling to an area where yellow fever is common?

Explain your answer.

Number of days

Explanation

[2]

Around a third of candidates could deduce the minimum number of days before travelling and also provide an appropriate explanation. Candidates given 1 mark on this question generally obtained the mark for their explanation, appreciating that the presence of antibodies provided protection against infection by the yellow fever virus.

Question 10 (a) (iv)

- (iv) The yellow fever virus is carried by mosquitoes.

Suggest **two** ways, other than vaccination, to prevent the spread of yellow fever.

1

2

[2]

Candidates engaged well with this question and were able to offer reasonable suggestions to prevent the spread of yellow fever. A common response was to use insect repellent, but many referred to the removal of mosquito breeding sites. Only a few responses referred to isolation or wearing masks, i.e. generic strategies to limit the transmission of a pathogen.

Question 10 (b)

- (b) Why do we need to vaccinate a large proportion of the population to stop the spread of a disease?

.....

..... [1]

A minority of candidates answered this question correctly, often stating herd immunity. A few understood that not everyone can be vaccinated and that not everyone responds to vaccination, but many simply repeated the stem of the question.

Question 10 (c)

(c) Cancer is a different type of disease.

Which statements about cancer are **true**, and which are **false**?

Tick (✓) **one** box in each row.

	True	False
Cancer is a communicable disease.	<input type="checkbox"/>	<input type="checkbox"/>
Cancer can be caused by our environment and lifestyle.	<input type="checkbox"/>	<input type="checkbox"/>
Cancer is a result of changes in a cell's DNA.	<input type="checkbox"/>	<input type="checkbox"/>
Cancer is a result of cells dividing uncontrollably by meiosis.	<input type="checkbox"/>	<input type="checkbox"/>

[3]

Most candidates obtained at least 1 mark on this question, and commonly knew that cancer is not a communicable disease, rather it can be caused by environment and lifestyle. Fewer candidates knew that cancer is the result of changes in a cell's DNA.

Question 11 (a) (i)

11 (a) (i) Complete the table to compare cellular aerobic and anaerobic respiration in humans.

Tick (✓) the correct boxes in each row.

Process	It requires glucose	It requires oxygen	It produces carbon dioxide	It produces water	It produces lactic acid
Aerobic respiration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anaerobic respiration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[3]

Most candidates were given 1 mark for identifying two correct columns. Few knew that aerobic and anaerobic respiration both require glucose, and a number of candidates believed that both aerobic and anaerobic respiration produce water. Candidates generally knew that aerobic respiration requires oxygen and anaerobic respiration produces lactic acid.

Question 11 (a) (ii)

(ii) Which statement about respiration is correct?

Tick (✓) **one** box.

Aerobic respiration produces more ATP than anaerobic respiration.

☐

Anaerobic respiration produces more ATP than aerobic respiration.

☐

Both aerobic and anaerobic respiration produce the same amount of ATP.

☐

Neither aerobic or anaerobic respiration produces ATP.

☐

[1]

Half of candidates selected the correct answer, and almost all incorrect responses ticked the second box (anaerobic respiration produces more ATP than aerobic respiration).

Question 11 (b) (i)

(b) Heart muscle contains approximately 5000 mitochondria in every cell.

(i) Suggest why heart muscle cells need so many mitochondria.

.....

.....

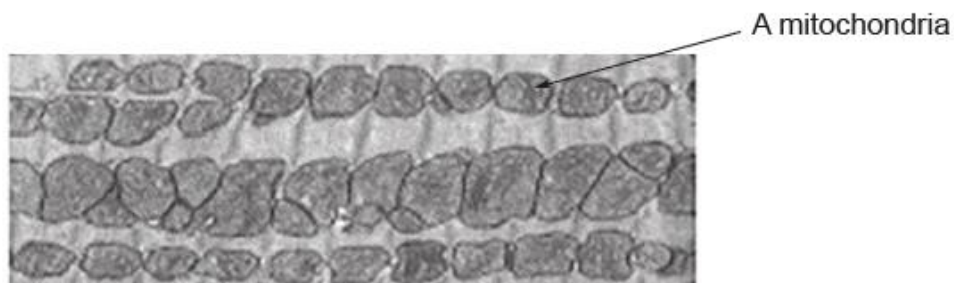
..... **[2]**

Some responses were quite simplistic, referring just to the function of the heart pumping blood. Others realised energy was involved but wrote answers such as 'mitochondria make energy for the heart'. Very few candidates stated that muscle needs ATP to contract.

Question 11 (b) (ii)

- (ii) The image shows the mitochondria in a section of heart muscle. The mitochondria are different sizes.

One of the mitochondria is labelled.



Estimate the number of mitochondria in this image.

Number of mitochondria = [1]

Candidates performed well on this question and were able to use the image to work out an appropriate estimate of the number of mitochondria.

Question 12 (a) (i)

12 The table shows the percentage of land covered in rainforest in a country.

Year	Percentage of land covered in rainforest (%)
1940	75
1950	72
1961	53
1977	31
1983	26
1987	21
1997	42
2000	45
2005	50

(a) (i) Describe the trend in the data.

.....

.....

.....

..... [2]

Candidates answered this question very well. Not only did they look closely at the data to identify the trend (there wasn't just a simple decrease, the percentage decreased then increased), they also supported their description with data which is always good practice. Candidates also described rather than attempted to explain the data – in the past confusion over the terms describe and explain has occurred, but this year candidates did as this question asked them.

Question 12 (a) (ii)

(ii) The government of the country started to protect areas of the rainforest and even paid people to regrow it.

Suggest when the government started to do this.

..... [1]

Many candidates misread the question and tried to explain why rather than when the government started to protect and regrow the rainforest with the result that only a minority obtained a mark.

Question 12 (a) (iii)

- (iii) Predict when the rainforest will reach the percentage land coverage seen in 1940, if it increases by the same rate as shown from 1997 to 2005.

Predicted year = [1]

Although most candidates attempted this challenging question, few were able to use the data correctly to predict the date.

Question 12 (b) (i)

- (b) A rainforest is one of the most biodiverse areas of the Earth.

- (i) Suggest why the government wants to continue to regrow the rainforest.

.....
.....
.....
..... [2]

Candidates connected well with this question and offered a wide variety of plausible suggestions with most obtaining at least one mark. Notable errors included using the word 'home' for habitat and writing that animals, rather than species, become extinct. Some candidates also seemed to think that plants producing oxygen in photosynthesis was more important than them acting as carbon sinks, suggesting for example that the government of the country wanted to regrow the rainforest to provide oxygen.

Question 12 (b) (ii)

(ii) Suggest **two** challenges of regrowing the rainforest.

1.
.....
2.
.....

[2]

There were some well considered responses to this question, showing that candidates had really interacted with the question and not just given non-specific answers. Although popular responses referred to time and cost, many candidates appreciated that there would be issues with the soil quality of deforested land, potential disruption to newly formed habitats and continued deforestation.

Question 12 (c)

(c) Some plants in the rainforest reproduce sexually, but others reproduce asexually.

Which statements describe sexual reproduction, and which describe asexual reproduction?

Tick (✓) **one** box in each row.

	Sexual reproduction	Asexual reproduction
Occurs at a slower rate		
Offspring are all susceptible to the same diseases		
Only one parent is needed		
Provides offspring with genetic variation		

[3]

The majority of candidates obtained 1 or 2 marks on this question. Most knew that only one parent is needed in asexual reproduction and that sexual reproduction provides offspring with genetic variation.

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