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Examiners' report

AS LEVEL

BIOLOGY A

OCR Level 3 Advanced Subsidiary GCE in Biology A

H020

For first teaching in 2023

H020/02 Summer 2025 series

Version 1

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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 responses 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 Teach Cambridge.

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Paper 2 series overview

This paper covers a broad range of AS Biology topics with two level of response questions. Evaluation skills were assessed in one question, with the other focussing on applying recall knowledge to source material. Mathematical skills were assessed across the paper, including R_f and Q_{10} values, the use of a tangent to determine the initial rate of reaction, interpretation of data with use of appropriate units and the use of significant figures. Questions covered a range of responses including recall, application, and evaluation. Most candidates attempted all questions with many also using the extra pages at the back of the paper.

Candidates who did well on this paper generally:	Candidates who did less well on this paper generally:
• answered all questions with very few non-responses seen • calculated the R_f value and determined an unknown carbohydrate • could describe the role of a solvent in chromatography • could explain the impact of increasing temperature on membrane permeability • could explain the impact of substrate concentration on enzyme activity • could recall the causes of variation • could recall key features of the mechanism of ventilation • could recall the features of the key components of the mammalian gas exchange system • showed clear workings in mathematical questions and rounded their answers to an appropriate number of significant figures • used precise scientific terminology, e.g. the inheritance of alleles responsible for the advantageous characteristics in natural selection.	• muddled the dependent and independent variables • did not draw an appropriate tangent to the trend line to determine the initial rate of reaction • did not use scientific terminology accurately, e.g. average versus mean, gene versus allele, indicator versus universal indicator • did not give (appropriate) units when quoting data • could not calculate the Q_{10} value • could not describe the relationship between classification and phylogeny • could not recall differences between the five kingdom and three-domain classification systems • could not accurately calculate breathing rate from data provided • described differences in spirometer traces when environmental factors change.

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Question 1 (a)

1

(a) The table describes features of molecules.

Complete the table. Use ticks (✓) to identify if the feature describes starch or cellulose.

Description	Starch	Cellulose
Is made of amylose and amylopectin		
Is a long unbranched chain		
Is made from β glucose molecules		

[3]

Most candidates were able to recall the features of starch and cellulose accurately. Some candidates seemed to mix up the two with completely inverse responses being given. Examiners noticed that most candidates read the stem of the question correctly and, as directed, only inserted ticks into the table.

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Question 1 (b)

(b) Students complete paper chromatography on carbohydrates.

The table shows the R_f values for known carbohydrates.

The table of the R_f values for known carbohydrates has been removed due to copyright restrictions.

The measurements recorded for an unknown carbohydrate were:

Distance travelled by solvent = 8.50 cm

Distance travelled by carbohydrate = 4.34 cm

Calculate the R_f value of the unknown carbohydrate and use the table to identify it.

Give your answer to **2** decimal places.

R_f value = ...

Name of carbohydrate = ...

[2]

Most candidates got both marks for this question. Those that did not usually gave a response that indicated they were unaware of how to calculate R_f values, rather than getting the mathematical process incorrect. Some candidates did not give their answer to two decimal places.

Calculation:

R_f = Distance travelled by pigment / distance travelled by solvent

R_f = 4.34/8.50 = 0.5106

R_f = 0.51 (in 2 decimal places)

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Question 1 (c)

(c) Outline the role of the solvent in paper chromatography.

.....

.....

.....

.....

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

Many candidates recalled that the solvent was the mobile phase and dissolved the carbohydrate (solute). Some candidates were vague in their responses, e.g. referring to separating colours or separating dyes.

Misconception

Poor use of scientific terminology was seen when trying to describe the role of the solvent in carrying the dissolved solute up the stationary phase/chromatography paper instead referring to the solvent 'pushing' or 'dragging' or 'pulling' the solute 'along' the paper.

Assessment for learning

This article is a useful resource for students to refer to when studying chromatography.

This useful video and animation can also be referred to for studying chromatography. Please note that you will need to create a free account to access this.

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Question 2 (a) (i)

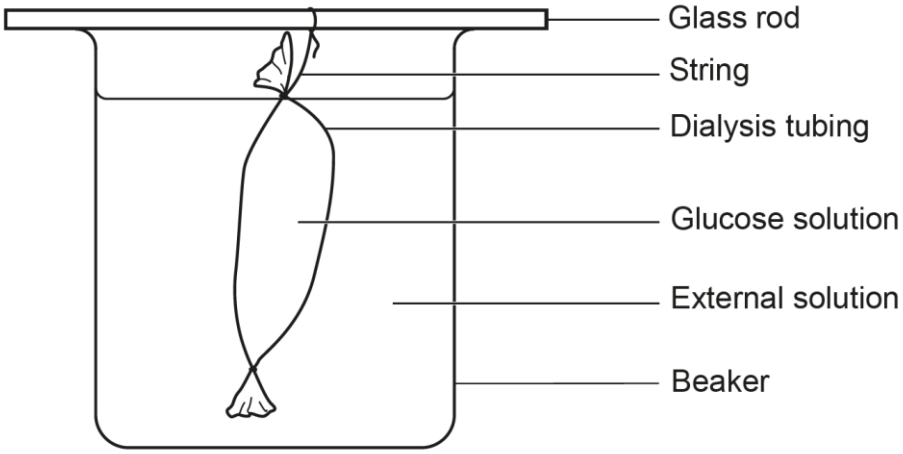
2

(a) Students use a model cell to investigate the effect of the thickness of the exchange surface membrane on the rate of diffusion across the membrane.

The students are provided with dialysis tubing of different thicknesses, grade 1, grade 3 and grade 5, where grade 5 is the thickest.

They set up the apparatus as shown.

The students remove a sample of the external solution at 30 second intervals and determine th concentration of glucose (mmol dm^{-3}) in the sample.



The table shows their results.

Grade of dialysis tubing	Concentration of glucose found in the samples of external solution taken at 30 s intervals (mmol dm^{-3})				
	0 s	**30 s**	**60 s**	**90 s**	**120 s**
1	0.00	1.31	2.52	3.59	4.80
3	0.00	0.82	2.24	2.39	3.31
5	0.00	0.31	0.64	0.96	1.22

(i) Identify the independent variable **and** the dependent variable in this experiment.

Independent variable

.....

.....

Dependent variable

.....

.....

[2]

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Many candidates got both marks for this question. Good practice was used by some candidates who gave the full details of the dependent variable, making use of the column headings given the results table, i.e. 'Concentration of glucose found in the samples of external solution taken at 30s'.

Misconception

Some candidates were unable to correctly identify the independent (IV) and dependent variable (DV) in the investigation. Some gave the DV as the IV and vice versa.

OCR support

The Language of measurement resource for Biology can be a useful resource to support students with written assessed practical skills.

Question 2 (a) (ii)

(ii) Suggest **two** improvements to this experiment to increase the accuracy of the results.

Improvement 1 .....

.....

Improvement 2 .....

.....

[2]

While many candidates got marks here, some candidates were too vague in their responses, simply stating 'repeat the investigation' or 'use more grades of tubing'. Candidates should make it clear that the investigation should be repeated **with** additional, specified grades of tubing. Some candidates also used the term average rather than mean.

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Question 2 (a) (iii)

(iii) Suggest a conclusion that can be drawn from the data in the table.

You should give evidence to support your conclusion.

.....

.....

.....

.....

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

Most candidates got at least 1 mark here for the use of data. Those that did not usually made errors with the units by either not providing any units or inaccurately writing units for the concentration. Those students who got both marks successfully referred to both the independent variable (grade of dialysis tubing) and the impact on the rate of diffusion.

Exemplar 1

As dialysis tubing thickness increases, concentration ~~outside~~ of glucose in the external solution decreases, this is shown where at grade 1 its 4.8 at 120s and at grade 5 its 1.22 at 120s. This suggest glucose diffusion is more effient with a short diffusion pathway **[2]**

In this exemplar, the candidate did not link the increased concentration of glucose in the external solution with an increase in the rate of diffusion. The first sentence in the response is a description of the findings rather than a conclusion. The candidate has compared two concentrations of glucose at a set time period, but the absence of units for the glucose concentration means the mark cannot be given. The exemplar scored 0 marks.

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Question 2 (b)

(b) State **one** similarity and **one** difference between simple diffusion and facilitated diffusion.

Similarity .....

.....

Difference .....

.....

[2]

Most candidates were able to recall one similarity between the two methods of transport. However, many did not refer to the movement of molecules and simply stated responses such as 'both go down a concentration gradient'. Examiners could not interpret statements which did not specifically refer to the movement of molecules down the concentration gradient.

Assessment for learning



When referring to differences between two processes/methods, etc. the response should be comparative. For example, 'only facilitated diffusion uses carrier proteins' or 'facilitated diffusion uses channel proteins but simple diffusion does not'. Statements such as 'Facilitated diffusion uses transport proteins' is not comparative and so does not get credit.

Misconception



A very common misconception was that simple diffusion was a passive process whereas facilitated diffusion uses energy or ATP. Both processes are passive and do not require an input of energy.

Question 2 (c)

(c) Using your knowledge of the phospholipid bilayer in plasma membranes, explain how an increase in temperature affects the permeability of the membrane.

.....

.....

.....

.....

.....

..... **[3]**

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Some candidates were able to give detailed responses referring to the gain of kinetic energy, the increase in the number/size of gaps between phospholipid molecules and the subsequent increase in permeability. Often candidates focused on the protein component of the membrane and incorrectly linked the gain in temperature to the denaturation of enzymes leading to a change in permeability.

Question 2 (d)

(d) Exocytosis is an active process.

Explain why ATP is needed for exocytosis.

.....

.....

.....

.....

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

Some candidates could successfully explain how ATP is hydrolysed to release energy, which is subsequently used to enable motor proteins to internally move the vesicle to the cell surface membrane and then fuse the membrane of the transport (secretory) vesicle to the cell surface membrane.

Misconception



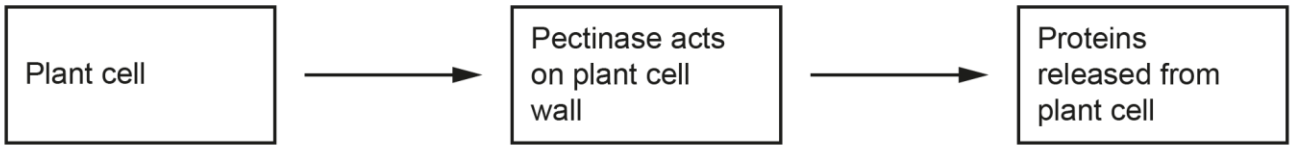
Some candidates referred to the production of energy and its use in moving molecules against a concentration gradient, both of which were incorrect.

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Question 3 (a) (i)

3
(a)
(i) Enzymes can be used to extract proteins from plant cells. These proteins can be used for food products.

The diagram shows how the enzyme pectinase can be used to extract some plant proteins.



Complete the sentences using the most appropriate term(s).

Use the diagram and your knowledge of enzymes.

In living organisms, enzymes usually speed up reactions involved in the

..... of the cells.

From the location of the enzyme pectinase shown in the diagram, the action of pectinase can be

described as ..... .

[2]

Many candidates recalled that the enzymes speed up metabolism/metabolic reactions. Fewer candidates were able to accurately describe the action of pectinase with 'catalytic' being a common incorrect response. Generic answers such as 'catalytic' and 'faster' were not specific enough in describing the mode of action.

Question 3 (a) (ii)*

(ii)* The table shows some data on different methods that can be used to extract plant proteins.

Protein source	Extraction method	Percentage yield of protein extracted
Mung beans	chemical only	77.3
Potatoes	chemical and enzyme assisted	88.8
Soya beans	chemical only	48.7
Split peas	chemical and enzyme assisted	80.7

A student concluded:

'The data proves that the enzyme assisted extraction method always gives a greater yield of plant protein'.

Evaluate this conclusion.

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.....

.....

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.....

.....

..... **[6]**

This was the first of two 6-mark levels of response questions on the paper. This style of question requires specific skills and candidates need guidance in how to assess what the question is asking for and how to structure their response.

Many candidates were able to give a balanced response to the question, providing statements supported by data quotes which both supported and undermined the conclusion. Successful candidates also gave an overall decision/view on if, on balance, there was more evidence to support or undermine the conclusion.

Less successful candidates did not refer to, or quote, data from the table.

Assessment for learning

Candidates should be encouraged to structure their response in two sections to improve their communication.

OCR support

The guide to Level of response questions is a great support for teachers and students on how to approach this type of questions.

Our assessment story guidance takes you through our approach in our assessments and it also includes a list of command words on page 12.

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Question 3 (b) (i)

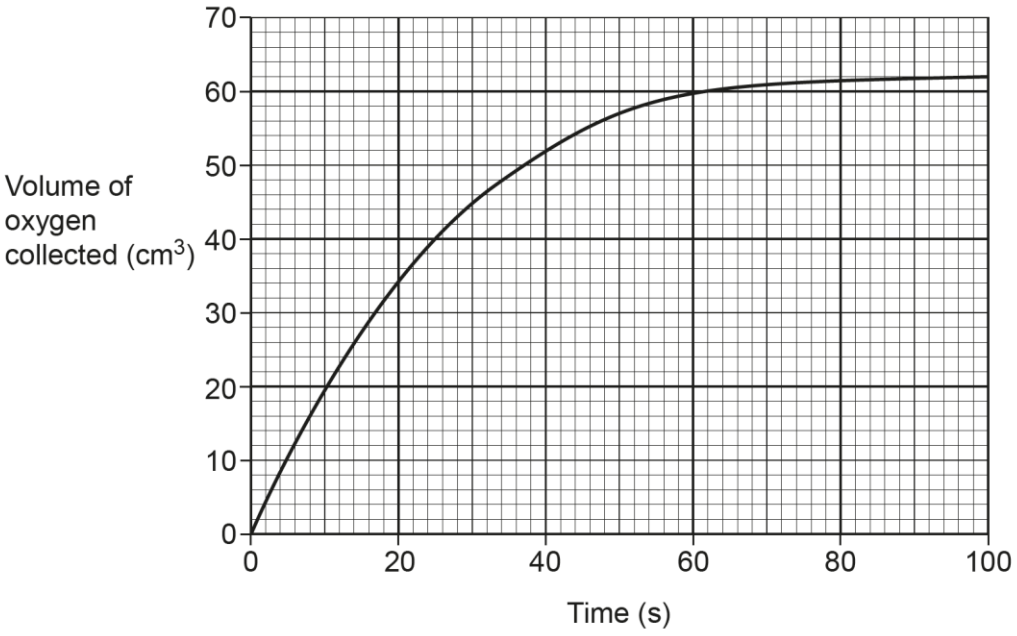
(b) Peas can be used in experiments as a source of catalase.

Catalase is an enzyme that catalyses the breakdown of hydrogen peroxide to water and oxygen gas.

A student mashes some peas in distilled water to release the catalase.

They investigate the effect of temperature on the rate of the enzyme reaction.

The graph shows the results they obtain at 20 °C.



(i) Use the graph to calculate the initial rate of the reaction.

Give your answer to **2** significant figures.

Initial rate of the reaction = ... $cm^3 s^{-1}$ **[3]**

Many candidates were unable to demonstrate the ability to draw a tangent in the appropriate section of the curve (0-8s) to determine the **initial** rate of reaction. Many also did not give their answer to two significant figures.

Calculation:

To calculation initial rate a tangent has to be drawn between 0s and 8s. The gradient of the line needs to be calculated.

Gradient = change in y / change in x

Initial rat = 16/8 = 2.0 cm^3 s^{-1}

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Assessment for learning

Our OCR 'Maths for Biology' resources include a set of tutorials and quizzes for every math skill required for A Level Biology. The tutorial and quiz 'M1.1 – Use an appropriate number of significant figures' can be shared with students to support them with this specific mathematical skill.

This question could be used in teaching in conjunction with the Biology Mathematical Skills Handbook dealing with M3.5 on page 54.

A useful resource for teachers and students in understanding significant figures and decimal places can also be found here.

Question 3 (b) (ii)

(ii) The student repeats this experiment at 30 °C and finds the initial rate of reaction to be 4.34 $cm^3 s^{-1}$.

Calculate the Q_{10} for catalase.

Give your answer to **2** significant figures.

Q_{10} for catalase = ... **[1]**

Few candidates could use the two initial rates of reaction to calculate and accurately record the Q_{10}.

The same errors in the last question on using significant figures were also seen in this question.

Calculation:

Q_{10} = Rate $_2$ / Rate $_1$

Q_{10} = 4.34 / 2.1 = 2.06666

Q_{10} = 2.1 (2 significant figures)

OCR support

Correctly rounding values is discussed in maths skills handbook as well as the 'Maths for Biology' resources.

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Question 3 (c)

(c) The student completes a different experiment to investigate the effect of pH on enzyme action.

Suggest how they would vary **and** detect the pH in their experiment.

.....

.....

.....

.....

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

Many candidates got 1 mark on this question, usually for the suggestion of how to detect the pH. That said, some responses were too vague, e.g. 'use a pH test kit' or 'use indicators'. These responses were not given marks.

Candidates who did well on this question were able to provide suitable details of how to change the pH, for example, the use of multiple buffer solutions (at different pHs) or the use of acid and alkaline solutions to vary the pH. Some candidates referred to solutions of 'H^+ and OH^- ions' which was not sufficiently detailed to get marks.

Question 3 (d)

(d) Explain how increasing the substrate concentration affects the enzyme activity.

.....

.....

.....

.....

.....

..... **[4]**

Most candidates got most of the marks on this question, with many referring to increased successful collisions, more enzyme-substrate complexes and an increased rate of enzyme activity.

Misconception

Some candidates used incorrect science when referring to high concentrations of substrate resulting in Vmax, by stating that the rate of reaction *decreased* as opposed to the rate of reaction reaching a plateau.

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Question 4 (a) (i)

4
(a)
(i) The European dust mite is an insect with the binomial name *Dermatophagoides pteronyssinus*.

State **one** advantage of the binomial naming system.

.....

.....

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

Candidates found it difficult to phrase their response for this question. Many simply said it 'is universal' without expanding on this statement to say how this relates to the naming system. Others also stated that the system was used to *identify* or *recognise* the organism.

Question 4 (a) (ii)

(ii) Complete the table with the names of the taxa for the European dust mite.

Taxa	Name
Kingdom	
Genus	
Species	

[2]

Most candidates got at least 1 mark here, usually for correctly identifying the genus and the species. Spelling errors (for Animalia) or the incorrect kingdom were the most common reason for candidates not getting both marks. A common incorrect answer for kingdom was insect.

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Question 4 (b)

(b) Organisms were originally classified into five kingdoms.

State **two** general features of organisms classified in the Plantae kingdom that are **not** features of organisms that are classified in the Fungi kingdom.

Feature 1 .....

.....

Feature 2 .....

.....

[2]

Most candidates got at least 1 mark for this question. Those candidates who did not get marks here often referred to the presence of a cell wall but did not qualify their response by saying what it was made of or simply referred to vacuoles.

Question 4 (c)

(c) State the relationship between classification and phylogeny.

.....

.....

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

Candidates found it hard to express their responses in this question with many simply stating definitions rather than the actual relationship between the two terms. Some switched the terms; incorrectly writing that phylogeny depended on classification.

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Question 4 (d)

(d) State **two** differences between the five kingdom and three domain classification systems.

1 .....

.....

.....

2 .....

.....

.....

[2]

This question was a discriminating question; most candidates did not answer it well. More successful candidates usually referred to the three-domain system using six kingdoms and accurately recalled the names of the three domains. Many candidates referred to the dates at which the two systems had been proposed referring to the three-domain system being more recent. This was not given credit as it is not a feature of the classification system.

Assessment for learning

A useful resource on the three versus two domain system of classification can be found here

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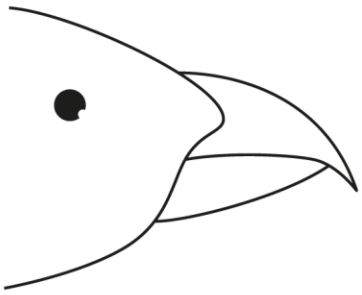
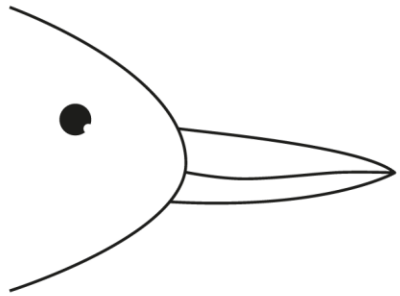
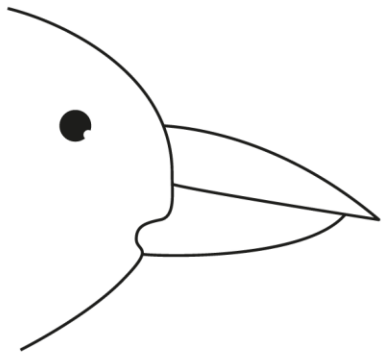
Question 4 (e)*

(e)* Darwin observed birds called finches on the Galapagos Islands.

All the different species of finches evolved from one species of finch that arrived from mainland South America about one million years ago.

The table shows the type of beak and the preferred food of three of the finch species.

Each of these three finch species lives in a different environment.

Finch species	Diagram of beak shape	Beak type	Food
Vegetarian finch		Crushing beak with biting tips	Buds, leaves and fruit growing on trees
Warbler finch		Probing beak with probing tips	Flying insects and grass dwelling insects
Cactus finch		Probing beak with crushing tips	Cactus flowers and nectar

Using the information in the table, explain Darwin's theory of evolution by natural selection.

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.....

..... **[6]**

In order to do well in this question, candidates needed to study the given information carefully. Less successful responses described the process of natural selection with no direct reference to the diagram of the finches and the features of their beaks. More successful responses applied the principles of natural selection specifically to the evolution of different beaks, for example, the use of a long, probing beak to be able to access the nectar from the cactus flowers without being harmed by the spiny leaves.

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Exemplar 2

Using the information in the table, explain Darwin's theory of evolution by natural selection.

Darwins theory of evolution by natural selection explains that over millions of years ~~xxxxxxxxx~~ natural selection has occured due to caused by random mutation those with the most advantageous alleles, surviving and reproducing to produce offspring with those same advantagous alleles. Essentially survival of the fittest. This is evident in his study of finches as the finches with the most suited beak for their preferred food, are the ones who survive adapted to their environment and reproduce as they are the ones able to access the food. For example natural selection has occured in the evolution of different types of finches. For the vegetarian finch it has a crushing beak with biting hips as its food is fruit growing on trees that it will need to bite down hard on. For the warbler finch its adapted a probing beak with probing hips perfect for catching flying insects + grass insects as the beaks smaller and longer. Lastly the Cactus finch also has a... **[6]**

Extra answer space if required.

probing beak but with crushing hips as its food it cactus flowers and nectar. Its beak is perfectly suited to avoid the spines on a cactus. This is evidence of evolution by natural selection as those with the most advantages beaks for their environment will survive. This is because they are able to beat the selection pressures which in this case will be the type of food available to them. These selection pressures would have killed those finch whos beaks did not adapt to the the type of food they need to eat. So they are not naturally selected.

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This exemplar has a detailed explanation of natural selection, including details such as the process taking place over millions of years, the principle of survival of the fittest, the role of the advantageous allele and food sources acting as a selection pressure. The candidate also used information from the table, and, rather than just quoting the name and type they use to feed on the food sources, the candidate also applied their knowledge to how the beak is suitable for that food source. For example, the cactus finch having a long beak to avoid the cactus spines and the probing beak of the warbler finch being smaller and longer to catch flying insects. This response was given Level 3.

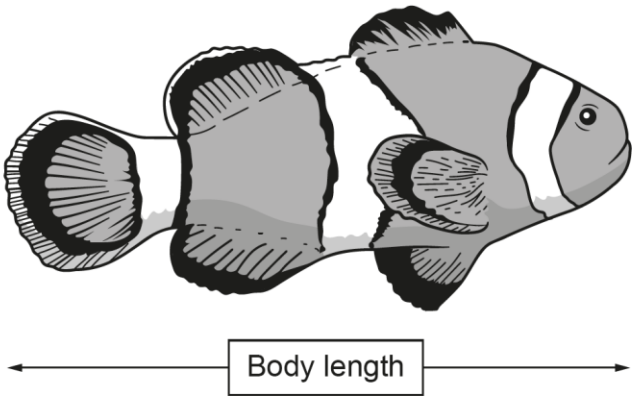
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Question 5 (a) (i)

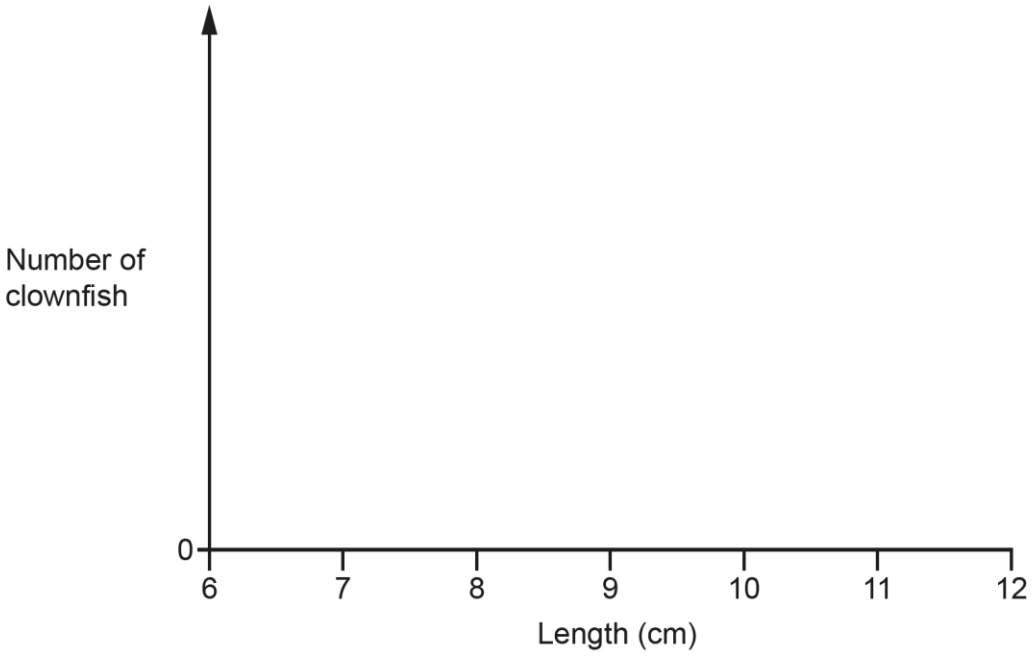
5

(a) Clownfish, *Amphiprion ocellaris*, live in the Indian Ocean. They have a mean body length of 8 cm.

A student looks at data on variation in the body length of adults in a species of clownfish.



(i) Using the axes, sketch the shape of the graph you would expect the student to find.



[1]

More successful candidates were able to use the information in the stem of the question to deduce that the peak of the trend line would be at 8cm and then draw a typical normal distribution curve with symmetry about the mean. Many candidates drew the peak at 9cm, presumably assuming the mean would be in the centre of the x-axis. There were some candidates that drew a trend line depicting that of the effect of temperature on enzyme-based reactions with a sudden decline after the peak.

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Question 5 (a) (ii)

(ii) Individuals in a population show variation.

Name **two** causes of variation.

Cause 1 .....

.....

Cause 2 .....

.....

[1]

Many candidates got the mark here, but those that did not often gave responses which were superficial, for example, referring to meiosis without any further explanation.

Question 5 (b)

(b) Clownfish are multicellular bony fish.

Explain why multicellular organisms need a specialised exchange surface.

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

This question was generally well answered, with most candidates getting 1 mark for recognising that large multicellular organisms have a small SA:V. However, many candidates stated they had a large SA:V, which is not correct. Some candidates referred to the increased metabolic demand of the multicellular organism but did not then link this to the rate of diffusion being too slow to meet this.

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Question 5 (c)

(c) State **one** feature that both gill lamellae **and** root hairs have that makes them efficient as an exchange surface.

.....

.....

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

A common misconception for this question was to refer to both the gill lamellae and root hairs having thin cell walls, rather than the exchange surface being thin. Many candidates successfully referred to the large surface area of both surfaces.

Question 5 (d)

(d) Explain why bony fish need water to flow over their gills for gaseous exchange to take place.

.....

.....

.....

.....

.....

..... **[4]**

Many candidates answered this question well. There was good evidence that candidates could recall the advantages of the counter current exchange system. Some candidates, however, gave details that did not answer the question for example the movement of the operculum and subsequent volume and pressure changes.

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Question 6 (a) (i)

6

(a) Spirometer readings were taken from a person at rest and during exercise.

- Their tidal volume at rest was 480 cm^3.
- Their ventilation rate at rest was 5 dm^3 per minute.
- During exercise their tidal volume increased by 70%.

(i) Calculate the breathing rate of the person at rest.

Give your answer to the nearest whole number.

Breathing rate = ... breaths per minute **[2]**

This question discriminated well, with many candidates incorrectly calculating the breathing rate. The most common incorrect answer was 96 (480/5). Some candidates correctly used the ventilation rate and tidal volume to calculate the breathing rate but did not give their answer to the nearest whole number.

Calculation:

Breathing rate = ventilation rate / tidal volume

Ventilation rate = 5dm^3 per minute = 5000cm^3 per minute

Breathing rate = 5000cm^3/ 480cm^3 = 10.4167 = 10

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Question 6 (a) (ii)

(ii) Calculate the person's tidal volume during exercise.

Tidal volume during exercise = ... cm^3 **[1]**

This question was correctly answered by most candidates.

Calculation:

Increase in tidal volume = 480 x 70% = 336cm^3

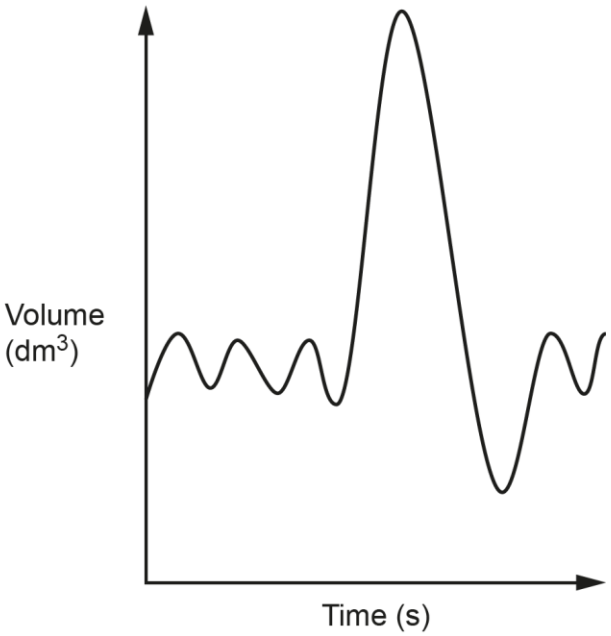
New tidal volume = 480 + 336 = 816cm^3

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Question 6 (b)

(b) A study shows that long term exposure to dust affects a person's lung function by reducing their vital capacity.

The graph shows a spirometer trace for a person with healthy lung function.



Suggest how a spirometer trace would be different for a person with long term exposure to dust.

.....

.....

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

This was another discriminating question. The command word 'suggest' provided a challenge for candidates to think creatively using their existing knowledge. The most common response was to state the impact on the tidal volume and vital capacity, but this did not address the question. Candidates needed to describe how the actual trace (line) would change and make it clear which peak and trough they were referring to.

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Question 6 (c)

(c) A student makes the following statement about ventilation in humans:

"During inspiration the diaphragm contracts and flattens. Internal intercostal muscles contract, moving the ribs upwards. The volume of the thorax increases, so the pressure in the thorax is now higher than atmospheric pressure. This forces air into the lungs."

Identify **and** correct the **two** errors in this statement.

Error and correction 1 .....

.....

.....

Error and correction 2 .....

.....

.....

[2]

Most candidates identified the errors in the statement, but some found it difficult to correct those errors. Some candidates referred to the internal intercostal muscles relaxing, but this would not move the ribcage upwards so this was not given credit. Another common incorrect response was to change the *volume* of the thorax to decrease, but this again would not be correct for inspiration.

Some candidates did not get marks since they only provided the correction to the statement and did not also identify the error in the statement.

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Question 6 (d)

(d) The table shows components in the mammalian gaseous exchange system.

Complete the table by stating **one** role of each component.

Components	Role
Incomplete rings of cartilage in the trachea	
Smooth muscle in the bronchioles	
Elastic fibres in the alveoli	

[3]

This was an accessible question which was attempted by almost all candidates. However, candidates often used colloquial wording in their answers and lacked precise use of scientific terminology. For example, in row three, answers often referred to the alveoli stretching but not also recoiling. Likewise in row two, answers often referred to the bronchioles themselves contracting and relaxing. Candidates should be encouraged to be as precise as possible with their terminology.

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Exemplar 3

Components	Role
Incomplete rings of cartilage in the trachea	Prevent collapse of the trachea during ventilation
Smooth muscle in the bronchioles	Allows contraction of the bronchioles to prevent pathogens from reaching the alveoli.
Elastic fibres in the alveoli	Allow alveoli to stretch as air enters and recoil to help push it out.

In this exemplar, this candidate got marks for row one and row three, but, due to the imprecise use of scientific terminology in row two, they do not get the mark for the role of the smooth muscle in the bronchioles. The smooth muscle contracts and relaxes to bring about the constriction and dilation of the lumen of the bronchiole.

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Question 3, Table to show some data on different methods that can be used to extract plant proteins, © Yu J, Wang L, Zhang Z. Plant-Based Meat Proteins: Processing, Nutrition Composition, and Future Prospects. Foods. 2023 Nov 20;12(22):4180. doi: 10.3390/foods12224180. PMID: 38002236; PMCID: PMC10670130. Reproduced under the terms of the Creative Commons Attribution 4.0 International Licence.

Question 4, Binomial name for the European dust mite, Wikipedia, en.wikipedia.org/wiki/Dermatophagoides_pteronyssinus

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