

1(a). Scientists have collected an animal from deep in the ocean.

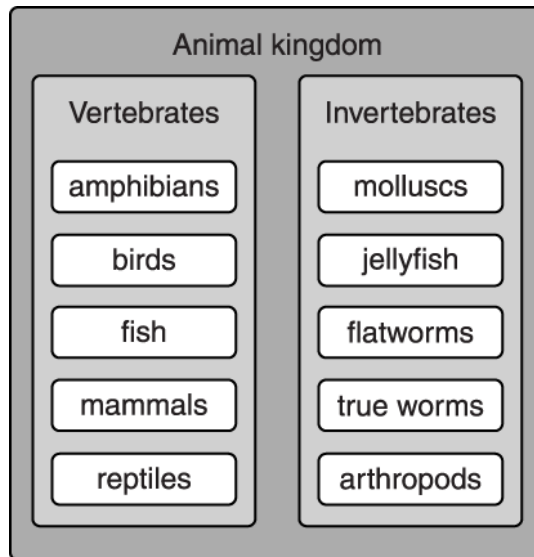
This species of animal has never been seen before.

It will have to be classified into a group in the animal kingdom.

What is meant by the word *species*?

[2]

(b). The diagram shows some groups of animals in the animal kingdom.



The animal discovered in the deep ocean is an invertebrate. It is similar to a jellyfish.

Put a tick (?) in the correct box next to each statement to show whether it is **true** or **false**.

Use the diagram to help you.

	True	False
All jellyfish are invertebrates.	<input type="checkbox"/>	<input type="checkbox"/>
Jellyfish are a type of fish.	<input type="checkbox"/>	<input type="checkbox"/>
The newly discovered animal could be a mammal.	<input type="checkbox"/>	<input type="checkbox"/>
All animals are vertebrates.	<input type="checkbox"/>	<input type="checkbox"/>

[2]

2(a). The process of evolution has produced many new species.

Explain how evolution produces new species.



The quality of written communication will be assessed in your answer.

[6]

(b). A team of scientists are looking for new species in the Amazon jungle.

They discover an unusual beetle.

Explain what would prove that it was a new species.

[2]

(c). Classification of living organisms can be very useful to scientists.

Put ticks (✓) in the boxes next to the **two** best reasons why.

Classification helps to ...

... make sense of the enormous diversity of organisms on Earth.

... increase biodiversity.

... improve sustainability.

... reduce the number of disease causing predators.

... show the evolutionary relationships between organisms.

[2]

END OF QUESTION PAPER

Question		Answer/Indicative content	Marks	Guidance															
1	a	a group of organisms that can breed (1) to produce fertile offspring (1)	2	Examiner's Comments Some candidates had clearly learnt the definition of a species and as such gained both marks for this question. Those candidates gaining only one mark often lost a mark for failing to identify that the offspring would be fertile. Many candidates resorted to intuitive notions of a species, such as 'a type of animal/plant', which have 'lots of similarities and are classified together'.															
	b	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 15%; text-align: center;">T</th> <th style="width: 15%; text-align: center;">F</th> </tr> </thead> <tbody> <tr> <td>All jellyfish are invertebrates.</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Jellyfish are a type of fish.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>The animal could be a mammal.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>All animals are vertebrates.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </tbody> </table>		T	F	All jellyfish are invertebrates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Jellyfish are a type of fish.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The animal could be a mammal.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All animals are vertebrates.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<p>Ignore any row in which there is more than one tick Four correct = 2 marks Two or three correct = 1 mark One correct = 0 marks</p> <p>Examiner's Comments This question was answered well. The majority of candidates scored one mark for this question through the identification that 'all jellyfish were invertebrates' and that they are not a type of fish or that 'not all animals were vertebrates'. The most common error noted was that candidates thought that the newly discovered animal could be a mammal.</p>
	T	F																	
All jellyfish are invertebrates.	<input checked="" type="checkbox"/>	<input type="checkbox"/>																	
Jellyfish are a type of fish.	<input type="checkbox"/>	<input checked="" type="checkbox"/>																	
The animal could be a mammal.	<input type="checkbox"/>	<input checked="" type="checkbox"/>																	
All animals are vertebrates.	<input type="checkbox"/>	<input checked="" type="checkbox"/>																	
		Total	4																

Question		Answer/Indicative content	Marks	Guidance
2	a	<p>Level 3 (5–6 marks) Gives a description of evolution AND speciation using key terms.</p> <p>Quality of written communication does not impede communication of the science at this level.</p> <p>Level 2 (3–4 marks) Gives a description of evolution OR speciation using key terms.</p> <p>Quality of written communication partially impedes communication of the science at this level.</p> <p>Level 1 (1–2 marks) Makes a simple statement about evolution OR speciation</p> <p>Quality of written communication impedes communication of the science at this level.</p> <p>Level 0 (0 marks) Insufficient or irrelevant science. Answer not worthy of credit.</p>	6	<p>This question is targeted at grades up to C</p> <p>Indicative scientific points on Evolution may include</p> <ul style="list-style-type: none"> • Natural selection • variation • mutation • competition • selective survival / survival of best adapted / survival of fittest • reproduction • pass on characteristic / genes <p>Indicative scientific points on Speciation may include</p> <ul style="list-style-type: none"> • population gets split into two groups (eg new mountain range or new river etc) • reproductive isolation • different / changed environments • split populations become different • different species can not interbreed (eg due to mating seasons / courtship / genetic incompatibility) <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p> <p>Examiner's Comments</p> <p>This question was common with the higher tier paper. Candidates were asked to explain how evolution produces new species. Many of the candidates who gained marks on this question did so for answers relating to natural selection.</p>

Question		Answer/Indicative content	Marks	Guidance										
	b	not breed with other beetles; to produce fertile offspring; check DNA; look for similarities / compare with others (in DNA)	2	ignore reference to comparing characteristics NB DNA is unknown = 2 marks Examiner's Comments This question asked the candidates to explain how they would prove that an unusual beetle was a new species. Very few candidates gained marks on this, only a few suggested checking the DNA.										
	c	<table border="1"> <tr> <td>make sense of the enormous diversity of organisms on Earth.</td> <td>✓</td> </tr> <tr> <td>increase biodiversity.</td> <td></td> </tr> <tr> <td>improve sustainability.</td> <td></td> </tr> <tr> <td>reduce the number of disease causing predators.</td> <td></td> </tr> <tr> <td>show the evolutionary relationships between organisms.</td> <td>✓</td> </tr> </table>	make sense of the enormous diversity of organisms on Earth.	✓	increase biodiversity.		improve sustainability.		reduce the number of disease causing predators.		show the evolutionary relationships between organisms.	✓	2	if more than two boxes are ticked, deduct one mark for each additional tick Examiner's Comments In this question, candidates were asked to indicate the two best responses regarding classification. This was a well answered final question.
make sense of the enormous diversity of organisms on Earth.	✓													
increase biodiversity.														
improve sustainability.														
reduce the number of disease causing predators.														
show the evolutionary relationships between organisms.	✓													
		Total	10											