OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



EXAM QUESTION PACK

B6.4 HOW IS BIODIVERSITY THREATENED AND HOW CAN WE PROTECT IT? (HIGHER)

SCORE	PERCENTAGE
/54	%

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1(a). Limpets are molluscs that are found on rocky shores.



Limpet

A student wants to find out if there is a different population of limpets on different parts of the shore.

Describe a method that the student could use to find out which parts of the rocky shore have more limpets.

--- [3]

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(b). The students counted the number of limpets found on three parts of the rocky shore. The results are shown in the table below.

Part of shore	Number of limpets			Mean
	Test A	Test B	Test C	
Low shore (closest to sea)	15	16	17	
Mid shore	45	47	49	
High shore (furthest away from sea)	2	1	8	

(i) The students think one of the results is an outlier.

Circle the outlier in the table above.

[1]

(ii) Calculate the mean number of limpets found on the mid shore.

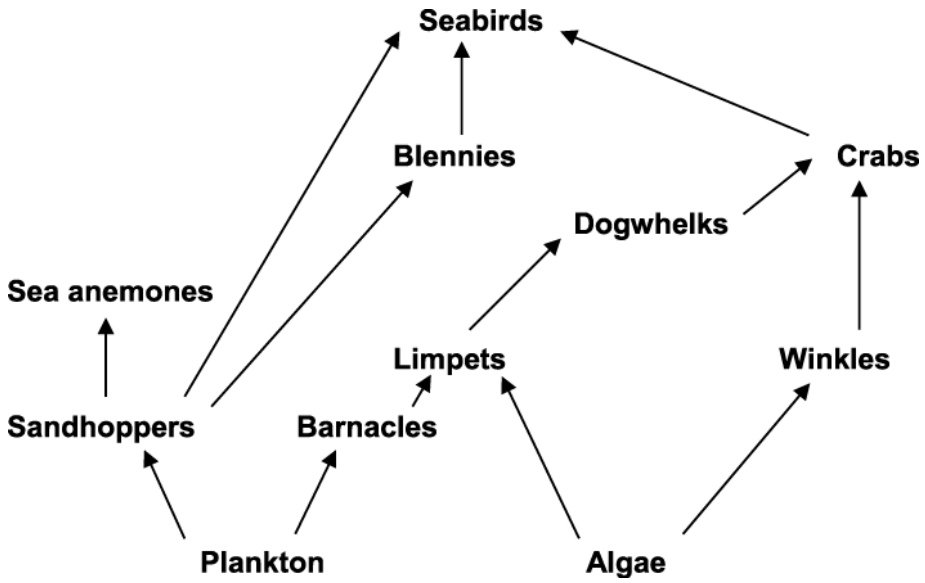
Show your working.

Number =

[2]

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(c). This is a food web for the species that can live on a rocky shore.



Explain the impact of an increase in the number of **dogwhelks** on one species in this food web.

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[2]

(d). In some areas of the UK, dogwhelk numbers are decreasing. This reduces biodiversity.

Give **two** benefits of maintaining biodiversity.

1 ---

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2 ---

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[2]

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(e). Sea anemones can reproduce asexually.

Give **one** advantage and **one** disadvantage of this method of reproduction.

Advantage _____

_____

Disadvantage _____

_____

[2]

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(f).

(i) Sea anemones are mainly found in rock pools.

During the summer the water temperature in a rock pool can increase to a level which can be dangerous for a sea anemone.

Put a tick (✓) in the box that best explains why a temperature increase is a problem.

Enzyme catalysed reactions will speed up. ☐

Enzyme catalysed reactions will slow down. ☐

Enzymes will be killed. ☐

Enzymes will become denatured. ☐

[1]

(ii) When it rains, the concentration of the sea water in a rock pool decreases.

What effect will this change in concentration have on a sea anemone's cells?

Put a tick (✓) in the box next to the correct answer.

Some cells may burst. ☐

Some cells may shrink. ☐

There will be no change to the cells. ☐

Some cells will burst, others will shrink. ☐

[1]

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2. The Neanderthal species is now extinct.

Explain what could have caused the Neanderthals to become extinct.



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

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[6]

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3(a). A supermarket is considering how they can make their shopping bags more sustainable.

What is meant by sustainability?

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[2]

(b). What factors need to be considered when making shopping bags in a sustainable way?

Put ticks (✓) in the boxes next to the **three** best answers.

The size and shape of the bag.	☐
The cost of making the bag.	☐
The materials used to make the bag.	☐
The colour of the bag.	☐
The energy used to make the bag.	☐
The pollution created when the bag is made.	☐

[2]

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(c). Biodegradable bags are more sustainable than standard plastic bags.

It is still better to reduce the use of biodegradable bags.

Which statement best explains why?

Put a tick (✓) in the box next to the best answer.

Biodegradable bags need energy to be transported to the shops. ☐

Biodegradable bags don't look as good as standard plastic bags. ☐

Biodegradable bags need oxygen to break down. ☐

Biodegradable bags are not expensive to make. ☐

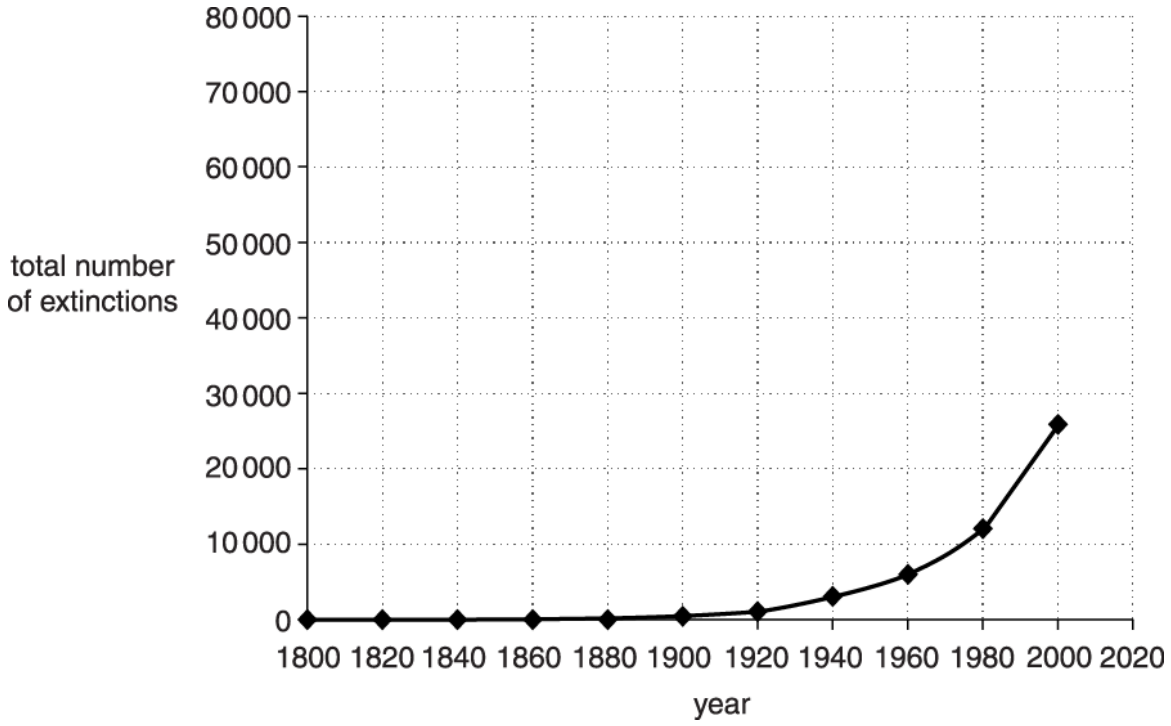
[1]

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4(a). Species that no longer exist are said to be extinct.

The graph shows the estimated total number of extinctions worldwide since 1800.



(i) The graph suggests that very few, if any, species became extinct between 1800 and 1900.

Which of the statements are the most likely reasons for this?

Put ticks (✓) in the boxes next to the **two** most likely answers.

Between 1800 and 1900 …

… there were fewer species so there were fewer to become extinct. ☐

… human activity was less damaging to plants and animals. ☐

… humans were eating all the plants and animals. ☐

… life on Earth began.

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… there is not much evidence written down about the plants and animals.

[2]

(ii) Continue the line on the graph to predict how many species are likely to have become extinct by 2020.

number of extinct species by 2020 = _____ [1]

(iii) Describe the trend shown on the graph after 1900 and give a possible explanation for this.

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[1]

(b). Scientists work hard to prevent species becoming extinct.

(i) Suggest **one** way in which scientists can help to prevent species becoming extinct.

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[1]

(ii) Suggest why preventing extinctions is an important part of using the environment in a sustainable way.

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[2]

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5(a). People with haemophilia lack the gene to make the protein Factor 8 (Factor VIII).
As a result their blood cannot clot if they cut themselves.

Suggest how the process of genetic modification could be carried out to treat people with haemophilia.

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

[6]

(b). One example of genetic modification is the production of golden rice.
Golden rice has a gene inserted that produces vitamin A.
White rice does not contain vitamin A.
Countries with people who eat mainly white rice have high levels of blindness due to a lack of vitamin A.

Suggest why people in these countries may be more in favour of the genetic modification of organisms than people who live in the United Kingdom.

[2]

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(c). This question is about genetic modification.

There are many examples of genetic modification.
Which of the following can be achieved by genetic modification?
Put ticks (?) in the boxes next to the **two** correct answers.

sexual reproduction in plants	☐
bacterial synthesis of medicines	☐
testing for genetic disorders	☐
selective breeding	☐
asexual reproduction in animals	☐
herbicide resistance in crop plants	☐

[2]

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6(a). It is very important that the use of natural resources by humans is sustainable.

What is meant by the sustainable use of natural resources?
Put a tick (?) in the box next to the correct description.

Resources are not taken from the environment. ☐

Resources are used faster than they are replaced. ☐

Resources are only used if they are urgently needed. ☐

Resources are used at the rate at which they are replaced. ☐

Resources are looked for in new areas. ☐

[1]

(b). Suggest **two** ways that North Sea fish stocks could be managed in a sustainable way.

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[2]

(c). Tensions sometimes exist between conserving a natural ecosystem and the needs of local people.
Suggest why this tension may exist.

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[1]

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7(a). Sunita studies biodiversity in four different habitats, **A**, **B**, **C** and **D**.

She measures the number of different species and the relative size of the population of the most common species in each habitat.

These are her results.

	Habitat **A**	Habitat **B**	Habitat **C**	Habitat **D**
number of different species	20	106	10	255
relative size of populations	large	medium	small	large

(i) Which habitat, **A**, **B**, **C** or **D** shows the greatest biodiversity?

Explain your answer.

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[2]

(ii) Look at the following table of data.

Habitat	Features
part of a desert	medium number of species, but small populations
part of the Antarctic	large populations, but a small number of species
part of a tropical rain forest	large populations and a large number of species
part of a woodland	medium population size and medium number of species

Which habitat, **A**, **B**, **C** or **D**, is likely to be part of Antarctica?

---------- **[1]**

(iii) Describe **one** criteria other than number of species or population size that Sunita could use to measure biodiversity.

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[1]

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(b). Which of the following are good examples of why biodiversity should be maintained?

Put ticks (?) in the boxes next to the **three** correct answers.

The ultimate source of energy for food webs is the Sun.	☐
A new antibiotic is discovered in a rare species of plant.	☐
A gene is identified that could make crops grow in a drier climate.	☐
Classification is used to make it easier to identify different organisms.	☐
Mutations are required for the development of a new species.	☐
Evidence for evolution comes from the fossil record and from DNA.	☐
Darwin's theory of natural selection.	☐
All living organisms are dependent on other organisms for their survival.	☐

[3]

(c). Human activity can have an unintended direct impact on the environment.

Describe **one** example.

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[1]

END OF QUESTION PAPER

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