4-7 Ecology – Trilogy

1.0 **Figure 1** shows a fennec fox.

Figure 1

Drew Avery Creative Commons 2.0

Fennec foxes live in the desert.

1.1 Draw **one** line from each adaptation of the fennec fox to the advantage of the adaptation.

[3 marks]

Adaptation	Advantage
	To help it to find food in places there is a lack of food
Omnivorous	To reflect the sun's rays
Able to get water from food	To keep it warm in cold nights
Large ears	To allow it to cool down blood quickly
	To keep it hydrated

1.2 Fennec foxes mate for life.
What type of adaptation is this?

[1 mark]

Tick **one** box.

Behavioural ☐

Emotional ☐

Functional ☐

Structural ☐

1.3 Animals, such as fennec foxes, compete with each other.

Give **two** biotic factors that animals compete for.

Choose from the words in the box.

[2 marks]

Carbon dioxide	Mates	Light
Heat	Territory	Oxygen

1.4 Factors that affect communities are biotic factors and abiotic factors.

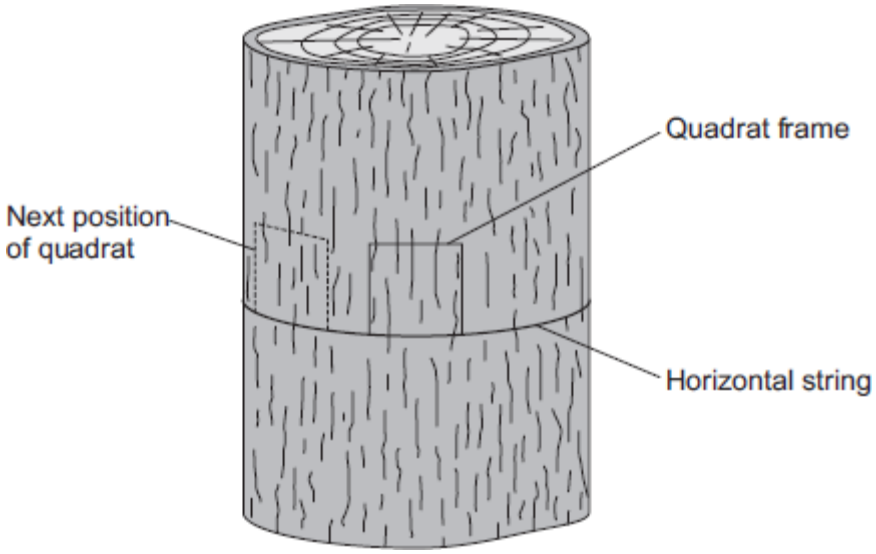
Name **two** abiotic factors that affect communities.

[2 marks]

_____

_____

2.0 Students investigated the distribution of a green alga on a tree trunk.

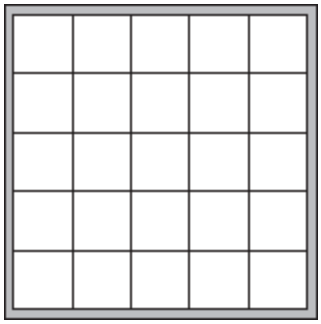


The students:

- tied a piece of string horizontally round a tree
- put a quadrat on the string so that the quadrat faced south
- estimated the percentage of the area in the quadrat covered with the green alga
- repeated the observation with the quadrat facing south west, west, north west, north, north east, east and south east.

Figure 2 shows the quadrat the students used.

Figure 2

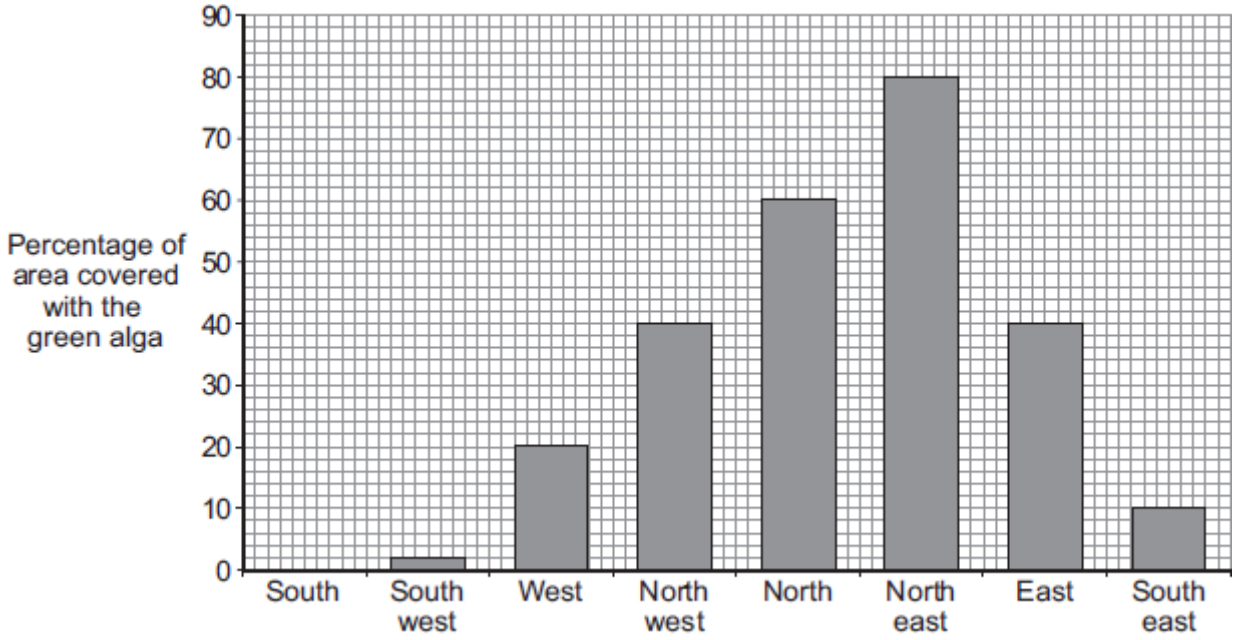


2.1 Describe how you would estimate the percentage of the area covered with the green alga in one quadrat.

[2 marks]

2.2 **Figure 3** shows the students' results.

Figure 3



Describe how the direction that the quadrat faced affected the percentage area covered with the green alga.

[2 marks]

2.3 What was the median of the percentage area covered with the green alga?

[2 marks]

Show your working.

Median = _____ %

3.0 Each year more crops are being grown. Large areas of rain forest are being cleared and burnt in many parts of the world. The cleared land is being used to grow crops. The cleared land will often produce crops for only a few years.

3.1 Explain why more crops are being grown each year.

[2 marks]

3.2 Explain why burning rain forests is not seen as a sustainable answer to increasing crop production.

Include in your answer both local and global effects.

[6 marks]

4.0 The future of the human species on Earth relies on us maintaining a good level of biodiversity.

4.1 State what is meant by the term biodiversity.

[1 mark]

_____

_____

4.2 Give **three** examples of ways in which scientists and other people have tried to maintain biodiversity in different environments.

[3 marks]

_____

_____

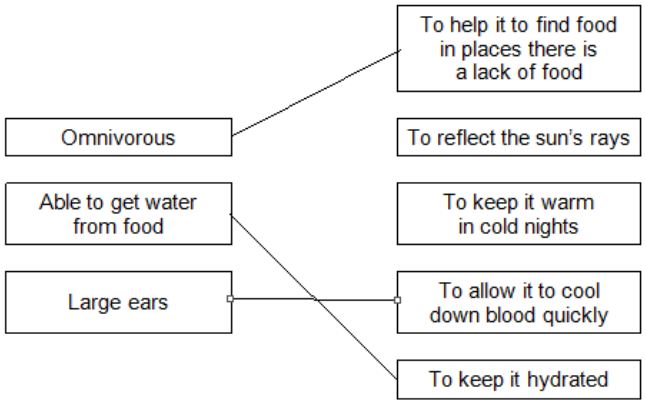
_____

_____

_____

_____

MARK SCHEME

Qu No.		Extra Information	Marks
1.1		extra lines from left cancel mark	3
1.2	Behavioural		1
1.3	Territory Mates	in either order	1 1
1.4	any **two** from: • light (intensity) • temperature • moisture levels • soil pH • soil mineral content • carbon dioxide levels (for plants) • oxygen levels (for aquatic animals)	do **not** allow biotic factors	2

Qu No.		Extra Information	Marks
2.1	estimate / count number of squares covered divide by total number of squares and multiply by 100 or multiply by four.	do **not** allow number of squares containing algae	1 1
2.2	any **two** from: • more / most in North east facing • followed by the North facing • the South facing had no green alga		2
2.3	List numbers in increasing order: 0, 2, 10, 20, 40, 40, 60, 82 Median half way between 20 & 40 Median = 30		1 1

Qu No.		Extra Information	Marks
3.1	increased human population increased standard of living		1 1
3.2			
Level 3:	Clear, coherent answer including effects on crops, local environment and the global environment both in the long and short term.		5 – 6
Level 2:	Answer includes relevant points from at least two of the three areas, but lacking in detail or scientific explanations.		3 – 4
Level 1:	Isolated points made from at least one of the three areas. Little detail.		1 – 2
Indicative content			
Local effects Effects on crops • Short term increase in production • Longer term: nutrients in the soil are absorbed by plants • Longer term: plants are destroyed so the nutrients are not replaced / recycled Effects on local environment • Decreased biodiversity • Plants and animals lose their natural habitat • Possible loss of species • Erosion of soil due to shallow roots **Global effects** Effects on global environment • increased release of carbon dioxide into atmosphere when trees are burned • reduced rate of carbon dioxide removal from atmosphere • increased carbon dioxide absorbs more of energy radiated by Earth • (leading to) global rise in temperature			

Qu No.		Extra Information	Marks
4.1	variety of all the different species of organisms on Earth / in an ecosystem		1
4.2	any **three** from: • breeding programmes for endangered species / example e.g. rhinos • protecting and regenerating rare habitats • reintroduction of field margins and hedgerows where only one crop is grown • reducing deforestation • reducing carbon dioxide emissions • recycling resources and reducing landfill	allow specific examples	3