1 Fig. 2.1 shows the root systems of two species of desert plant, **A** and **B**.

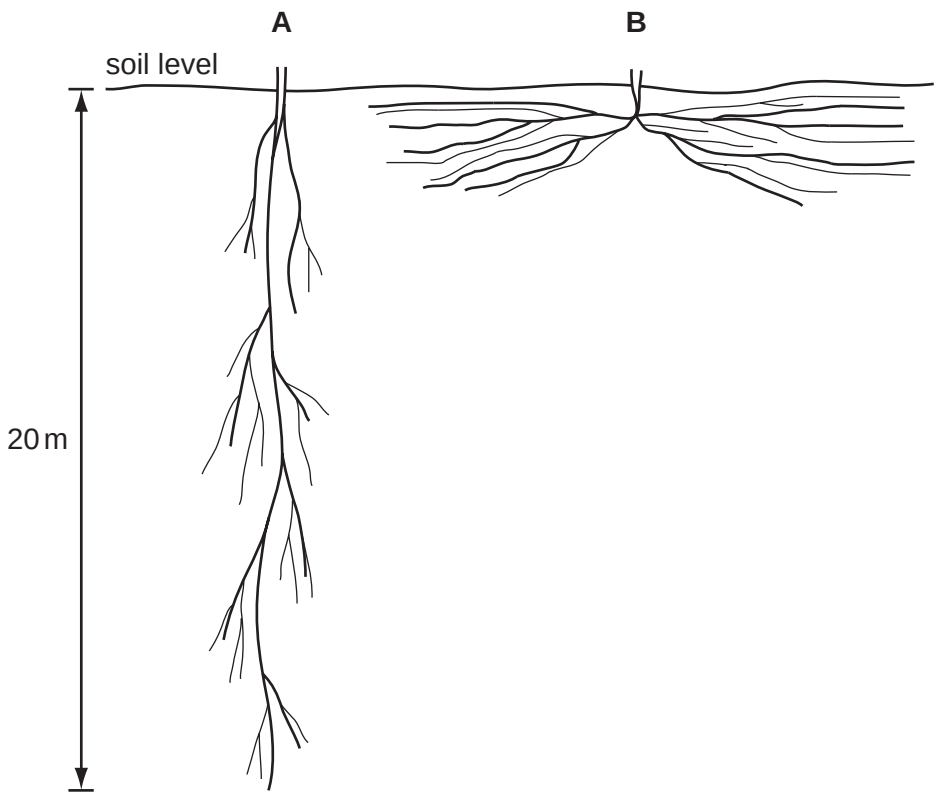


**Fig. 2.1**

**(a)** Describe the two root systems shown in Fig. 2.1 **and** explain how each is an adaptation for survival in a desert ecosystem.

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..... [4]

**(b)** Describe **and** explain two ways in which the **leaves** of desert plants reduce water loss in transpiration.

1. .....

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2. .....

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..... [4]

**(c)** Xylem and phloem are transport tissues in plants. They transport substances from organs that are known as sources to organs known as sinks.

Complete the table to show:

- **two** substances being transported in each tissue
- an organ that is a source for substances being transported in each tissue
- an organ that is a sink for substances being transported in each tissue.

| tissue | substances being transported | source of substances in the plant | sink for substances in the plant |
|---|---|---|---|
| xylem | 1 ……<br>2 …… | | |
| phloem | 1 ……<br>2 …… | | |

[6]
[Total: 14]

**2** The wild dog is one of the smaller African carnivorous mammals. It has disappeared from 25 of the 39 countries where it used to live. Wild dogs hunt in packs, feeding on antelopes, which are grass-eating mammals.

A conservation programme has been started to increase the wild dog population in South Africa. Farmers are worried about numbers getting out of control because wild dogs breed at a very fast rate. However, conservationists are not concerned because the lion is a natural predator of the dogs.

**(a)** Wild dogs are carnivorous mammals.

**(i)** Define the term *carnivore*.

.....

[1]

**(ii)** State **one** external feature which distinguishes mammals from other vertebrates.

.....

[1]

**(b)** Suggest two reasons why numbers of African wild dogs are decreasing.

1. .....

2. ..... [2]

**(ii)** Suggest what could happen to the species if numbers continue to decrease.

.....

.....

[1]

**(c)** Using the information in the passage above, construct a food chain for a wild dog, including its predator.

Label each organism with its trophic level.

**(d)** It is important that the wild dog species is conserved.

**(i)** Explain the meaning of the term *conservation.*

.....

.....

..... [2]

**(ii)** Outline the measures that could be taken to conserve a mammal, such as the wild dog.

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..... [3]

**(e)** When wild dogs die, nitrogen compounds in their bodies may become available for plants. Outline the processes that occur to make these nitrogen compounds in the bodies of dead animals available for plants to absorb.

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..... [5]

[Total: 19]

3 The freshwater mussel, *Margaritifera margaritifera*, is a mollusc which lives in rivers and streams.

When the mussel reproduces, gametes are released into the water and fertilisation takes place.

The embryos, in the form of larvae, attach themselves to the gills of fish and develop there for a few months.

The larvae then release themselves and grow in sand in the river, feeding by filtering food from the water.

The number of mussels is falling due to human predation and the species is threatened with extinction.

**(a)** The mussel belongs to the group known as the molluscs. State two features you would expect the mussel to have.

1. .....

2. ..... [2]

**(b)** Explain how the species name of the freshwater mussel can be distinguished from its genus.

.....

..... [1]

**(c)** State the type of reproduction shown by the mussel.

Explain your answer.

type of reproduction .....

explanation .....

..... [2]

**(d)** **(i)** Fish gills have the same function as lungs. Suggest **one** advantage to a mussel larva of attaching itself to fish gills.

.....

..... [1]

**(ii)** The mussel develops on the fish gills. Define the term *development*.

.....

..... [1]

**(e)** The mussel is threatened with extinction. Name another organism which is also threatened with extinction and outline how it could be conserved.

name of species .....

outline of conservation .....

.....

..... [3]

[Total: 10]