

1

Fig. 7.1 shows a food web.

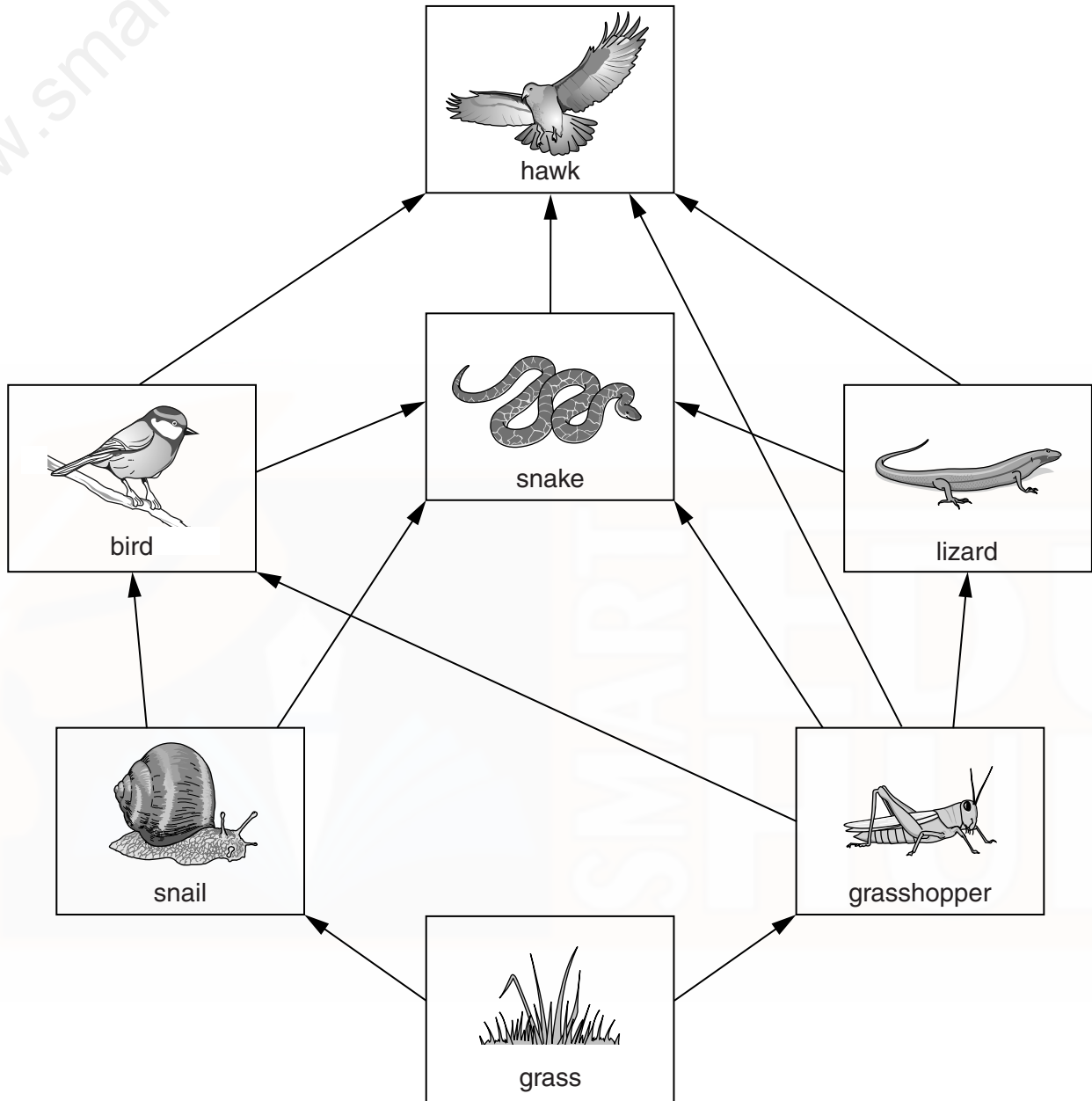


Fig. 7.1

(a) State what the arrows on Fig. 7.1 represent.

.....

..... [1]

(b) Use the information in Fig. 7.1 to give:

the name of a producer,

the name of a secondary consumer,

the number of herbivore species present,

the number of carnivore species present.

[4]

MARK SCHEME:

| | | | |
|-----|---|-----|--|
| (a) | direction of energy transfer/flow/movement (through the food web) ; | [1] | |
| (b) | <u>grass</u> ; bird/snake/lizard ; 2 ; 4 ; | [4] | |

2 Fig. 7.1 shows some of the feeding relationships in an oak woodland.

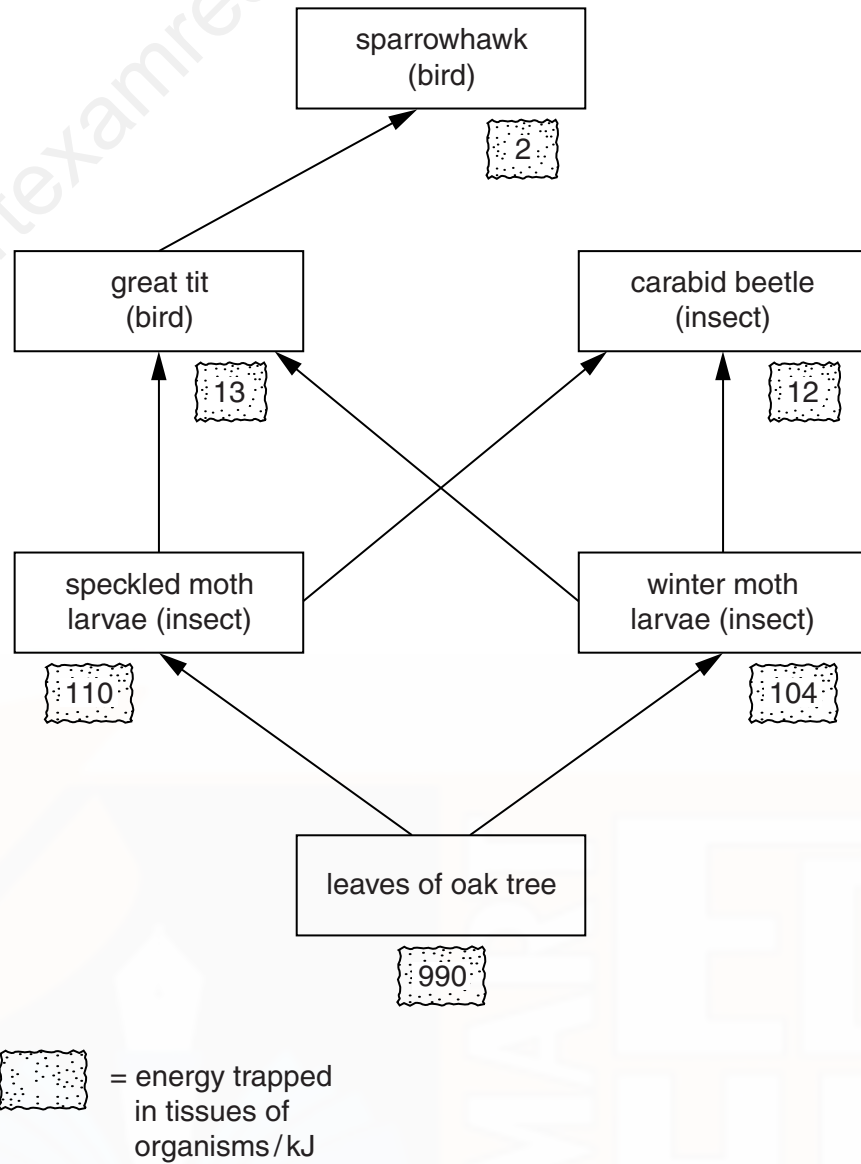


Fig. 7.1

(a) Use the information in Fig. 7.1 to name:

a producer

an organism that feeds on consumers.

[2]

(b) (i) Name the two secondary consumers in this food web.

..... and

[1]

- (d) Some sparrowhawks have not been able to produce young because their eggs have only very thin shells. The tissues of these female sparrowhawks were found to contain high concentrations of insecticide.

Sparrowhawks do not eat insects.

Suggest how high concentrations of insecticide could have built up in the bodies of the sparrowhawks. Refer to Fig. 7.1 in your answer.

.....

.....

..... [3]

| | | | |
|------------|---|---------|--|
| (a) | oak tree /leaves of oak tree; carabid beetle /great tit/ sparrow hawk; | [2] | |
| (b) | carabid beetle and great tit; | [1] | |
| (c) | insecticide is persistent /not broken down; larvae contain insecticide; great tits consume many larvae; (idea of) insecticide passes up chain; hawks consume many great tits; so insecticide becomes concentrated; | max [3] | |

- 3** (ii) Scientists suggest that it would be better for the environment if the straw was dug or ploughed back into the soil.
In the soil, the straw could decay and decompose.

Name **one** of the main groups of organisms that is responsible for decay and decomposition.

..... [1]

- (iii) State **two** of the main benefits to plants of decomposition.

1

.....

2

.....

[2]

MARK SCHEME:

| | | | |
|------|--|---------|--|
| (i) | fungi / bacteria / saprophyte / saprotroph; | max [1] | |
| (ii) | supplies minerals / mineral ions / fertilisers / nitrates / phosphates to soil; releases carbon dioxide to the atmosphere; heats the soil; | max [2] | |

4 Fig. 4.1 shows the organisms in a woodland food chain.

The numbers written below each organism show the relative amount of energy at each trophic level in the food chain.

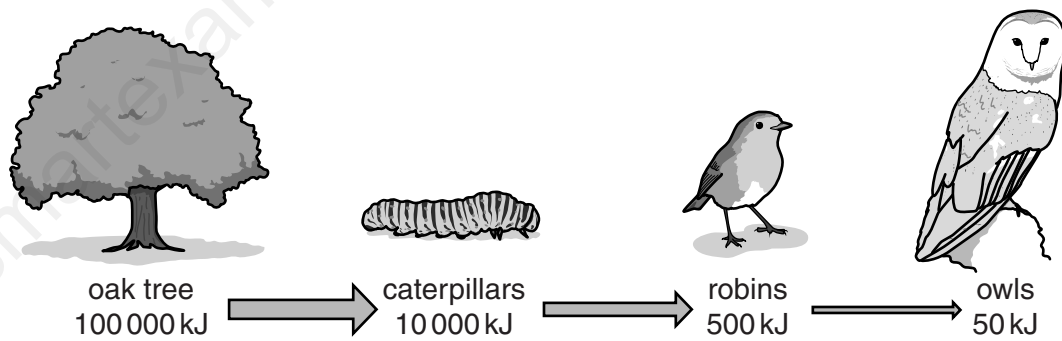


Fig. 4.1

(a) (i) State what the arrows in Fig. 4.1 represent.

.....[1]

(ii) Suggest why the arrows are different sizes.

.....
[1]

(b) State the amount of energy that passes from the producers to the first consumers in Fig. 4.1.

..... kJ [1]

(c) Name **two** carnivores shown in Fig. 4.1.

..... and [1]

(d) Only 10% of the energy in the robins passes to the owls.

Describe what happens to the other 90% of the robins' energy.

.....

 [2]

[Total: 6]

MARK SCHEME:

| | | | |
|---------|---|-------------------|-----------------------------|
| (a) (i) | direction of energy transfer/flow/movement (through the food web); | [1] | |
| (ii) | they represent different amounts of energy AW; | [1] | |
| (b) | 10 000 kJ; | [1] | |
| (c) | robin + owl; | [1] | must have both either order |
| (d) | lost to the surroundings as heat; used during metabolism e.g. respiration (of food)/movement/ keeping warm; not all eaten; | max [2] | |
| | | [Total: 6] | |

5

(a) Fig. 7.1 shows the relationships between some organisms in part of an ecosystem.

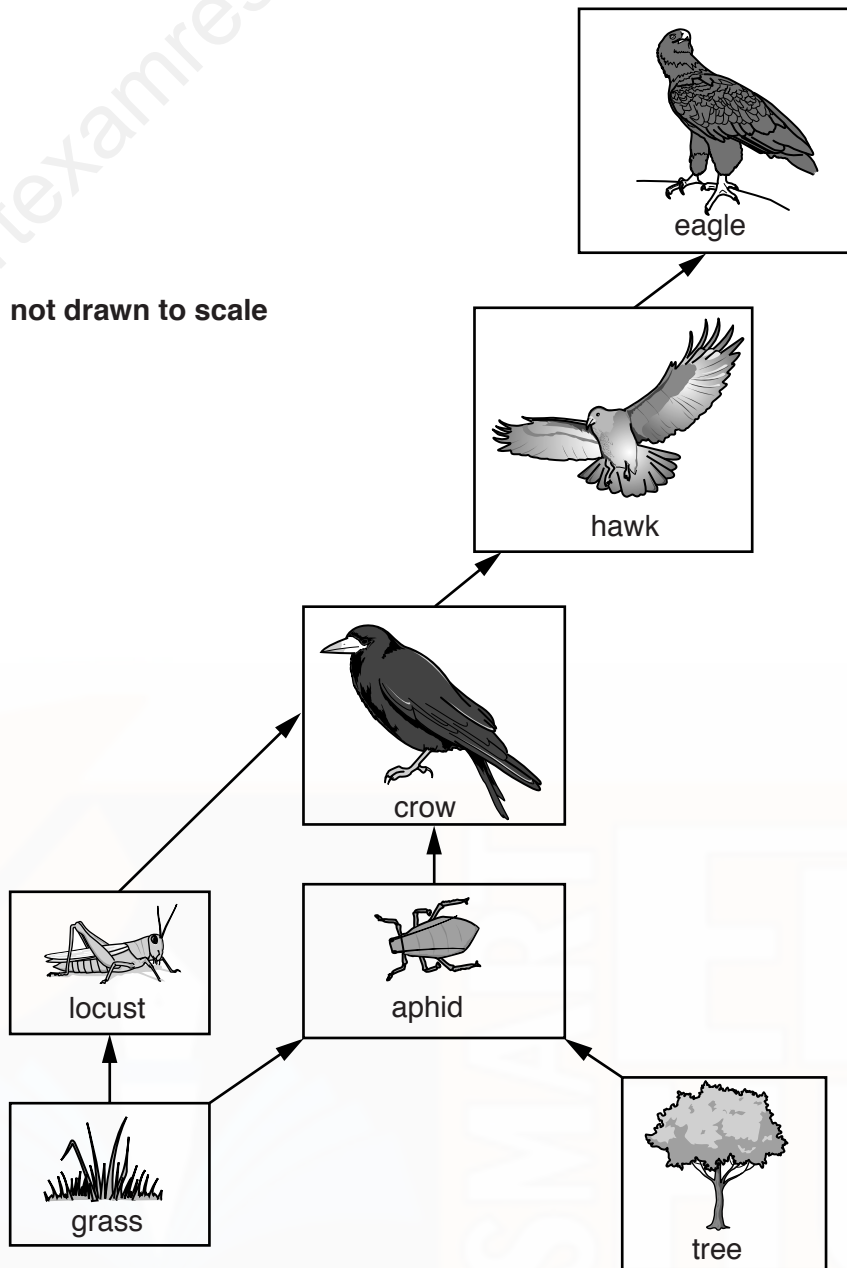


Fig. 7.1

(i) Finches are another organism in this ecosystem. These birds eat the seeds that the tree produces, and the hawks and eagles eat the finches.

Add this information to Fig. 7.1.

[3]

(ii) Suggest and explain **two** changes that might occur if the eagles in this ecosystem died out.

change

.....

explanation

.....

change

explanation

[4]

(b) The boxes on the left contain the names of types of organisms found in a food web.

The boxes on the right contain definitions of these types of organisms.

Draw a line from each box on the left to the box on the right that states its definition.

One example has been done for you.

| | |
|------------|--|
| carnivore | an animal that gets its energy by eating other animals |
| consumer | the position of an organism in a food chain, food web or pyramid of numbers, biomass or energy |
| decomposer | an animal that gets its energy from eating plants |
| herbivore | an organism that gets its energy from feeding on other organisms |
| producer | an organism that gets its energy from dead or waste organic matter |
| | an organism that makes its own organic nutrients, usually using energy from sunlight, through photosynthesis |

[4]

[Total: 11]

MARK SCHEME:

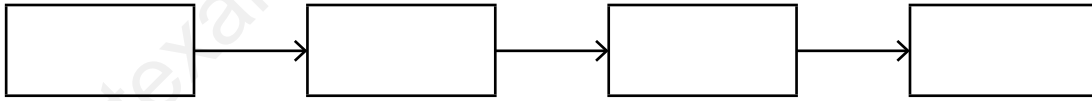
| | | | |
|------------------------|--|----------------|--|
| <p>(a) (i)</p> | <p>finch (in a box) above level of tree and grass ;</p> <p><u>arrowed</u> line from tree to finch ; R if no arrow head / arrow head in wrong direction / extra incoming line</p> <p>two <u>arrowed</u> lines from finch to hawk and eagle ; R if no arrow heads / arrow heads in wrong direction / extra outgoing line</p> | <p>[3]</p> | |
| <p>(a) (ii)</p> | <p>increase in hawks ; as not eaten (by eagles / no predators / AW) ;</p> <p>increase in hawks ; decrease in, everything eaten by the hawk / decrease in finch / crow ;</p> <p>decrease in crows / finches ; as more hawks to eat them ;</p> <p>increase in finches ; as fewer eagles to eat them ;</p> <p>increase in aphids and locusts ; as fewer crows to eat them ;</p> <p>any logical suggestion ; with reason ;</p> | <p>max [4]</p> | |

| | | |
|-------------------|--|---|
| <p>(b)</p> | | <p>award 1 mark for each correct line</p> <p>R any box on the left with more than 1 line coming from it</p> <p>[4]</p> <p>[Total: 11]</p> |
|-------------------|--|---|

6 Some students observed a number of organisms in a habitat.

They saw that beetles eat plants, snakes eat frogs and frogs eat beetles.

(a) Write out a food chain linking these organisms. Write your answers in the boxes.



[1]

MARK SCHEME:

| | | | |
|-----|---------------------------|-----|--|
| (a) | plant beetle frog snake ; | [1] | |
|-----|---------------------------|-----|--|

7 The list of words and phrases is about the relationships of organisms with one another and with their environment.

carnivore decomposer ecosystem food chain
food web herbivore population producer pyramid of numbers
pyramid of biomass trophic level

Table 7.1 shows a list of definitions of some of these words and phrases.

Match each definition with one word or phrase from the list. Write your answers in Table 7.1.

Each word may be used once, more than once or not at all.

Table 7.1

| definition | matching word or phrase |
|---|-------------------------|
| an animal that gets its energy by eating other animals | |
| a network of interconnected food chains | |
| an organism that makes its own organic nutrients by photosynthesis | |
| the position of an organism in a food chain | |
| an animal that gets its energy by eating plants | |
| a group of organisms of one species, living in the same area at the same time | |
| a unit containing all of the organisms and their environment, interacting together, in a given area | |
| a diagram which shows the quantities of organisms involved in a set of feeding relationships | |

[8]

[Total: 8]

MARK SCHEME:

| definition | matching word or phrase | | |
|---------------------|-----------------------------|-----|--|
| an animal... | <u>carnivore</u> ; | | |
| a network.. | <u>food web</u> ; | | |
| an organism.. | <u>producer</u> ; | | |
| the position... | <u>trophic level</u> ; | | |
| an animal... | <u>herbivore</u> ; | | |
| a group of ... | <u>population</u> ; | | |
| a unit of ... | <u>ecosystem</u> ; | | |
| a diagram which ... | <u>pyramid of numbers</u> ; | | |
| | | [8] | |

8 (a) Fig. 7.1 shows four organisms in a food chain, the part each organism plays in the food chain and a description of how it feeds. These are **not** in the correct order.

Draw **one** straight line from each organism to the part it plays in the food chain.

Draw **one** straight line from each part played in the food chain to its description.





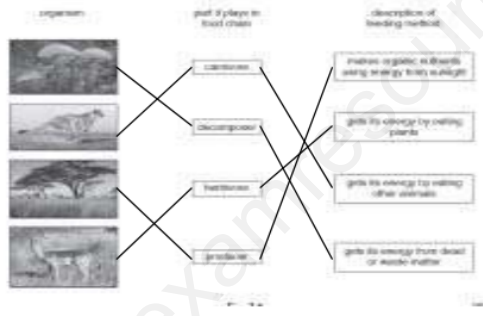
| organism | part it plays in food chain | description of feeding method |
|---|-----------------------------|--|
|  | carnivore | makes organic nutrients using energy from sunlight |
|  | decomposer | gets its energy by eating plants |
|  | herbivore | gets its energy by eating other animals |
|  | producer | gets its energy from dead or waste matter |

Fig. 7.1

[6]

MARK SCHEME:

(a)



[max 6]

lines between organism and part played:

- 4 correct = 3
- 2 or 3 correct = 2
- 1 correct = 1

lines between part played and description:

- 4 correct = 3
- 2 or 3 correct = 2
- 1 correct = 1

Fig. 3.1 shows a food web from the African grasslands.

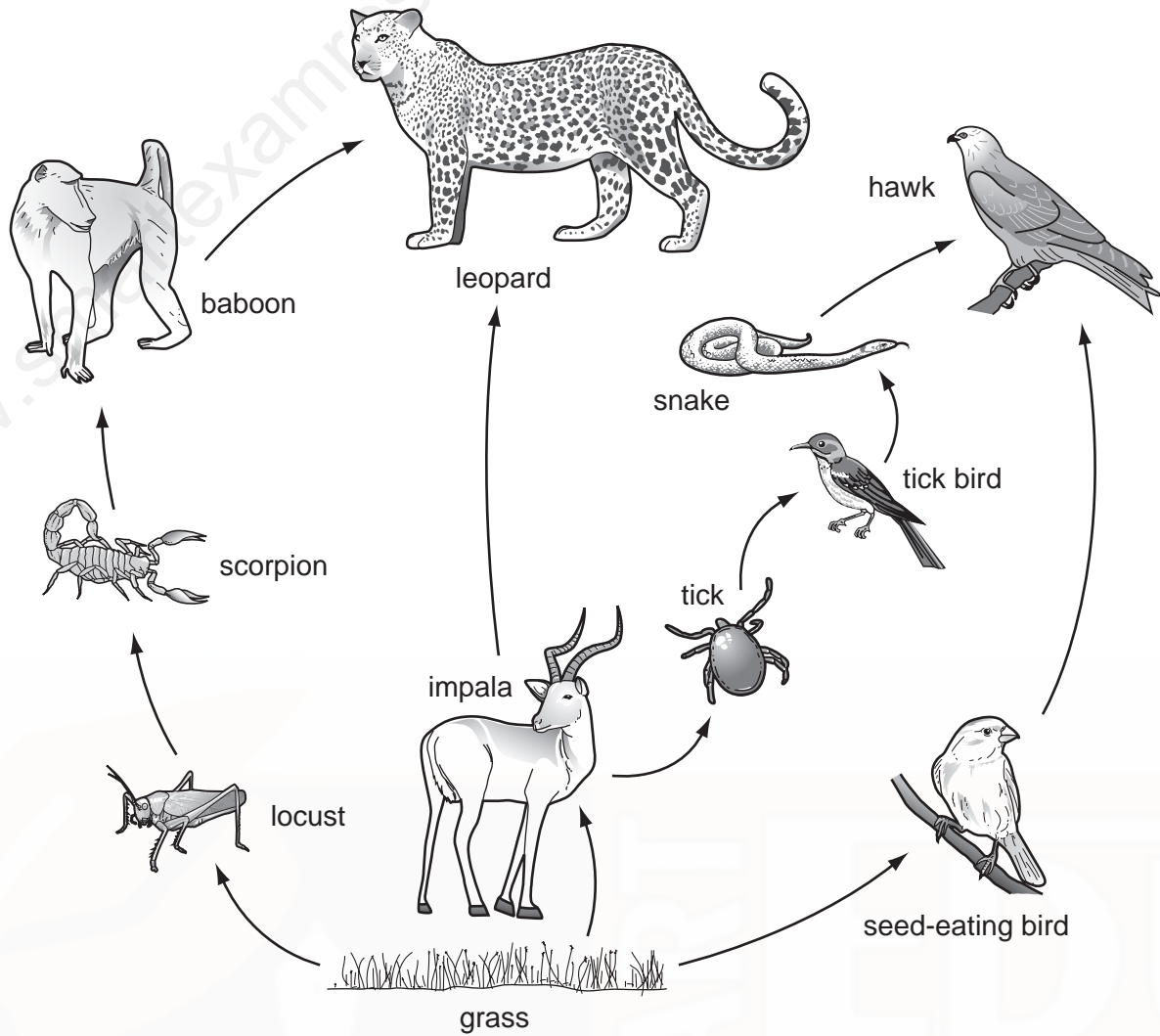


Fig. 3.1

- (a) (i) Name an organism from this food web that is a
 primary consumer [1]
 tertiary (third level) consumer [1]
 producer [1]
- (ii) Using information only from Fig. 3.1, complete the food chain.
 → → → → leopard [1]

(c) In some years a plague of locusts occurs.

Predict and explain what could happen to the population of baboons when this occurs.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

MARK SCHEME:

- (a) (i) (primary consumer) locust / impala / seed eating bird; [1]
(tertiary consumer) baboon / tick bird; [1]
(producer) grass; [1]
- (ii) grass = locust = scorpion = baboon =; [1]
(must relate to food chain of six organisms because there are 6 levels)

- (c) 1. lots of locusts **as food** for scorpions / many locusts and food;
2. more scorpions survive / scorpion population increases;
3. more **food** for baboons;
4. baboon numbers increase; (points 1-4 ORA)

10 Fig. 5.1 shows a food web.

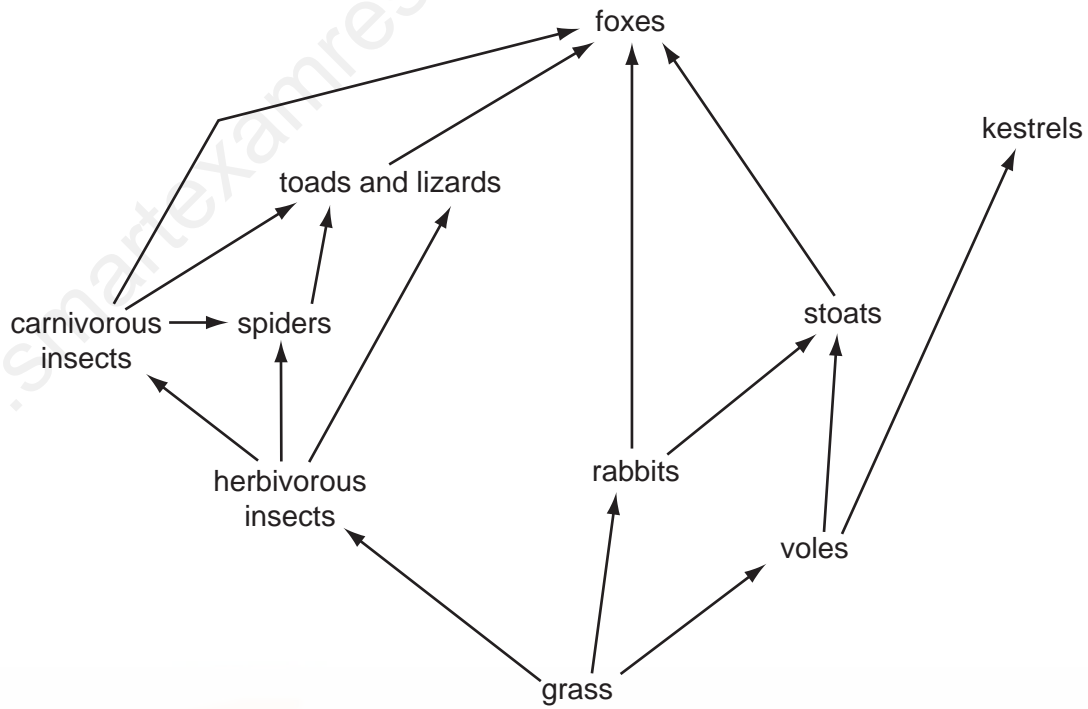


Fig. 5.1

(a) (i) Complete the food chain from this food web.



[1]

(ii) Complete each column of Table 5.1 by naming **two** appropriate organisms from the food web. Some organisms could occur in more than one column.

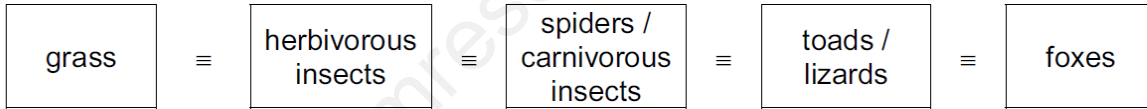
Table 5.1

| consumer | carnivore | herbivore |
|----------|-----------|-----------|
| | | |
| | | |

[3]

MARK SCHEME:

(a) (i)



[1]

(ii) consumer

Any two animals in web;

carnivore

Any two from – carnivorous insect, spider, fox, toad, lizard, stoat, kestrel;

herbivore

Any two – from herbivorous insect, vole, rabbit;

Each correct column – 1 mark [3]