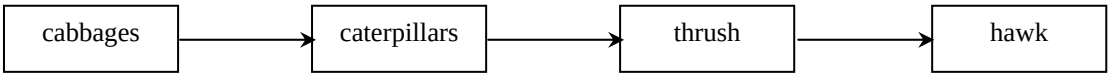
Low Demand Questions QUESTIONSHEET 1

The diagram shows a simple food chain.



(a) The cabbage plants are described as the producer in the food chain. What does this mean?

.....

..... [2]

(b) Name **one** animal from the food chain which is:

(i) a predator.

..... [1]

(ii) a prey animal.

..... [1]

(c) What does the arrow between the cabbages and the caterpillars represent?

..... [1]

(d) When the organisms in the food chain die they will decay.

(i) Name **two** types of organisms which bring about decay.

.....

..... [2]

(ii) Gardeners make use of this process of decay in a compost heap. Name two conditions, in a compost heap, which help to speed up the process of decay.

Choose your answers from the list.

dry light warmth lack of carbon dioxide cold dark damp

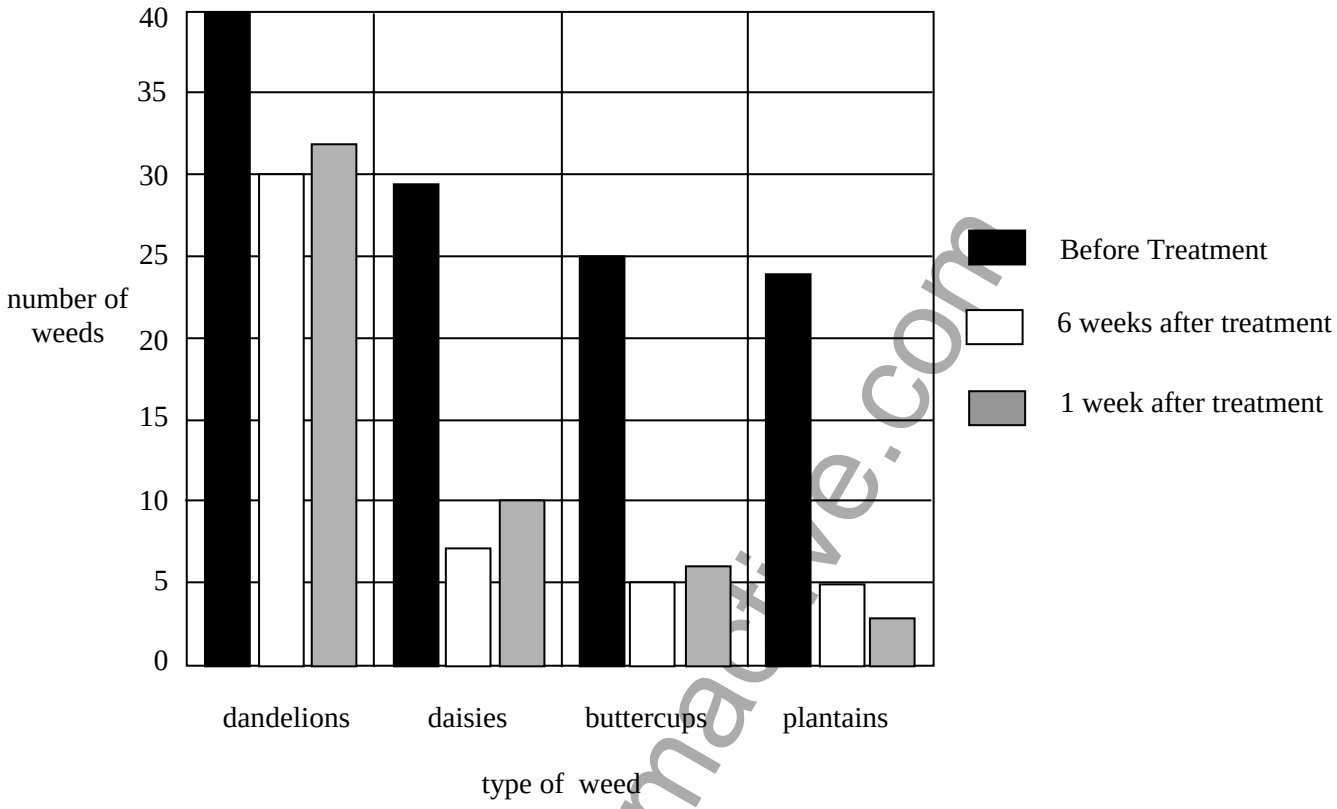
.....

..... [2]

TOTAL / 9

Low Demand Questions QUESTIONSHEET 2

An area of ground was treated with a weedkiller. The bar chart shows the number of different weeds before and after treatment.



(a) Which type of weed was affected most by the weedkiller after one week?

..... [1]

(b) Calculate the percentage decrease in the number of dandelions 1 week after treatment.
(Show your working)

Answer ..... [2]

(c) Suggest two reasons why the number of daisies shows an increase 6 weeks after treatment.

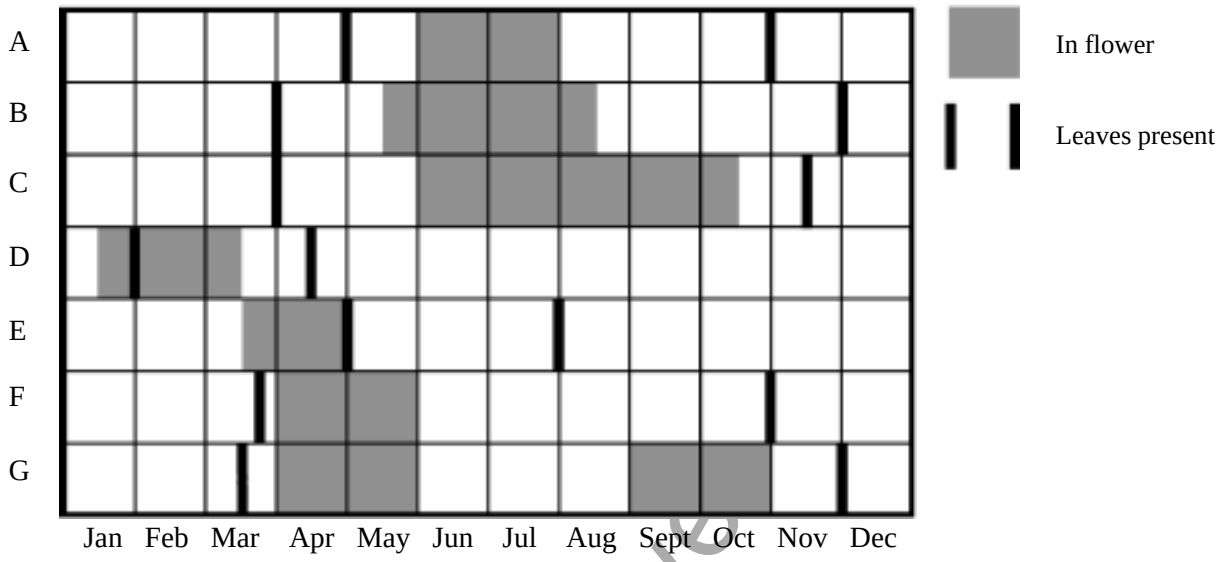
1 .....

2 ..... [2]

TOTAL / 5

Low Demand Questions QUESTIONSHEET 3

The chart shows the flowering times of several species of plants and when leaves are present.



(a) Which plant flowers earliest in the year?

..... [1]

(b) Which plant has two flowering seasons?

..... [1]

(c) Which plant flowers for the longest time?

..... [1]

(d) Which plants produces flowers before leaves?

..... [1]

(e) Which plant is in leaf for the longest time?

.....[1]

(f) Species D grows in woodland. Explain why it produces leaves in February.

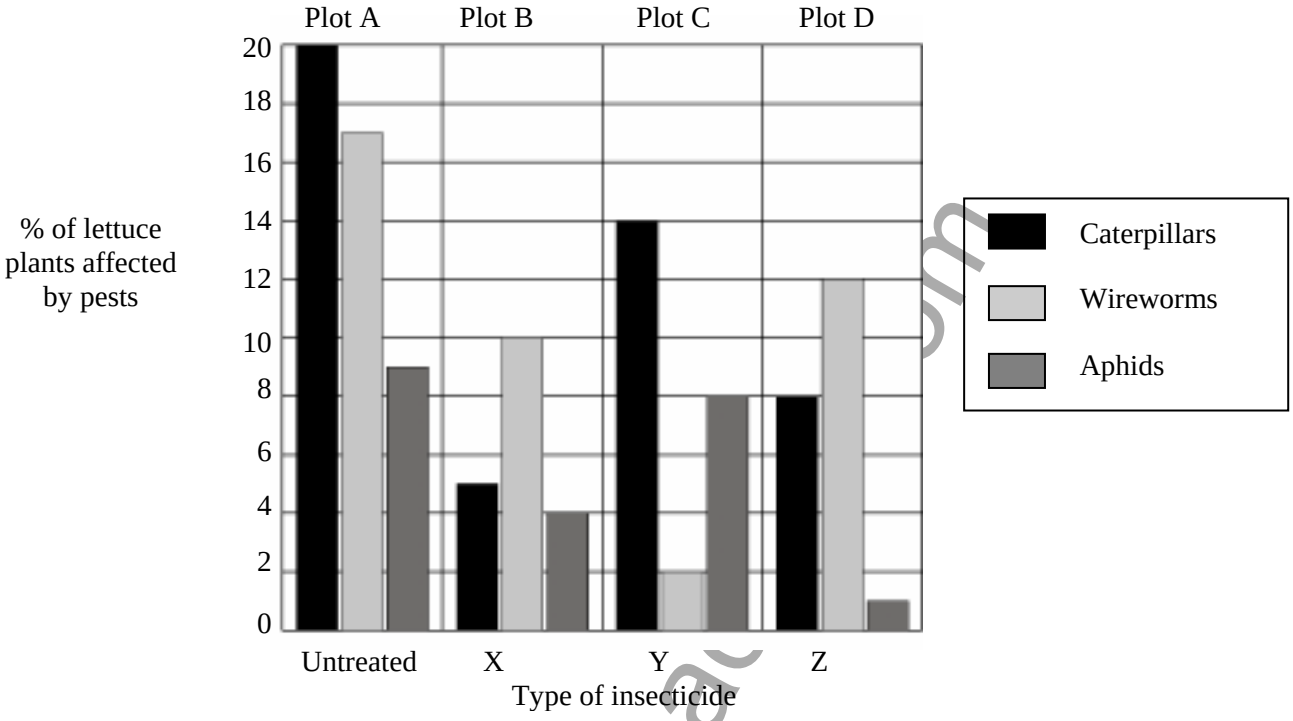
.....

..... [2]

TOTAL / 7

Low Demand Questions QUESTIONSHEET 4

A farmer tested 3 insecticides on insect pests growing on lettuce plants. A field of lettuces was divided into four plots, A, B, C and D. Plot A was left untreated while the others were sprayed with a different insecticide.



(a) Which insecticide is most effective against caterpillars?

..... [1]

(b) Which insecticide is most effective against wireworms?

..... [1]

(c) Which insecticide is least effective against aphids?

..... [1]

(d) (i) In which plot would you expect the greatest yield of lettuce?

..... [1]

(ii) Give a reason for your answer.

..... [1]

(e) Suggest two factors, other than effectiveness against pests, a farmer might take into account when deciding which insecticide to use.

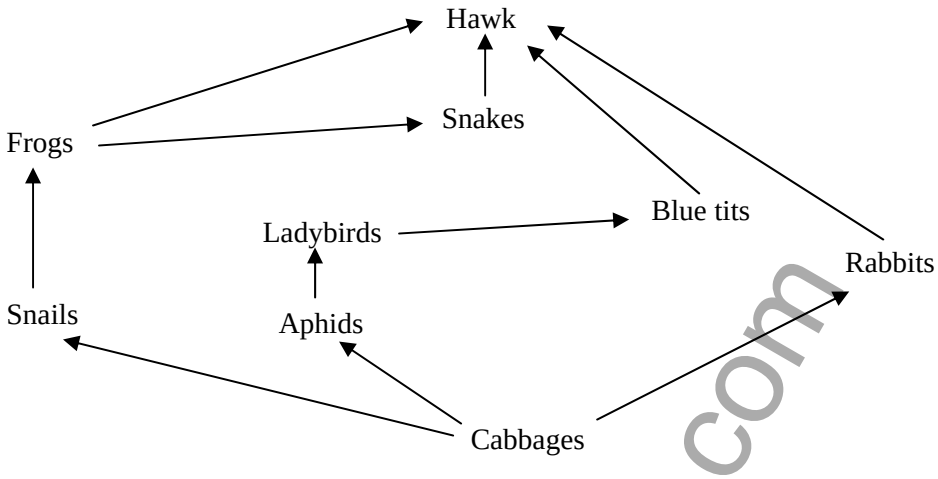
.....

..... [2]

TOTAL / 7

Medium Demand Questions QUESTIONSHEET 5

The diagram shows a food web



(a) What is the source of energy for this food web?

..... [1]

(b) From the food web name,

(i) the producer.

..... [1]

(ii) a primary consumer.

..... [1]

(iii) a secondary consumer.

..... [1]

(c) From the food web draw a food chain containing 5 organisms.

..... [1]

(d) A farmer sprays his cabbages with insecticide to kill the aphids. How will this affect the population of blue tits? Explain your answer.

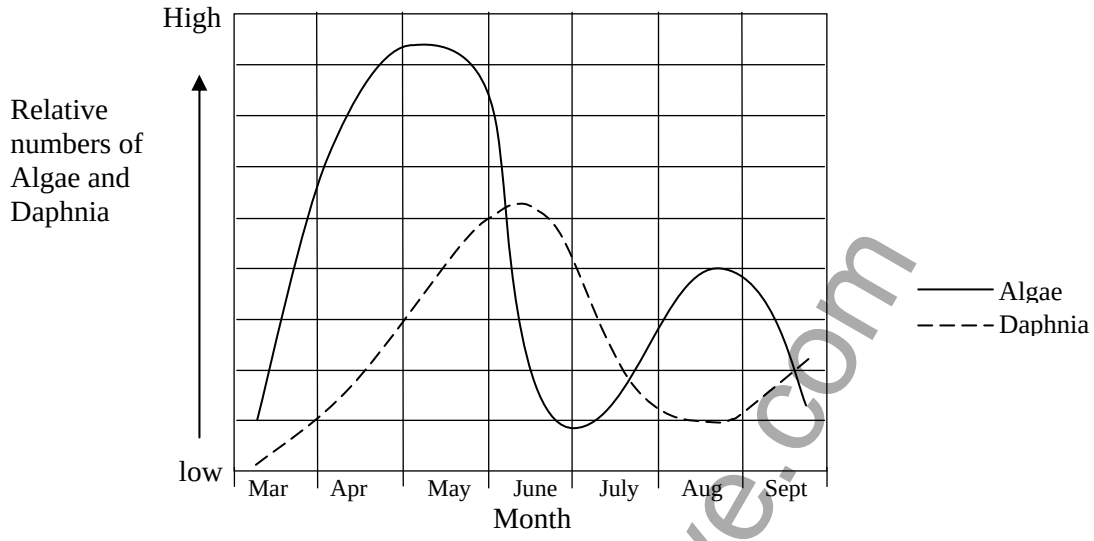
.....

..... [2]

TOTAL / 7

Medium Demand Questions QUESTIONSHEET 6

Daphnia (water fleas) are small Crustaceans which feed on algae. The graph shows the relative numbers of algae and Daphnia in a pond.



(a) (i) In which month are the numbers of algae at a maximum?

..... [1]

(ii) Give three reasons why the algae reach a peak in this month.

1.....

2.....

3..... [3]

(b) Describe the pattern shown by the number of algae from March to June.

.....

.....

..... [3]

(c) Explain why the numbers of Daphnia increase rapidly from March to early June.

.....

.....

..... [3]

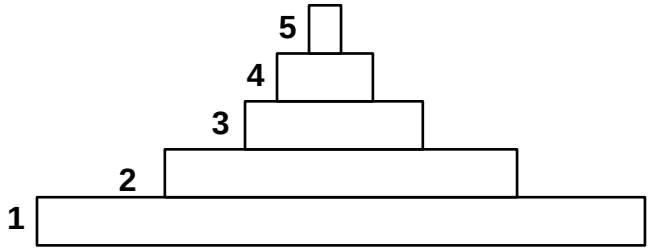
(d) Why do the numbers of Daphnia decrease rapidly in late June and July?

..... [1]

TOTAL / 11

Medium Demand Questions QUESTIONSHEET 7

The diagram shows a pyramid of biomass for a food chain with 5 levels.



(a) Which number represents the producer?

..... [1]

(b) Which number represents the prey of animal 5?

..... [1]

(c) Suggest two reasons for the drop in biomass of organisms in passing from level 1 to level 5?

1. .....

2. ..... [2]

(d) If the number of organisms numbered 2 decreased, explain what would happen to the population of organisms,

(i) at level 1?

.....

..... [2]

(ii) at level 3?

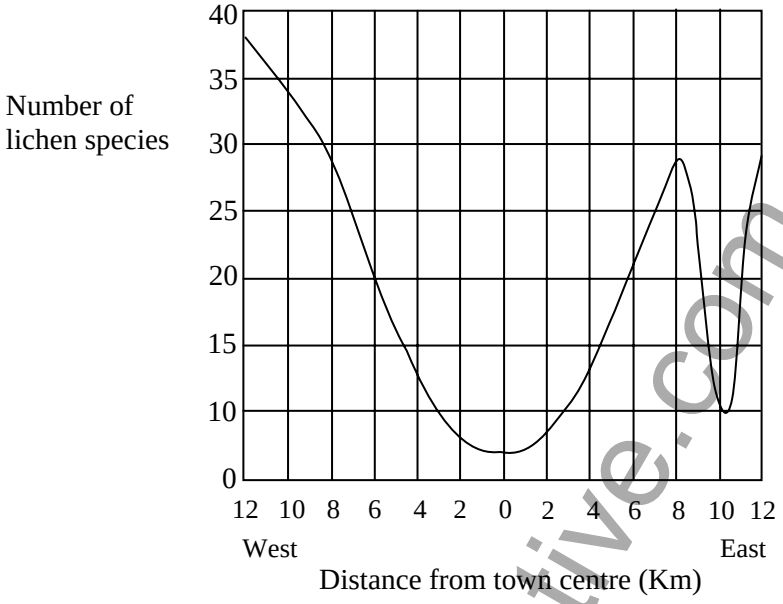
.....

..... [2]

TOTAL / 8

Medium Demand Questions QUESTIONSHEET 8

Lichens are plants which grow on tree bark, walls and roofs. They are particularly sensitive to air pollution and many types will only grow where there is clean air. The graph shows the number of different species of lichen east and west of a town.



(a) State the number of species of lichen,

(i) 6 km west of the town centre.

..... [1]

(ii) 10 km west of the town centre.

..... [1]

(b) Suggest a reason for the small number of lichen species 10 km east of the town centre.

.....

..... [2]

(c) Where is the air pollution likely to be lowest?

..... [1]

(d) Suggest a reason why the least number of species of lichen are found in the town centre.

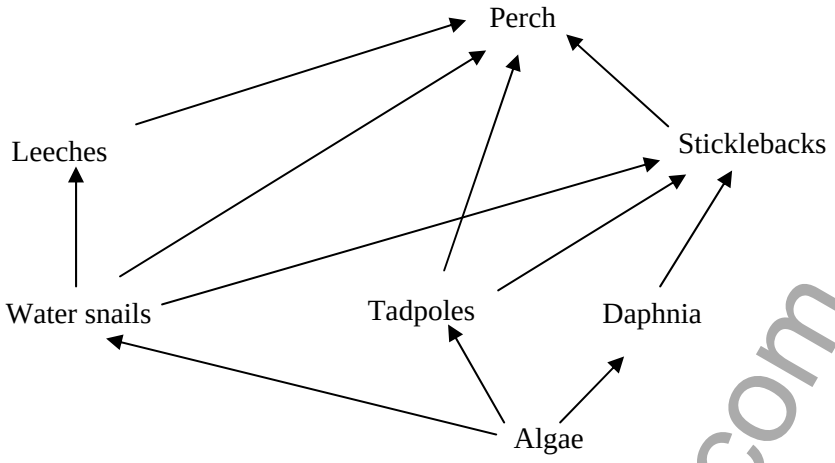
.....

..... [2]

TOTAL / 7

Medium Demand Questions QUESTIONSHEET 9

The diagram shows a food web in a pond.



(a) Name two animals which are the prey of the sticklebacks.

..... [2]

(b) How many food chains involve the sticklebacks?

..... [1]

(c) How many animals does the perch feed on?

..... [1]

(d) Large numbers of parasites live on each perch. Draw and label a pyramid of numbers for the food chain.

Algae → Tadpoles → Perch → Parasites

[2]

TOTAL / 6

Medium Demand Questions QUESTIONSHEET 10

Read the following passage which describes some of the feeding relationships in a pond.

> **Microscopic plants are eaten by tadpoles, water fleas and mosquito larvae.**
> **Insects such as water beetles and water boatmen feed on the tadpoles.**
> **Small fish prey on the water fleas and mosquito larvae.**
> **Large fish feed on the small fish, water beetles, water boatmen and tadpoles.**

(a) Construct a food web using the information in the passage.

[5]

(b) (i) What is likely to happen to the population of water beetles if all the tadpoles die.

..... [1]

(ii) Explain why.

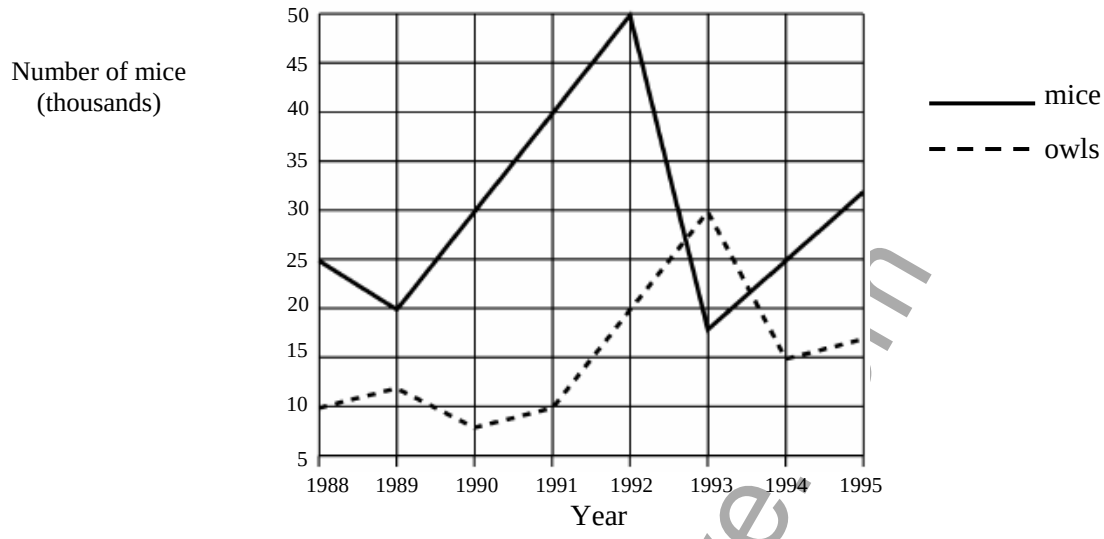
.....

..... [2]

TOTAL / 8

Medium Demand Questions QUESTIONSHEET 11

The graph shows the number of owls and mice in an area of woodland over an eight year period.



(a) Which animal is the predator?

.....[1]

(b) (i) Describe the change in the population of mice from 1988 to 1992.

.....

.....[3]

(ii) Suggest two reasons for the fall in mice numbers during 1992.

1.....[1]

2.....[1]

(c) Why does the owl population fall between 1993 and 1994?

.....[1]

(d) (i) What would happen to the population of mice if a large number of the owls die out?

.....[1]

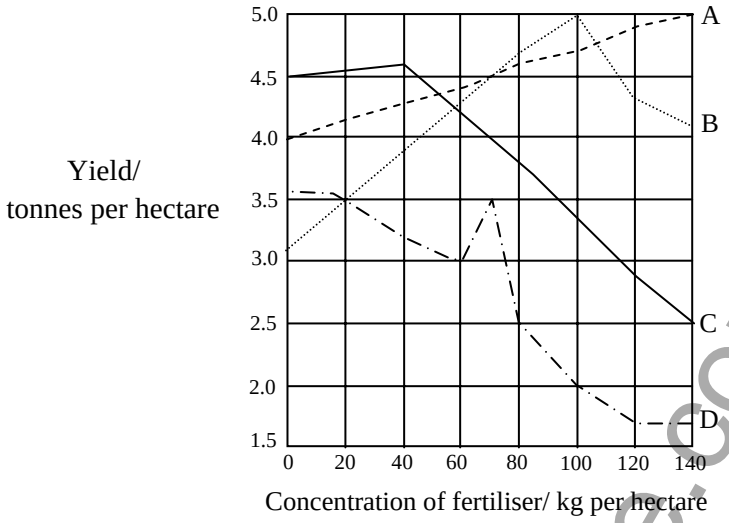
(ii) Explain why this change would take place.

.....[1]

TOTAL / 9

Medium Demand Questions QUESTIONSHEET 12

The graph shows the effect of different concentrations of fertiliser on the yield of 4 varieties of rice, A, B, C and D.



(a) Which variety gave the highest yield with no fertiliser?

..... [1]

(b) Describe the effect of increasing the concentration of fertiliser on the yield from variety A.

.....

..... [2]

(c) What is the effect on variety D of increasing the concentration of fertiliser from 60 to 80 kg/hectare?

.....

..... [2]

(d) What is the difference in yield between varieties A and D when 100kg/hectare of fertiliser is applied? Show your working.

Answer..... [2]

TOTAL / 7

High Demand Questions QUESTIONSHEET 13

Cubes of potato were placed in beakers of soil. The beakers were sealed and kept in different conditions.
The mass of the potatoes was measured at the start, after 3 days, 5 days and 7 days.
The table shows the results.

Conditions	**Mass of potato (g)**			
	At start	**After 3 days**	**After 5 days**	**After 7 days**
Damp 20°C	50	32.4	19.8	8.6
Dry 20°C	50	48.3	44.2	40.3
Damp 5°C	50	49.1	46.7	44.3
Dry 5°C	50	49.7	49.1	48.5
Damp 45°C	50	49.5	49.0	48.8
Dry 45°C	50	49.8	49.4	49.1

(a) In which conditions did the potato lose most mass after 5 days?

..... [1]

(b) In which condition did the potato lose least mass after 7 days?

..... [1]

(c) In which conditions did the potato lose approximately 20% of its mass after 7 days?

..... [1]

(d) Calculate the percentage loss of the potato, when kept in damp conditions at 20°C after 3 days.

Answer ..... [2]

(e) (i) Name the process which is responsible for the loss in mass of the potato.

..... [1]

(ii) Name **two** types of organism which carry out this process.

1. ..... [1]

2. ..... [1]

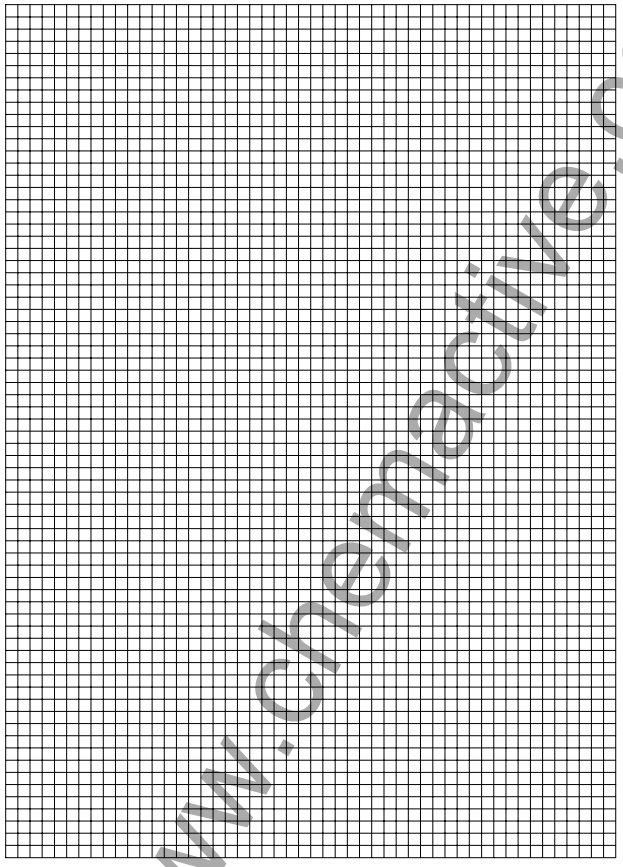
TOTAL / 8

High Demand Questions QUESTIONSHEET 14

The table shows the amount of carbon dioxide in the atmosphere from 1800 to 2000.

Year	Carbon dioxide/ppm
1800	280
1850	285
1900	300
1950	330
2000	365

(a) On a graph grid, plot a line graph of these figures. [4]



(b) During which 50 year period has the rise in carbon dioxide level been the greatest?

..... [1]

(c) The mass of carbon dioxide released each year is currently 750 million tonnes.
Of this mass, 80% comes from the combustion of fuel and the remainder from deforestation.
Calculate the mass which comes from combustion.

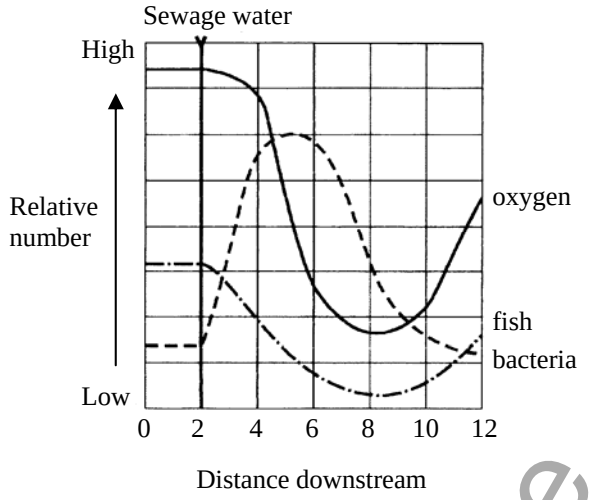
.....

..... [2]

TOTAL / 7

High Demand Questions QUESTIONSHEET 15

The graph shows the effect of sewage entering a river on the oxygen level and the relative numbers of bacteria and fish.



(a) How are the bacteria affected by the sewage entering the river?

..... [1]

(b) (i) How are the fish affected by the sewage entering the river?

..... [1]

(ii) What is the reason for this change?

.....

..... [2]

(c) As the distance downstream increases the concentration of sewage falls.
Suggest two reasons for this.

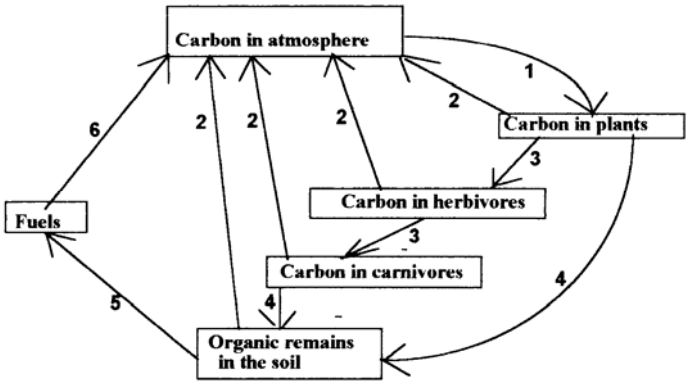
.....

..... [2]

TOTAL / 6

High Demand Questions QUESTIONSHEET 16

The diagram shows the carbon cycle.



(a) In what form does carbon exist in the atmosphere?

.....[1]

(b) What process is represented by,

(i) arrow 1?

.....[1]

(ii) arrow 2?

.....[1]

(iii) arrow 5?

.....[1]

(iv) arrow 6?

.....[1]

(c) In 1978 the amount of carbon released into the atmosphere by process 6 was 4.8 billion tonnes.
In 1998 this had risen to 5.4 billion tonnes.
Calculate the percentage increase in the amount of carbon released.

Answer.....[2]

(Continued...)

QUESTIONSHEET 16 CONTINUED

(d) Describe, in detail, how carbon in the atmosphere becomes carbon present in organic remains in the soil.

.....

.....

.....

.....

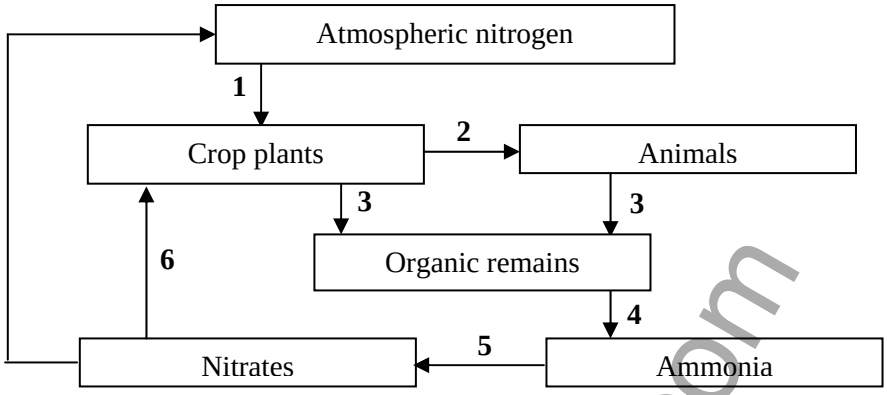
.....

..... [6]

TOTAL / 13

High Demand Questions QUESTIONSHEET 17

The diagram shows the nitrogen cycle.



(a) In what form do the plants absorb nitrogen?

..... [1]

(b) Which numbered process represents,

(i) decay?

..... [1]

(ii) nitrification?

..... [1]

(iii) nitrogen fixation?

..... [1]

(iv) Which numbered process represents feeding?

..... [1]

(c) How can farmers increase the nitrogen available to crop plants?

..... [1]

(d) Explain how nitrogen in animal tissue becomes nitrogen in the atmosphere.

.....

.....

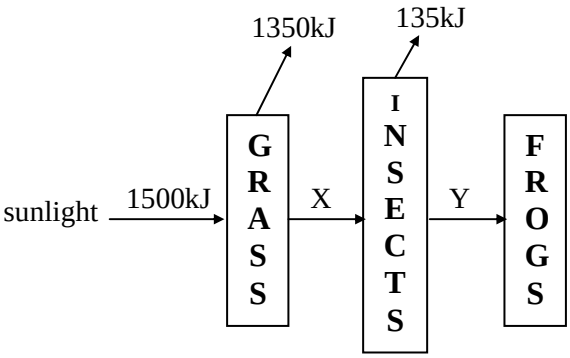
.....

..... [4]

TOTAL / 10

High Demand Questions QUESTIONSHEET 18

The diagram shows the energy passing through a food chain.



(a) Calculate the amount of energy available to insects (X).

..... [1]

(b) Calculate the amount of energy available to the frogs (Y).

..... [1]

(c) What percentage of the original energy from sunlight reaches the insects?

Answer ..... [2]

(d) Name two ways in which energy is lost by insects.

1. ..... [1]

2. ..... [1]

(e) Use the information on the diagram to explain why food chains rarely have more than five stages.

.....

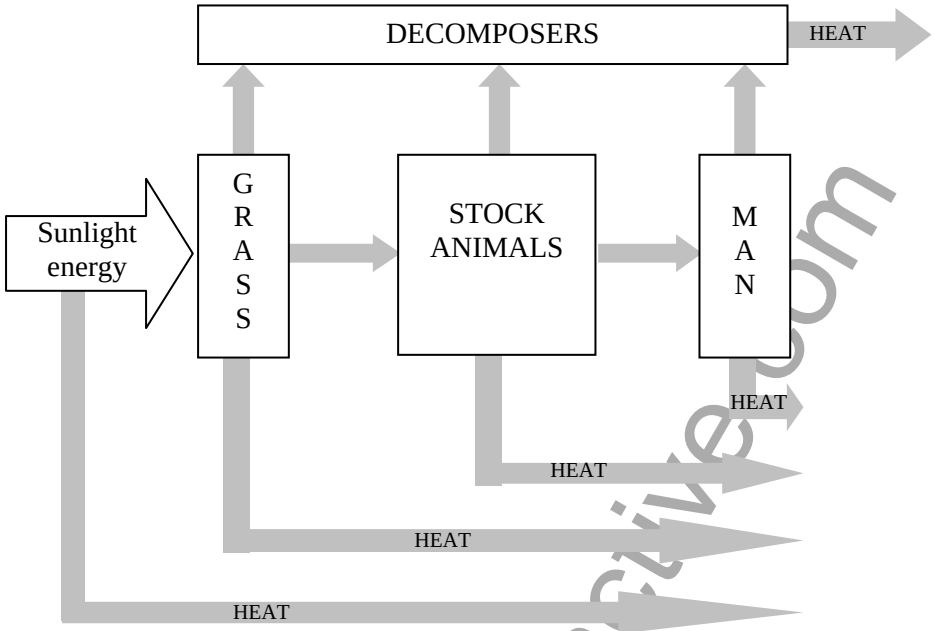
..... [2]

TOTAL / 8

High Demand Questions QUESTIONSHEET 19

Pests can reduce the yield of crop plants. The amount of energy transferred from crops to the stock animals and, eventually, to man can be significantly reduced.

(a) The diagram shows how energy flows through a managed grass crop.
The width of the arrows in the diagram represents the amount of energy being transferred.



(i) Give two reasons why not all the light energy reaching the ecosystem is used in producing food materials in the grass.

1. .....

..... [1]

2. .....

..... [1]

(ii) A significant amount of the energy transferred to the stock animals is not transferred to man. Suggest two strategies a farmer could adopt in order to minimise this energy loss form his stock animals.

1. Strategy

..... [1]

Explanation

.....

..... [1]

2. Strategy

..... [1]

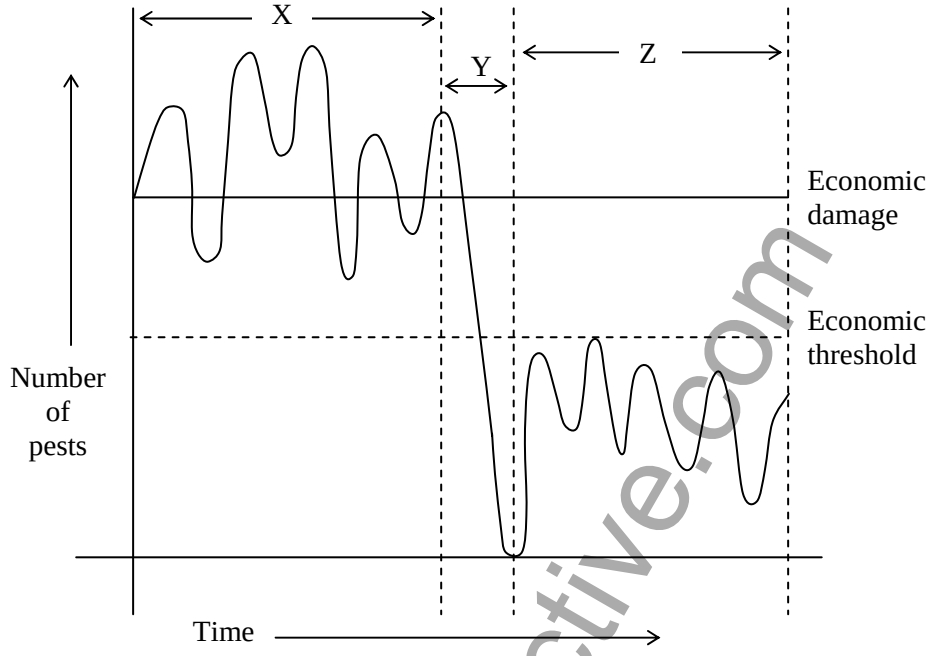
Explanation

..... [1]

TOTAL / 6

High Demand Questions QUESTIONSHEET 20

(a) Populations of living things vary over time. The graph shows how the population of a crop pest varied over a number of years.



------ Economic threshold – level at which crop is still economically viable.

——— Economic damage – at this level crop is not economically viable.

(i) Suggest why the population of the pest varied over period X.

.....

..... [2]

(ii) Did the pest threaten the livelihood of the farmer at any time? Explain your answer.

.....

..... [2]

(b) (i) Describe the change in the pest population over period Y

.....

..... [2]

(ii) Suggest how this change was brought about.

..... [1]

(c) Suggest the most likely reason for the decrease in numbers of pests over the period of time marked Z. Explain your answer.

.....

..... [2]

TOTAL / 9

High Demand Questions QUESTIONSHEET 21

The greenhouse effect is due to the build up of certain gases in the earth's atmosphere. One result of the greenhouse effect may be global warming.

(a) Name two gases which are thought to contribute to the greenhouse effect.

1. ..... [1]

2. ..... [1]

(b)(i) What is meant by global warming.

..... [1]

(ii) One consequence of global warming is predicted to be a rise in sea levels. Suggest how this would be caused.

..... [1]

(iii) Suggest two consequences of a rise in sea levels.

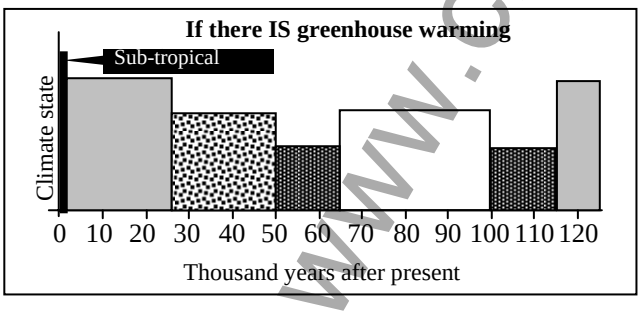
.....

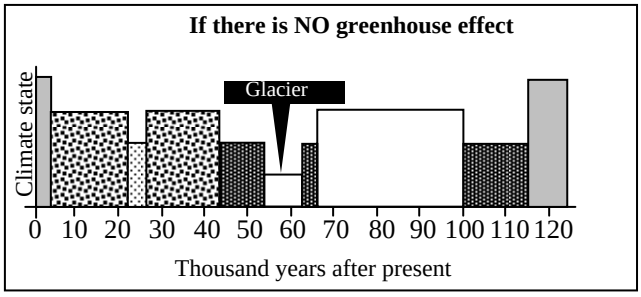
.....

.....

..... [2]

(c) One computer model of the climate in the UK over the next 125 000 years predicts significant changes with or without greenhouse effect. The graphs summarise the computer predictions.





Key

Sub-tropical	**Temperate**	**Boreal**	**Periglacial**	**Glacial**
Mediterranean, like Spain	UK climate now	Forest climate like Norway	Between forest and glacial, tundra	Edge of ice sheet like Greenland

(Continued...)

QUESTIONSHEET 21 CONTINUED

(i) Describe how the climate of the UK is predicted to change if there is greenhouse warming over the next 65 000 years

.....

.....

.....

..... [4]

(ii) State one difference in the prediction if there is no greenhouse affect over the next 65 000 years.

..... [1]

(iii) There is little difference between the two predictions beyond the next 65 000 years.
Suggest why.

.....

.....

..... [3]