



## AQA B3.4 Humans and their environment

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224 minutes



224 marks

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**Q1.** Human activities affect the environment.

(a) **List A** gives four human activities.

**List B** gives the effect of the activities on the environment.

Draw **one** line from each human activity in **List A** to its effect on the environment in **List B**.

List A Human activity	List B Effect on the environment
Digging a new quarry	Adds methane to the atmosphere
Spraying pesticides on crops	Pollutes hedges around fields
Growing rice	Reduces the land available for wild animals
Driving cars that release sulfur dioxide	Produces lots of litter
	Produces acid rain

(4)

(b) Human activities are increasing *global warming* .

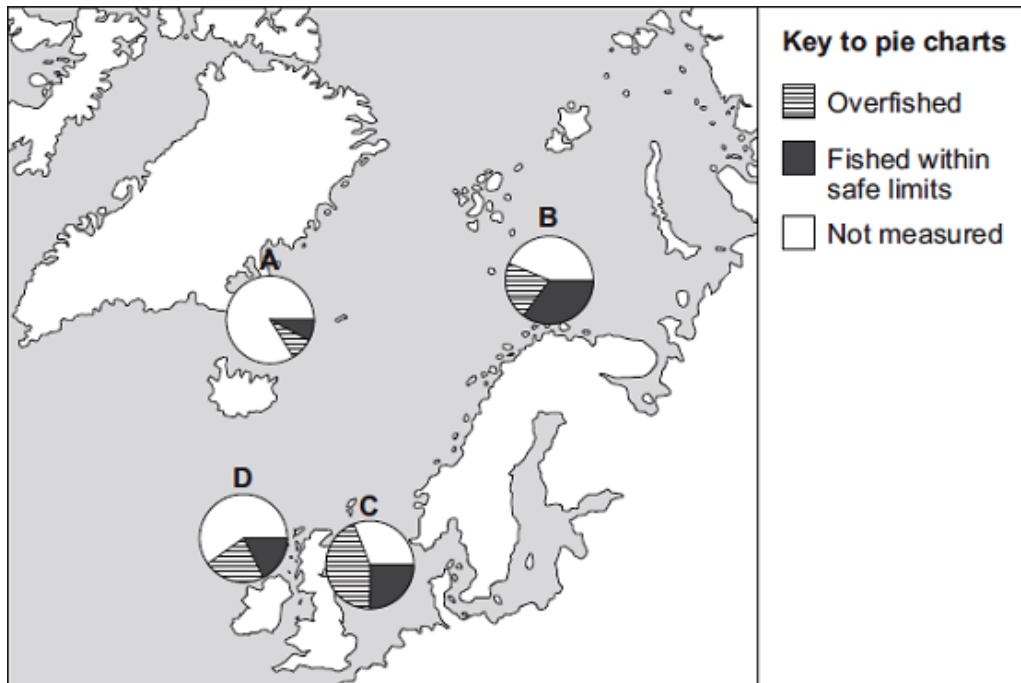
Give **two** effects of *global warming* on the environment.

1.....  
.....  
2.....  
.....

(2)

(Total 6 marks)

- Q2.** The map shows pie charts, **A**, **B**, **C** and **D**, that give information about fisheries in some of the seas around Europe.



© European Environment Agency

- (a) Which pie chart, **A**, **B**, **C** or **D**, shows the fishery with the largest amount of

overfishing?

(1)

- (b) It is important to maintain fish stocks high enough for breeding to continue.

Give the reason why.

.....

.....

(1)

- (c) Give **two** ways fish stocks can be conserved.

.....

.....

.....

.....

(2)

(Total 4 marks)

**Q3.** Scientists have produced many different types of GM (genetically modified) food crops.

(a) Use words from the box to complete the sentence about genetic engineering.

<b>clones</b>	<b>chromosomes</b>	<b>embryos</b>	<b>genes</b>
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GM crops are produced by cutting ..... out of the  
..... of one plant and inserting them into the cells of a crop plant.

(2)

(b) Read the information about GM food crops.

- Herbicide-resistant GM crops produce higher yields.
- Scientists are uncertain about how eating GM food affects our health.
- Insect-resistant GM crops reduce the total use of pesticides.
- GM crops might breed naturally with wild plants.
- Seeds for a GM crop can only be bought from one manufacturer.
- The numbers of bees will fall in areas where GM crops are grown.

Use this information to answer these questions.

(i) Give **two** reasons why some farmers are in favour of growing GM crops.

1 .....  
.....

2 .....  
.....

(2)

(ii) Give **two** reasons why many people are against the growing of GM crops.

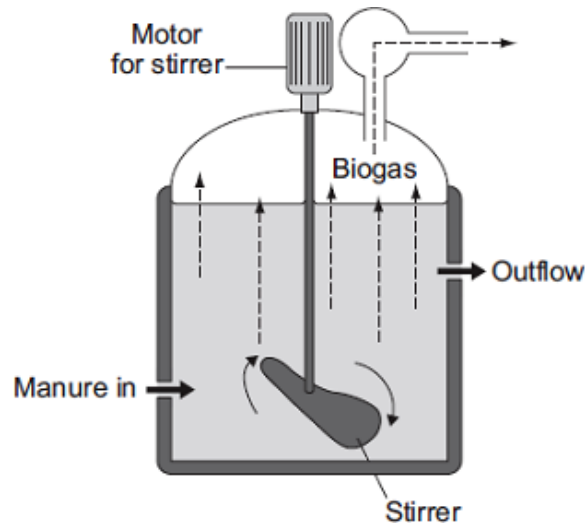
1 .....  
.....

2 .....  
.....

(2)

(Total 6 marks)

**Q4.** The diagram shows one type of biogas generator.



- (a) With this type of biogas generator, the concentration of solids that are fed into the reactor must be kept very low.

Suggest **one** reason for this.

Tick (✓) **one** box.

A higher concentration contains too little oxygen.

☐

A higher concentration would be difficult to stir.

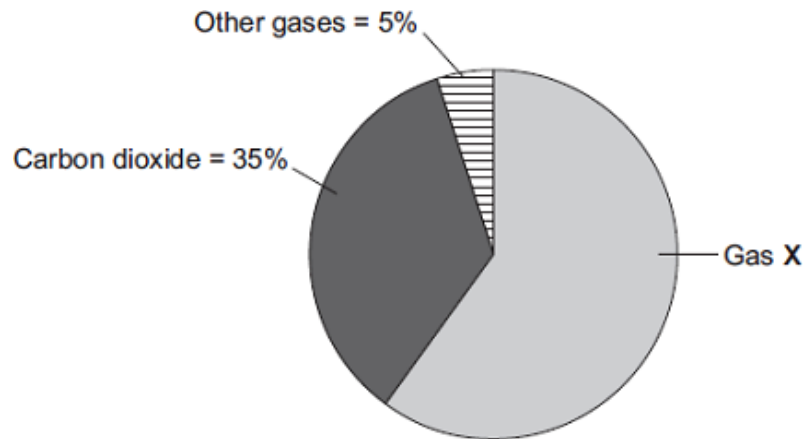
☐

A higher concentration contains too much carbon dioxide.

☐

(1)

- (b) The pie chart shows the percentages of the different gases found in the biogas.



Gas **X** is the main fuel gas found in the biogas.

- (i) What is the name of gas **X**?

Draw a ring around **one** answer.

**methane**

**nitrogen**

**oxygen**

(1)

- (ii) What is the percentage of gas **X** in the biogas?

Show clearly how you work out your answer.

.....  
 .....

Percentage of gas **X** = .....

(2)

- (c) If the biogas generator is not airtight, the biogas contains a much higher percentage of carbon dioxide.

Draw a ring around **one** answer in each part of this question.

- (i) The air that leaks in will increase the rate of

aerobic respiration.

anaerobic respiration.

fermentation.

(1)

(ii) The process in part (c)(i) occurs because the air contains

ammonia.

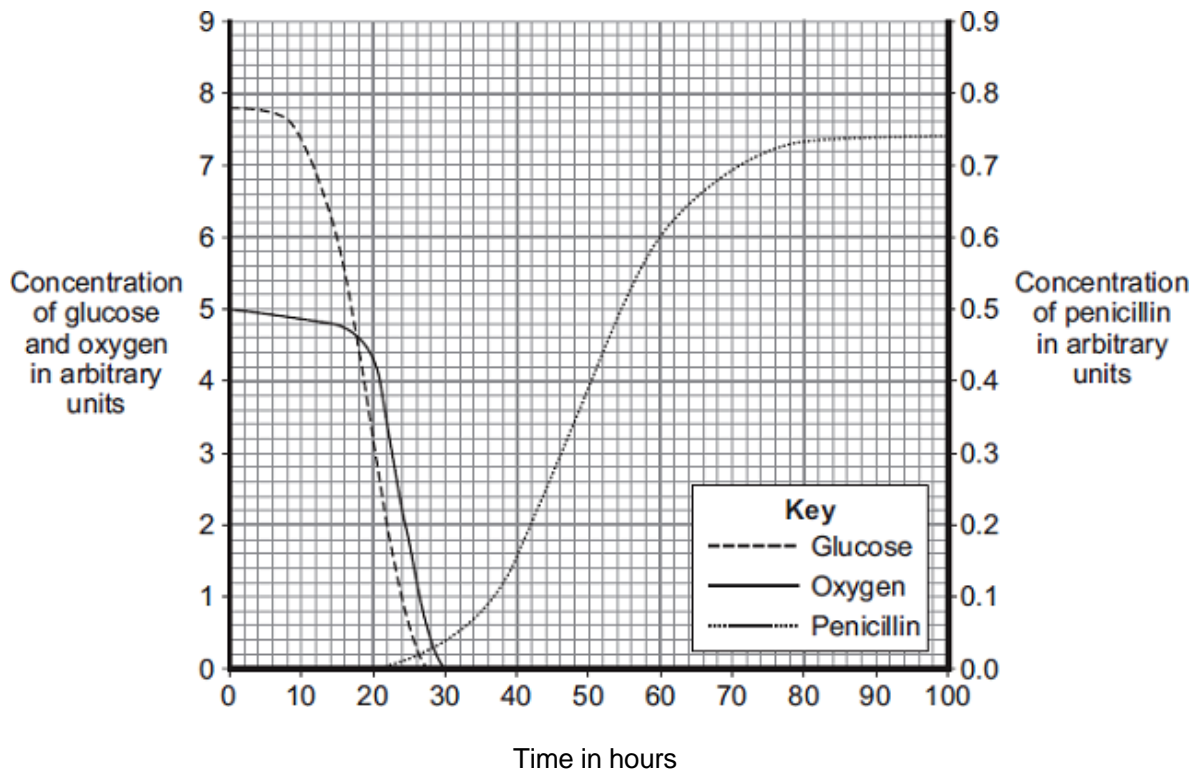
nitrogen.

oxygen.

(1)  
(Total 6 marks)

**Q5.** The mould *Penicillium* can be grown in a fermenter. *Penicillium* produces the antibiotic penicillin.

The graph shows changes that occurred in a fermenter during the production of penicillin.



(a) During which time period was penicillin produced most quickly?

Draw a ring around **one** answer.

**0 – 20 hours**

**40 – 60 hours**

**80 – 100 hours**

(1)

- (b) (i) Describe how the concentration of glucose in the fermenter changes between 0 and 30 hours.

.....

.....

.....

.....

(2)

- (ii) How does the change in the concentration of oxygen in the fermenter compare with the change in concentration of glucose between 0 and 30 hours?

Tick (✓) **two** boxes.

The oxygen concentration changes after the glucose concentration.

☐

The oxygen concentration changes before the glucose concentration.

☐

The oxygen concentration changes less than the glucose concentration.

☐

The oxygen concentration changes more than the glucose concentration.

☐

(2)

- (iii) What is the name of the process that uses glucose?

Draw a ring around **one** answer.

**distillation**

**filtration**

**respiration**

(1)

(Total 6 marks)



**Q6.** The photographs show four ways of farming.

**Growing wheat**



**Keeping sheep outside**



**Keeping pigs outside**

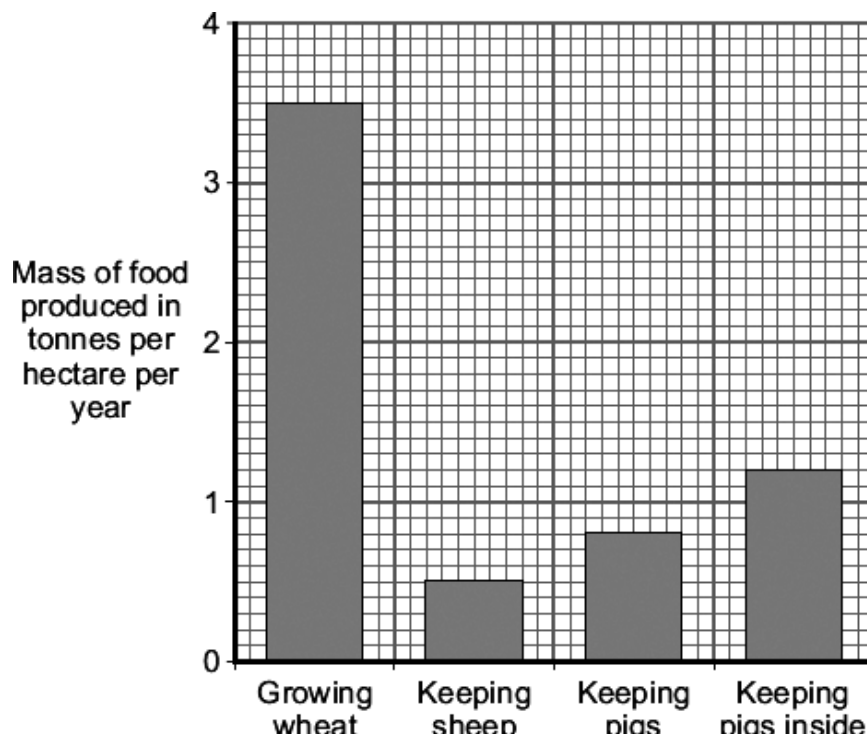


**Keeping pigs inside**



Growing wheat by Eileen Henderson [CC-BY-SA-2.0], via Wikimedia Commons. Keeping Sheep outside by Andrew Smith [CC-BY-SA-2.0], via Wikimedia Commons. Keeping Pigs outside by David Williams [CC-BY-SA-2.0], via Wikimedia Commons. Keeping Pigs inside supplied by iStockphoto/ Thinkstock.

The bar chart shows the amount of food produced from these four ways of farming.



sheep
pig
pig

outside
outside
inside

**Way of farming**

- (a) How much extra food can be produced when farmers grow wheat, compared with keeping sheep outside?

Show clearly how you work out your answer.

.....

.....

Answer ..... tonnes per hectare per year

(2)

- (b) Sheep eat grass.  
For every 1000 g of grass eaten, a sheep increases in mass by only 50 g.  
The other 950 g is lost.

How is the other 950 g lost?

Tick (✓) **two** boxes.

As oxygen from photosynthesis

☐

As faeces

☐

As meat

☐

As carbon dioxide from respiration

☐

(2)

- (c) (i) Pigs kept inside lose less energy than pigs kept outside.

Why?

Tick (✓) **two** boxes.

Pigs kept inside are fed more.

☐

Pigs kept inside are kept in small pens.

☐

Pigs kept inside are kept warm in the winter.

☐

Pigs kept inside are healthier.

☐

(2)

- (ii) Meat from pigs kept inside is usually cheaper than meat from pigs kept outside.

Give **one** reason why.

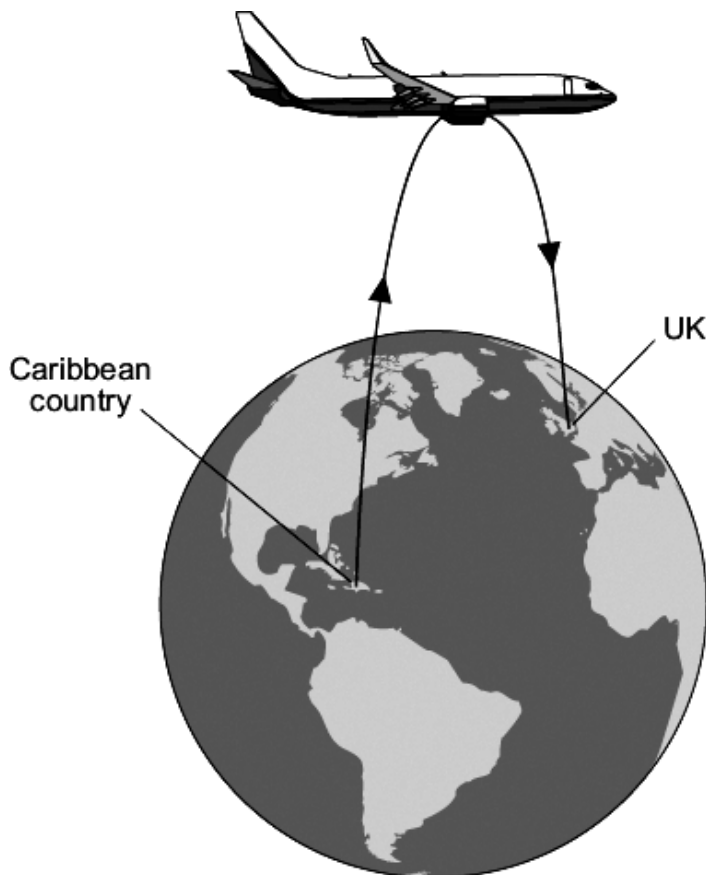
.....

.....

(1)  
(Total 7 marks)

- Q7.** Bananas are grown in countries in the Caribbean.

Bananas are transported by aeroplane from the Caribbean to the UK.



Complete the sentences.

- (a) The aeroplane uses a lot of ..... to fly.

(1)

- (b) (i) The aeroplane produces a waste gas called .....

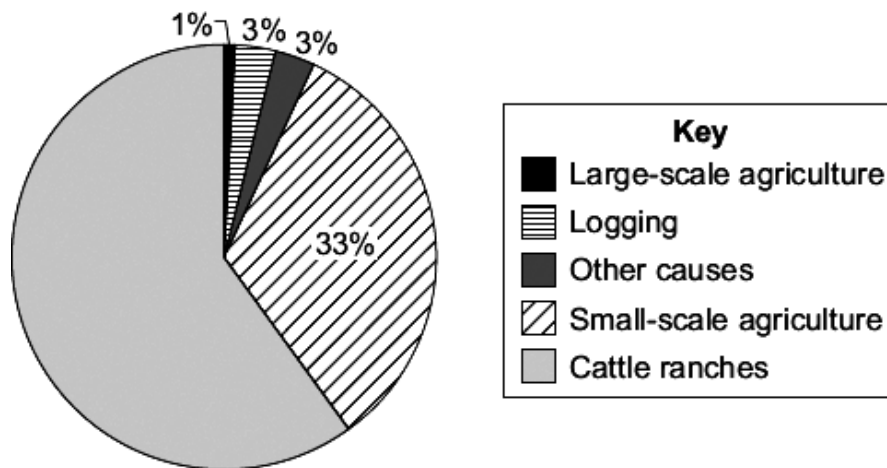
(1)

(ii) The waste gas pollutes the .....

(1)  
(Total 3 marks)

**Q8.** Large-scale deforestation is taking place in Brazil.

The pie chart shows the causes of deforestation in Brazil.



(a) Calculate the percentage of forest that has been destroyed for cattle ranches.

Show clearly how you work out your answer.

.....  
.....

Percentage = .....

(2)

(b) Cattle give off large amounts of methane into the atmosphere.

The methane causes the Earth's temperature to increase.

Give **two** effects of the temperature increase on the environment.

1 .....  
.....  
2 .....  
.....

(2)  
(Total 4 marks)

**Q9.** There are plans for a 'cattle factory' to be built in the UK.

Information about the cattle factory and traditional cattle farming in the UK is given below.



**Cattle factory**



**Traditional cattle farming**

Cattle factory by Pirhan [CC BY-SA 2.0], via Flickr. Traditional cattle farming by Mat Fascione[CC-BY-SA-2.0], via Wikimedia Commons

### **Cattle factory**

- There will be over 8 000 cows in three large sheds.
- Each cow will be milked three times a day.
- Each cow will produce about 50 litres of milk every day.
- Waste will be collected and used to produce electricity for 2 000 homes.
- Cows are kept near to each other so disease can spread easily.

### **Traditional cattle farming**

- Most farms have between 5 and 500 cows.
- The cows spend most of the time in fields.
- Cows are milked once or twice a day.
- Each cow produces up to 20 litres of milk a day.
- The waste is used as natural fertiliser for crops.

(a) Use the information to answer the questions.

(i) Give **two** reasons why some people think the cattle factory is a good idea.

- 1 .....
- .....
- 2 .....
- .....

(2)

- (ii) Give **two** reasons why some people think traditional farming is better than the cattle factory.

1 .....

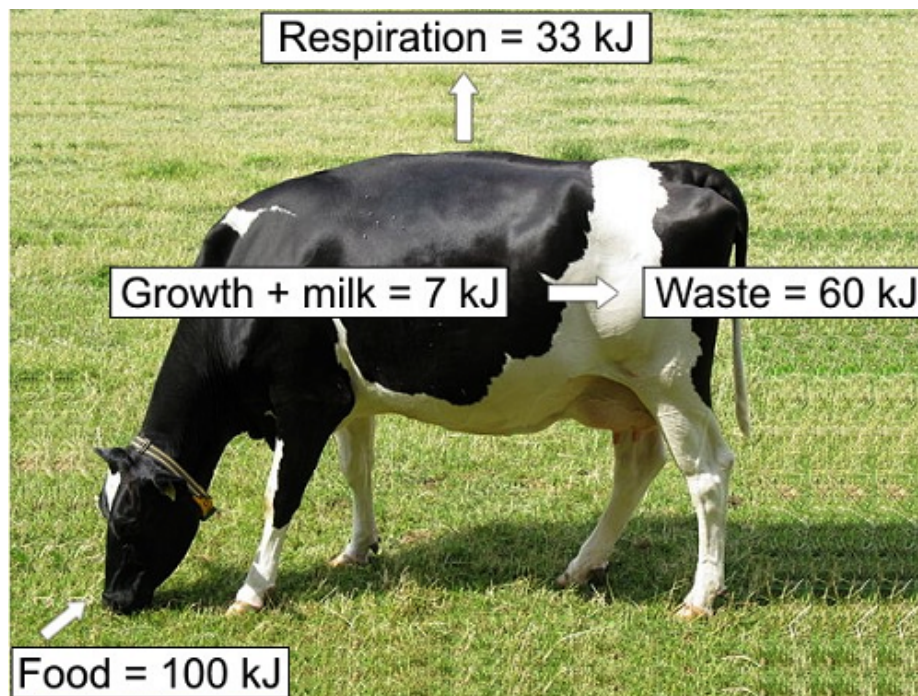
.....

2 .....

.....

(2)

- (b) The diagram shows what happens to 100 kJ of energy in the food eaten by a cow on a traditional farm.



By Dohduhdah (Own work) [Public domain], via Wikimedia Commons

Use your knowledge and the information in the diagram to answer this question.

Compare the transfer of energy from the food eaten by cows in the cattle factory with the energy transferred by cows on a traditional farm.

Use words from the box to complete the table.

more	less	the same
------	------	----------

Energy	Amount of energy transferred by cows in a cattle factory compared with cows on a traditional farm
transferred for growth and milk	
transferred in respiration	

(2)

- Q10.** The photograph shows water buffalo.  
The water buffalo are being used to get a field ready for growing rice.



By udeyismail [CC-BY-SA-2.0], via Wikimedia Commons

Draw a ring around the correct answer to complete each sentence.

- (a) Rice crops add to global warming because rice produces

methane.  
oxygen.  
sulfur dioxide.

(1)

- (b) Waste from the buffalo is spread on the rice fields.

This means that the farmer needs to use less

fertiliser.  
herbicide.  
pesticide.

(1)

- (c) Using buffalo instead of a tractor helps to save

biodiversity.  
fuel.  
trees.

(1)

- (d) Global warming is caused by

acid rain.  
the greenhouse effect.  
toxic chemicals.

(1)

(Total 4 marks)



**Q11.** The photographs show some ways in which humans affect the environment.

- (a) Coal-burning power stations give off smoke. The smoke contains many different gases.



By Norbert Kaiser (English: own work.) [CC-BY-SA-3.0], via Wikimedia Commons

Draw a ring around the correct answer to complete each sentence.

- (i) The gas which causes global warming is

carbon dioxide.

oxygen.

sulfur dioxide.

(1)

- (ii) The gas which causes acid rain is

methane.

oxygen.

sulfur dioxide.

(1)



- (b) The photograph shows a quarry.



By Thomas Bjørkan (Own work) [CC-BY-SA-3.0], via Wikimedia Commons

Draw a ring around the correct answer to complete each sentence.

- (i) Quarrying

releases methane into the atmosphere.

increases biodiversity.

reduces land available for animals and plants.

(1)

- (ii) Quarrying can be reduced by recycling

metals.

paper.

plastic

(1)

- (c) The photograph shows a farmer spraying fruit trees.



Photograph supplied by Hemera/Thinkstock

Chemicals in the spray kill insects on the trees.

Draw a ring around the correct answer to complete each sentence.

- (i) The spray contains

fertiliser.  
herbicide.  
pesticide.

(1)

- (ii) The chemical in the spray might also

kill other animals.  
kill plants.  
increase biodiversity.

(1)

(Total 6 marks)

**Q12.** Mycoprotein is produced from the fungus *Fusarium*. Mycoprotein is sometimes used instead of meat in foods for vegetarians.

(a) The table shows the amounts of some substances in mycoprotein and in chicken.

Substance	Mass in grams per 100 grams	
	Mycoprotein	Chicken
Protein	11.8	22.0
Dietary fibre	4.8	0.0
Fat	3.5	6.2
Carbohydrate	2.0	0.0
Cholesterol	0.0	0.1

(i) Draw a ring around the correct answers to complete the sentence.

Eating mycoprotein instead of chicken helps to lower the risk of heart disease because

mycoprotein contains no

fat

carbohydrate

and

cholesterol

mycoprotein contains less

dietary fibre.

fat.

carbohydrate.

(2)

(ii) A body-builder ate 4 kilograms of chicken each week to help him build up his muscles.

If he ate mycoprotein instead of chicken, he would need to eat about twice as much to have the same effect.

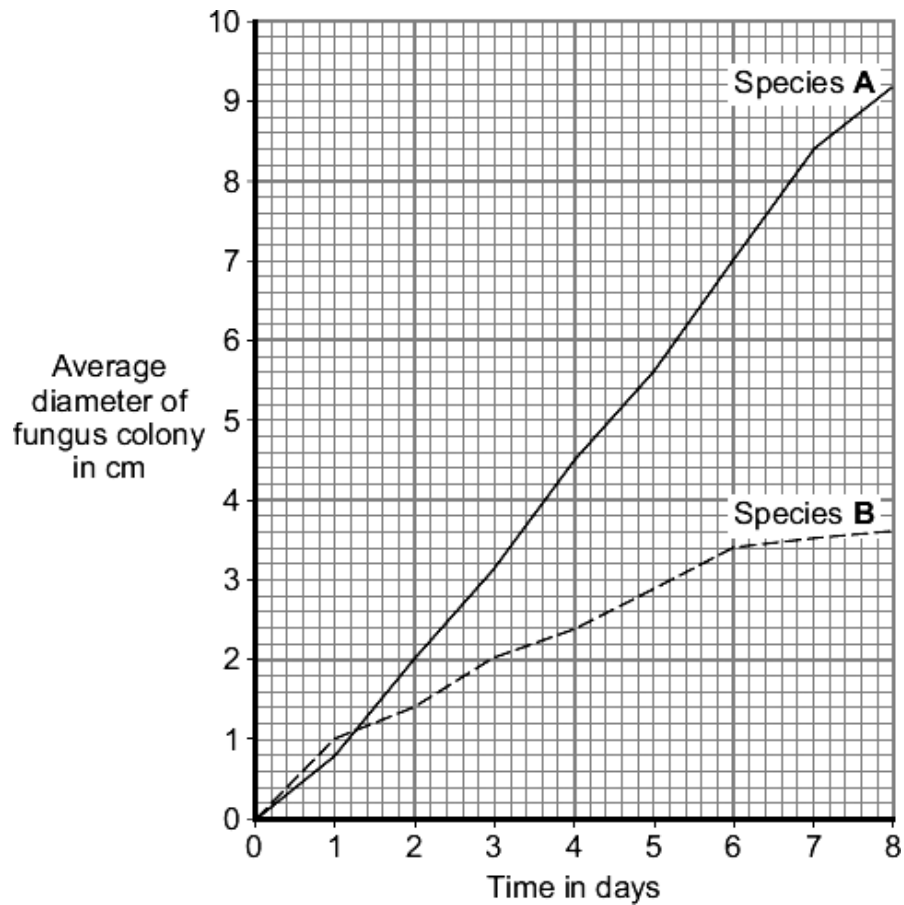
Use information from the table to give **one** reason why.

.....  
 .....

(1)

- (b) Scientists investigated the growth of two species, **A** and **B**, of the fungus *Fusarium*. The scientists grew the fungus on agar jelly in Petri dishes. They measured the diameter of a colony of each fungus every day for 8 days.

The graph shows the results.



- (i) Describe how the diameter of the colony of species **A** changed between day 0 and day 8.

.....  
.....  
.....  
.....

(2)

- (ii) Give **one** difference between the results for species **A** and the results for species **B**.

.....  
.....

(1)

- (c) Both Petri dishes contained the same nutrients.  
Both Petri dishes were kept at 25 °C.

When *Fusarium* is grown in an industrial fermenter, other factors also need to be controlled.

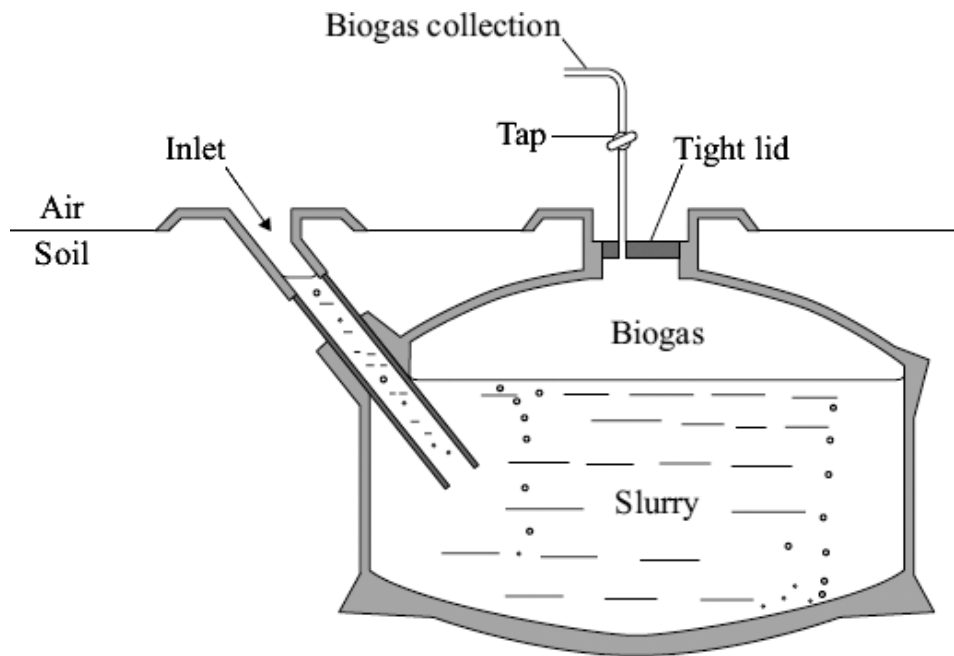
Give **two** of these other factors.

1 .....

2 .....

(2)  
(Total 8 marks)

**Q13.** The diagram shows one type of biogas generator.



(a) Give **two** advantages of having the biogas generator underground.

Tick (✓) **two** boxes.

It allows the digested slurry to soak into the soil.

☐

The biogas produced will be at a lower pressure.

☐

Very little of the biogas generator will be seen.

☐

It prevents unpleasant smells escaping.

☐

The temperature inside will not change much.

☐

(2)

- (b) The table shows the percentages of the different gases found in this biogas.

Gas	Percentage
Carbon dioxide	35.0
Hydrogen sulfide	1.5
Ammonia	1.5
Water vapour	2.0
Gas X	

Gas X is the main fuel gas found in biogas.

- (i) What is the name of gas X?

Draw a ring around **one** answer.

**hydrogen**

**methane**

**oxygen**

(1)

- (ii) What is the percentage of gas X in the biogas?

Show clearly how you work out your answer.

.....  
 .....  
 .....

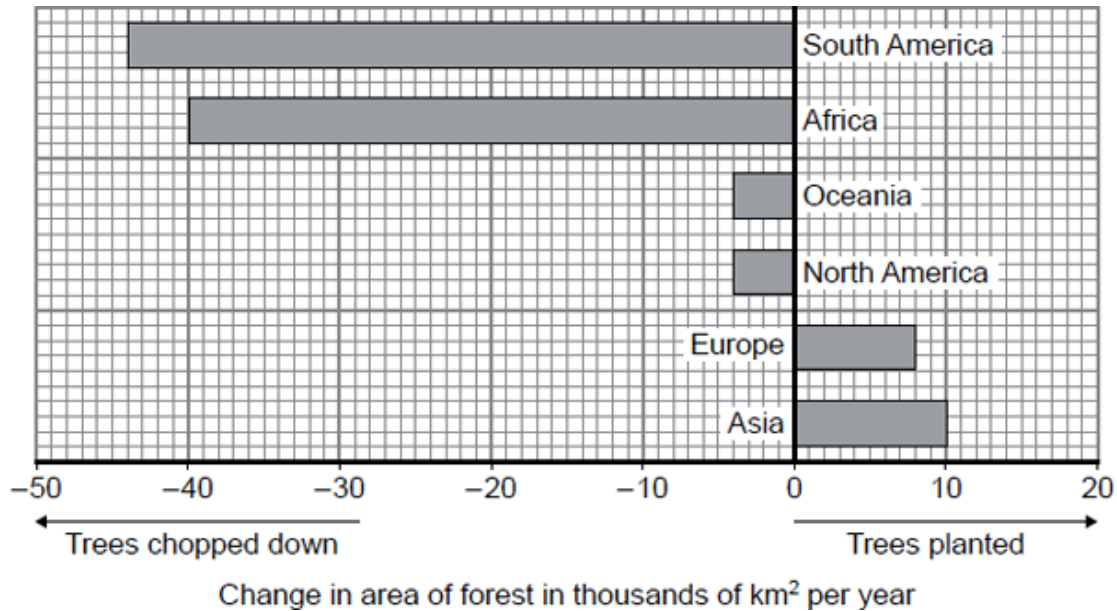
Percentage of gas X = .....

(2)

(Total 5 marks)

**Q14.** In many parts of the world, forests are being chopped down (deforestation) so that the land can be used to grow food crops. In other parts, trees are planted to produce new forests.

The graph shows how the area of forest in each of the continents is changing each year.



- (a) (i) What area of forest is being lost in Africa each year?

Area = ..... thousand km<sup>2</sup>

(1)

- (ii) Use **Steps 1, 2** and **3** to calculate the total change to the area of forest each year.

**Step 1** Calculate the total area of trees chopped down.

.....

Total area chopped down = ..... thousand km<sup>2</sup>

**Step 2** Calculate the total area of trees planted.

.....

Total area planted = ..... thousand km<sup>2</sup>

**Step 3** Use your answers from **Steps 1** and **2** to calculate the total change in the area of forest.

.....

Total change in area of forest ..... thousand km<sup>2</sup>

(3)



(b) Draw a ring around the correct answer to complete each sentence.

(i) Large scale deforestation reduces the number of species of

plants only.  
animals only.  
both animals and plants.

(1)

(ii) The remains of the trees are broken down into carbon dioxide by

lichens.  
microorganisms.  
plants.

(1)

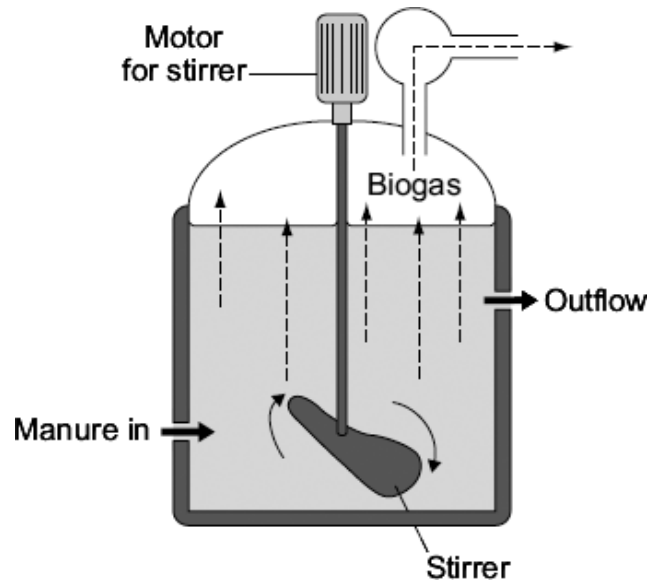
(iii) The gas released into the atmosphere when trees are burned is

carbon dioxide.  
methane.  
oxygen.

(1)

(Total 7 marks)

**Q15.** The diagram shows one type of biogas generator.



- (a) With this type of biogas generator, the concentration of solids fed into the reactor must be kept very low.

Suggest **one** reason for this.

Tick (✓) **one** box.

A higher concentration contains too little oxygen.

☐

A higher concentration would be difficult to stir.

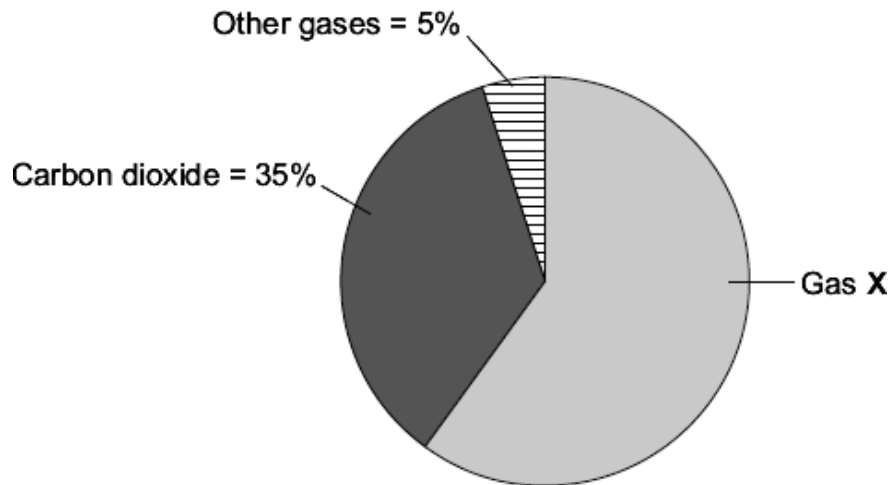
☐

A higher concentration contains too much carbon dioxide.

☐

(1)

- (b) The pie chart shows the percentages of the different gases found in this biogas.



Gas **X** is the main fuel gas found in this biogas.

- (i) What is the name of gas **X**?

Draw a ring around **one** answer.

**methane**

**nitrogen**

**oxygen**

(1)

- (ii) What is the percentage of gas **X** in the biogas?

Show clearly how you work out your answer.

.....  
 .....  
 .....

Percentage of gas **X** = .....

(2)

- (c) If the biogas generator is not airtight, the biogas will contain a much higher percentage of carbon dioxide.

Draw a ring around the correct answer to complete each sentence.

- (i) The air that leaks in will increase the rate of

aerobic respiration.

anaerobic respiration.

fermentation.

(1)

(ii) The process in part (c)(i) occurs because the air contains

ammonia.  
nitrogen.  
oxygen.

(1)  
(Total 6 marks)

**Q16.** There are many ways in which we can help the environment.

**List A** gives four methods of helping the environment.

**List B** gives the impact of the methods on the environment.

Draw **one** line from each method in **List A** to the impact on the environment in **List B**.

**List A**  
**Method**

increasing the amount of  
metal recycled

using fewer pesticides

reducing the number of cattle  
raised for food

increasing the amount of  
paper recycled

**List B**  
**Impact on the environment**

fewer forests are cut down

less methane is added to the  
atmosphere

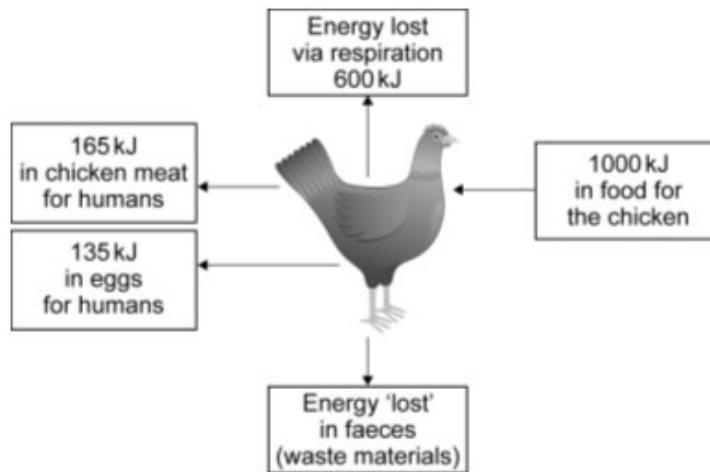
less pollution of rivers flowing  
through farmland

fewer quarries are dug to  
provide raw materials

no energy is wasted

(Total 4 marks)

**Q17.** The diagram shows how energy supplied in food to a chicken is transferred.



- (a) How much energy is transferred by the chicken into food for humans?

Amount of energy transferred to humans ..... kJ

(1)

- (b) Calculate the amount of energy 'lost' in faeces?

.....

Amount of energy 'lost' in faeces ..... kJ

(1)

- (c) Calculate the proportion of the energy supplied to the chicken in food that is 'lost'?

.....

Proportion of energy supplied to chicken that is lost .....

(1)

- (d) On many farms chickens are kept inside in small cages.

Complete the following sentence.

Compared with chickens kept outside, chickens kept inside in cages lose less energy because they .....

(1)

**(Total 4 marks)**

**Q18.** Humans damage the environment in many ways, including deforestation.



© Kazuyoshi Nomachi/Corbis

*In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

The diagram shows an area where the forest is being cleared.

Describe the reasons why deforestation is taking place and the effects that deforestation has on the environment.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**(Total 6 marks)**

**Q19.** Sulfur dioxide produced by human activity pollutes the atmosphere.

(a) (i) Name **one** human activity that produces sulfur dioxide.

.....

**(1)**

(ii) What effect does sulfur dioxide have on rainwater?

.....

.....

(1)

(b) The table shows the effects that two different concentrations of sulfur dioxide in the air had on the growth of rye grass plants.

	Sulfur dioxide concentration in the air in micrograms per m <sup>3</sup>	
	9.0	191.0
Number of leaves per plant	85.6	47.3
Total leaf area in cm <sup>2</sup>	417.2	203.6
Dry mass of stubble in grams	0.48	0.22

(i) Use information from the table to describe **one** effect of increasing the sulphur dioxide concentration on the leaves of the rye grass plants.

.....

.....

(1)

(ii) The stubble consists of the bases of the stems of the plants and the roots left in the soil after harvesting.

Use your answer to part (b)(i) to explain why the dry mass of the stubble was lower at the higher concentration of sulphur dioxide.

.....

.....

.....

.....

(2)

(Total 5 marks)

**Q20.** The photograph shows an area where a tropical forest is being cleared.



(a) Complete the sentences.

People could use timber from the forest for .....

The cleared land can be used for .....

Clearing forests increases the concentration of ..... in the atmosphere.

This increase causes global .....

**(4)**

(b) Clearing forests causes some species to become *extinct*.

(i) What is meant by *extinct*?

.....

.....

**(1)**



- (ii) It is important to prevent species from becoming extinct.

Give **one** reason why.

.....  
.....

(1)  
(Total 6 marks)

**Q21.** Ethanol (alcohol) can be mixed with petrol and used as a fuel in motor vehicles.

- (a) Which type of microorganism is used to make ethanol from sugar?

Draw a ring around **one** answer.

**bacterium**

**mould**

**yeast**

(1)

- (b) Read the information about ethanol and petrol.

**Ethanol**

- One litre releases 23.5 megajoules of energy when it is burned.
- It releases carbon dioxide and water when it is burned.
- It can be made from crops such as sugar cane and maize.

**Petrol**

- One litre releases 34.8 megajoules of energy when it is burned.
- It releases carbon dioxide, water, carbon monoxide, sulfur dioxide and oxides of nitrogen when it is burned.
- It is made from crude oil which is pumped out of the ground.

- (i) Use the information above to explain **two** advantages of using ethanol rather than petrol as a fuel in motor vehicles.

Explanation 1 .....

.....

.....

.....

Explanation 2 .....

.....

.....

.....

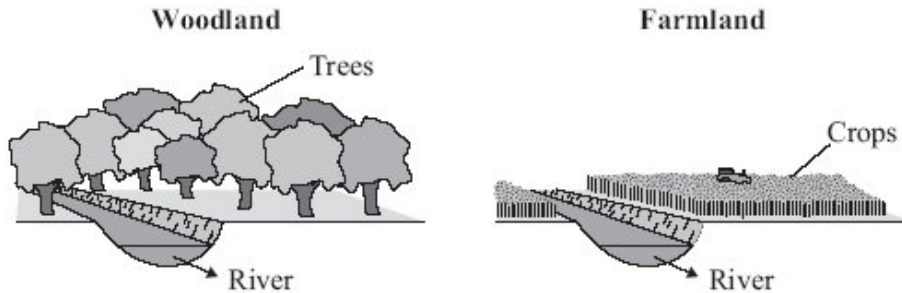
(4)

- (ii) Give **one** disadvantage of using ethanol rather than petrol as a fuel in motor vehicles.

.....  
.....

(1)  
(Total 6 marks)

- Q22.** The drawings show some woodland and some farmland. Both have a river flowing through.



- (a) (i) There is a wider variety of wildlife in the woodland than in the farmland.

Give **one** reason why.

.....  
.....

(1)

- (ii) Farmers remove woodland to provide space for growing crops.

Give **two** other reasons why humans remove woodland.  
Do **not** include the uses of wood in your answers.

1 .....  
.....  
2 .....  
.....

(2)

- (b) Many farmers spray chemicals on their fields.

Draw a ring around the correct word to complete each sentence.

- (i) To make crops grow larger, farmers use

fertilisers
herbicides
pesticides

.

(1)

(ii) To kill insects that feed on the crop, farmers use

fertilisers
herbicides
pesticides

(1)

(iii) There is a wider variety of wildlife in the river flowing through the woodland than in the river flowing through the farmland.

Give **one** reason why.

.....  
.....

(1)

(c) The population of the UK has increased over the last two hundred years.  
This increase in population has resulted in damage to the environment.

Apart from farming methods, give **two** ways in which humans damage the environment.

1 .....  
.....  
2 .....  
.....

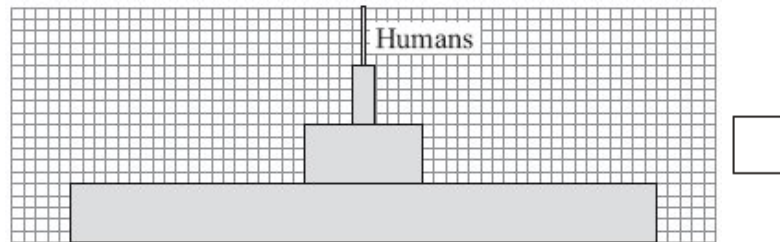
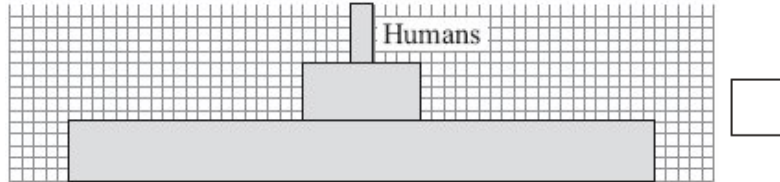
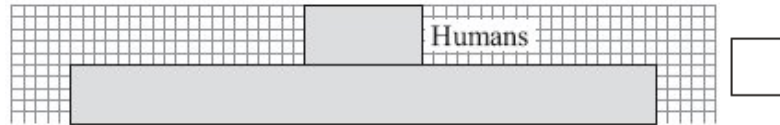
(2)

(Total 8 marks)

**Q23.** (a) The diagrams show three pyramids of biomass.

(i) Which pyramid would be the most efficient in providing food for humans?

Tick (✓) **one** box.



(1)

(ii) Give **one** reason for your choice.

.....  
 .....

(1)

(b) Pigs may be kept indoors or outdoors.

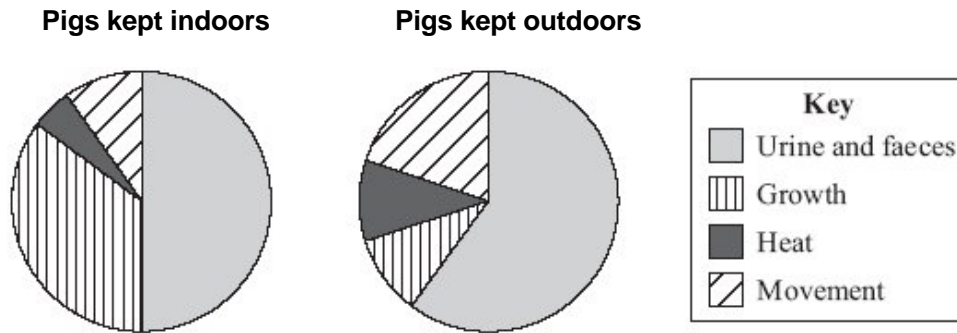
**Pigs kept indoors**



**Pigs kept outdoors**



The pie charts show what happens to the energy in the food eaten by pigs kept indoors and pigs kept outdoors.



- (i) Farmers make more profit from keeping pigs indoors than from keeping pigs outdoors.

Use information from the pie charts to explain why.

.....

.....

.....

.....

(2)

- (ii) Meat from pigs kept outdoors may cost more than meat from pigs kept indoors.

Some people prefer to buy meat from animals that have been kept outdoors.

Suggest **one** reason why.

.....

.....

(1)

(Total 5 marks)

- Q24.** The table gives information about the growth of different types of organism.  
The figures were obtained during the period of fastest growth for each organism.

Organism	Time taken to double in mass
Bacteria	40 minutes
Yeasts	2 hours
<i>Fusarium</i>	4 hours
Algae	5 hours
Soybeans	1 week
Cattle	8 weeks

- (a) (i) Which type of organism grows the fastest? ..... (1)

- (ii) How many times faster than cattle do soybeans double in mass?  
..... (1)

- (iii) *Fusarium* grows at its fastest rate in a fermenter.  
Some scientists put **one tonne** of *Fusarium* into a fermenter.

Use data from the table to calculate how much *Fusarium* there would be in the fermenter after 8 hours.

Draw a ring around **one** answer.

**2 tonnes**

**4 tonnes**

**8 tonnes**

(1)

- (b) *Fusarium* is used to make mycoprotein.

Read the information about substances found in mycoprotein.

- Protein – can be used for making cells, enzymes and antibodies.
- Fats – are rich in energy but large amounts in the diet can cause circulatory problems.
- Dietary fibre – helps to reduce the risk of colon cancer.

The table compares the composition of mycoprotein and beef.

Substance	Percentage of dry mass	
	Mycoprotein	Beef
Protein	47.2	68.3
Fat	13.5	30.1
Dietary fibre	19.2	0.0

Use the information above to answer the questions.

- (i) Give **two** reasons why it would be better to eat mycoprotein instead of beef.

1 .....

.....

2 .....

.....

(2)

- (ii) Give **one** reason why it would be better to eat beef instead of mycoprotein.

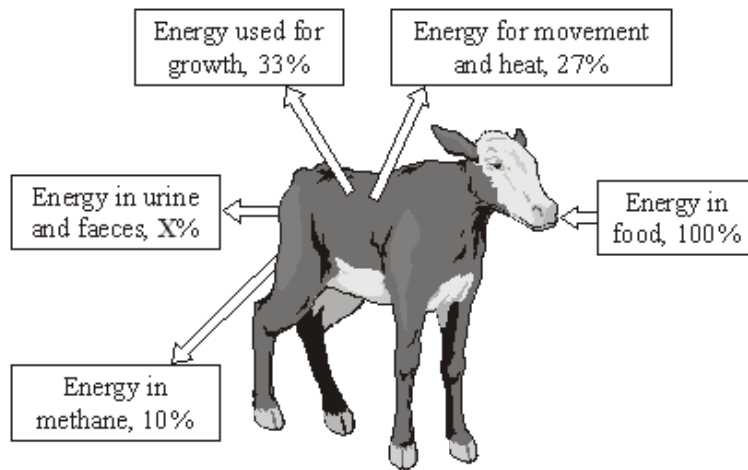
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.....

(1)

(Total 6 marks)

**Q25.** The diagram shows what happens to the energy in the food that a calf eats.



- (a) Calculate the % energy lost as urine and faeces (**X**).  
Show clearly how you work out your answer.

.....  
.....

Energy lost as urine and faeces ..... %

(2)

- (b) The energy in the food eaten by the calf in one day is 6 megajoules.

Calculate the amount of this energy that would be used for growth.  
Show clearly how you work out your answer.

.....  
.....

Energy used for growth ..... megajoules.

(2)

- (c) Which process in the body transforms energy in food into heat?

.....

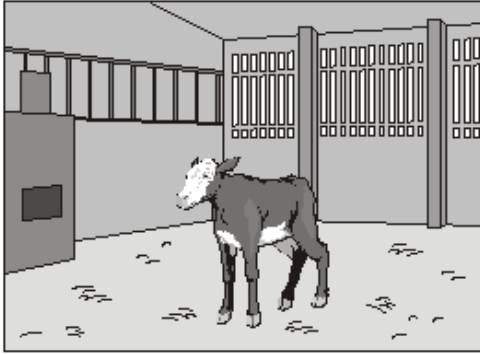
(1)



- (d) The pictures show two methods of raising calves indoors.

**Method 2** is now banned.

**Method 1**



**Method 2**



- (i) Calves raised indoors grow faster than calves raised outdoors.

Suggest **one** reason why.

.....  
.....

(1)

- (ii) **Method 2** was banned after public campaigns.

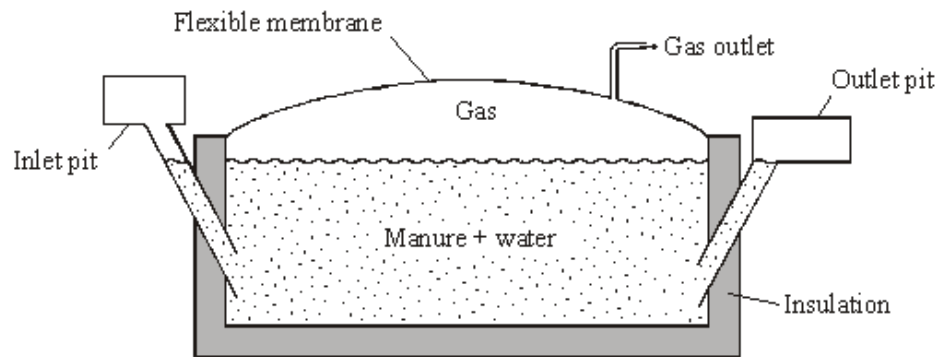
Suggest **one** reason why people campaigned against this method of rearing calves.

.....  
.....

(1)

(Total 7 marks)

**Q26.** The diagram shows one design of biogas generator used on a large dairy farm in the USA.



(a) What is the main, useful gas in biogas?

Draw a ring around **one** answer.

**carbon dioxide**

**hydrogen**

**methane**

(1)

(b) The insulation is installed so that biogas is produced at a faster rate.

Why is biogas produced at a faster rate?

.....  
 .....

(1)

(c) The table shows costs and income for this generator.

Item	Yearly costs in dollars	Yearly income in dollars
Electricity generated from biogas		22 800
Heating from burning biogas		4 200
Sale of fibre after biogas production		8 000
Operation and maintenance costs	10 000	

(i) Calculate the yearly profit from the biogas generator.

Show your working.

.....  
 .....  
 .....

(2)

- (ii) It cost 200 000 dollars to build the generator. Use your answer to part (c)(i) to calculate how many years it would take to pay back this cost.

.....

.....

.....

(2)  
(Total 6 marks)

**Q27.** In recent years, trees have been cut down to create more farm land. More cattle are kept and more rice is grown.

- (a) (i) Which gas has increased in the air as a result of trees being cut down?

Draw a ring around **one** answer.

**carbon dioxide**                      **oxygen**                      **sulphur dioxide**

(1)

- (ii) Which gas has increased in the air as a result of keeping more cattle and growing more rice?

Draw a ring around **one** answer.

**carbon monoxide**                      **hydrogen**                      **methane**

(1)

- (b) What effect may increases in these gases have on global temperatures?

Draw a ring around **one** answer.

**decrease**                      **increase**                      **stay the same**

(1)

- (c) List **three** ways in which humans have destroyed the habitats of other animals. Do **not** include cutting down trees in your answer.

1 .....

.....

2 .....

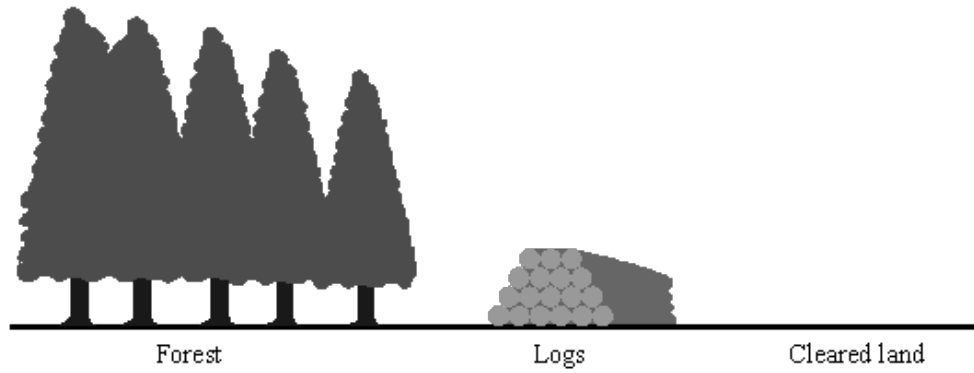
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3 .....

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(3)  
(Total 6 marks)

Q28.



Some large forest areas are being destroyed. This changes the amount of carbon dioxide in the atmosphere.

- (a) (i) State **one** use for the trees that are cut down.

.....

(1)

- (ii) State **one** use for the cleared land.

.....

(1)

- (iii) How has the destruction of forests affected the amount of carbon dioxide in the atmosphere?

.....

(1)

- (b) (i) How has the destruction of forests caused an increased Greenhouse effect?

.....

.....

.....

.....

.....

.....

.....

(4)

- (ii) State **one** effect of an increase in the Greenhouse effect.

.....

.....

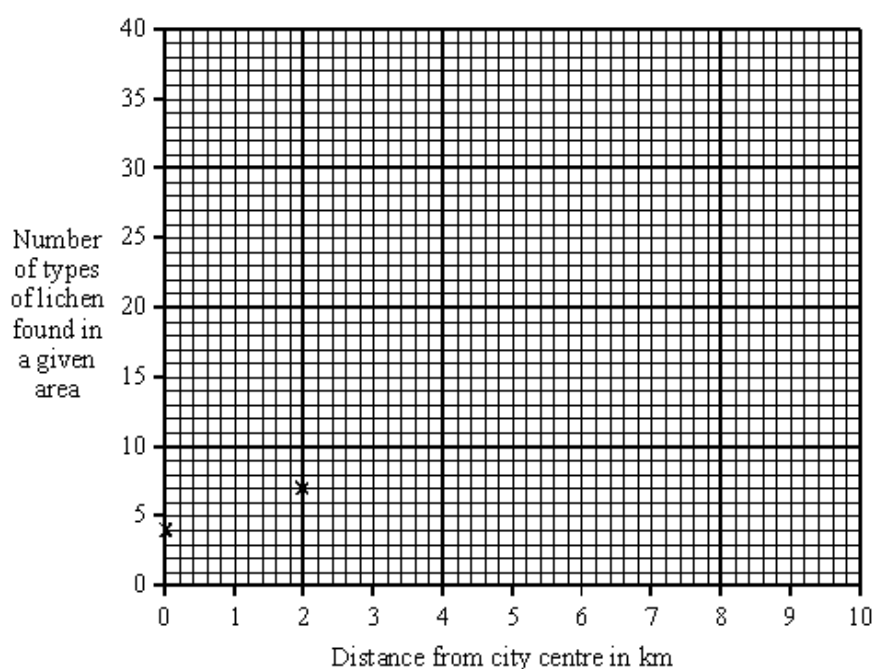
(1)  
(Total 8 marks)

##

Lichens are simple plants that are easily damaged by air pollution. A large number of different types of lichen is a good indicator of clean air. The table shows how many different types of lichen were recorded at set distances from a city centre.

Distance from city centre in km	Number of types of lichen found in a given area
0	4
2	7
3	10
5	20
6	25
7	40

- (a) Draw a graph of these results. The first two points have been plotted for you.



(2)

- (b) Use your graph to estimate the number of types of lichen at 4 km from the city centre.

.....

(1)

- (c) Use your graph to state a pattern that links the number of types of lichen with the distance from the city centre.

.....

.....

(1)

- (d) Since these data were collected, pollution in cities has decreased. Suggest **two** ways that the pollution in city centres has been reduced.

.....

.....

.....

(2)

- (e) Burning some fossil fuels produces acid rain. Explain how acid rain is formed and state **one** of its effects.

.....

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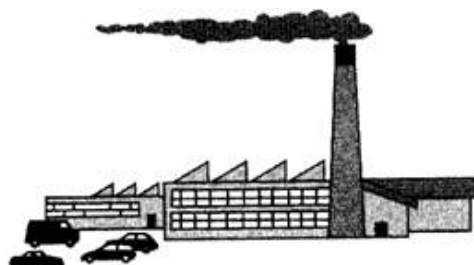
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(4)

(Total 10 marks)

**Q30.** This question is about pollution.



- (a) Use the following words to fill in the gaps. You may use each word once or not at all.

cars	dissolve	evaporate	fuels
kill	plants	soot	sulphur
		water	

Fossil ..... burnt by industry and  
 ..... can release .....  
 dioxide into the atmosphere. This can .....  
 in ..... to form acid rain. When this  
 falls it can ..... fish and damage  
 .....

(7)

- (b) Carbon dioxide is produced by many industries.

- (i) Name **two** types of environmental problems that a build up of carbon dioxide could cause.

1. ....

2. ....

(2)

- (ii) Apart from industry, how could carbon dioxide build up in the atmosphere?

.....

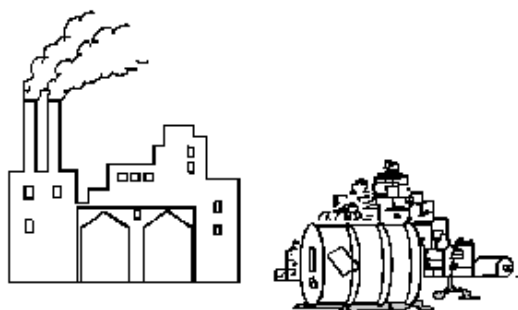
.....

.....

(1)

(Total 10 marks)

- Q31.** The drawings below show some of the effects that human activities have on the environment.



Use information from the drawings to give **two** ways in which these human activities affect other living organisms.

1 .....

.....

.....

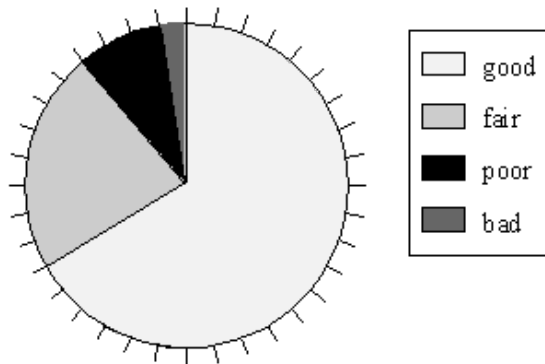
2 .....

.....

.....

(Total 2 marks)

**Q32.** The pie diagram shows the quality of river water in England and Wales in 1985.



(a) What proportion of the rivers had good quality water?

.....

(1)

(b) Give **two** ways in which rivers may become polluted.

1 .....

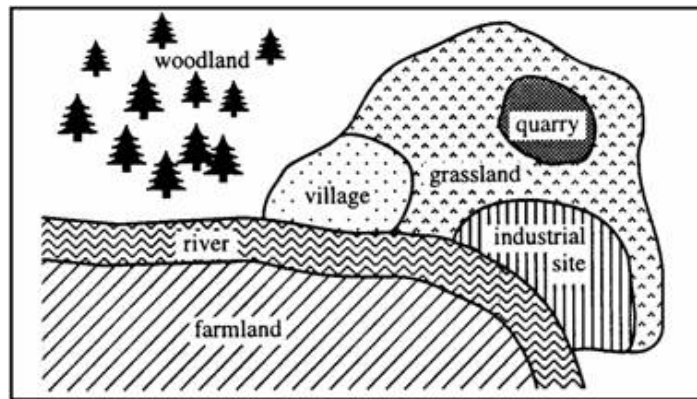
2 .....

(2)

(Total 3 marks)



**Q33.** The diagram shows a village and its surroundings.



- (a) Use words from the list to complete the sentences about pollution.

**oxygen      pesticides      sewage      sulphur dioxide**

The air might be polluted by ..... from the industrial site.

The river might be polluted by ..... from the village and  
by ..... from the farmland.

(3)

- (b) The owners of the quarry want to make it larger.

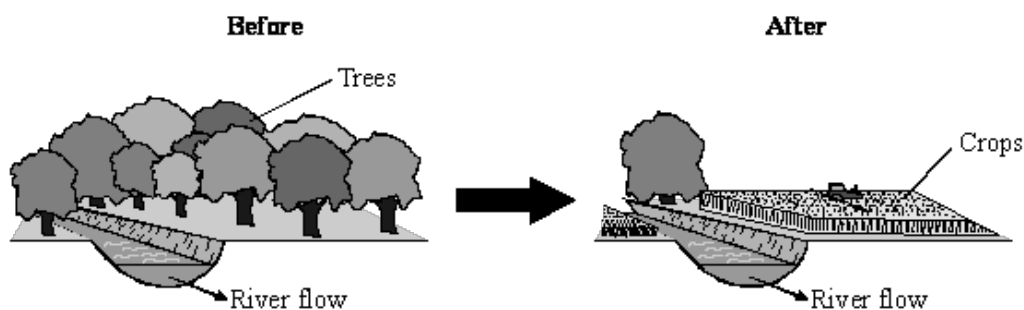
Give **one** effect that this might have on wild plants and animals that live near the quarry.

.....  
.....

(1)

(Total 4 marks)

**Q34.** In many countries, trees are removed so that more land can be used to grow crops.



- (a) When trees are removed it becomes more difficult for some plants and animals to survive. Give **one** reason why.

.....  
 .....

(1)

- (b) Farmers often spread chemicals on their fields before growing crops. When the crops are growing, the farmers sometimes spray them with toxic chemicals. These chemicals may be washed from the fields and can pollute the rivers.

Name **two** types of these chemicals that might pollute rivers.

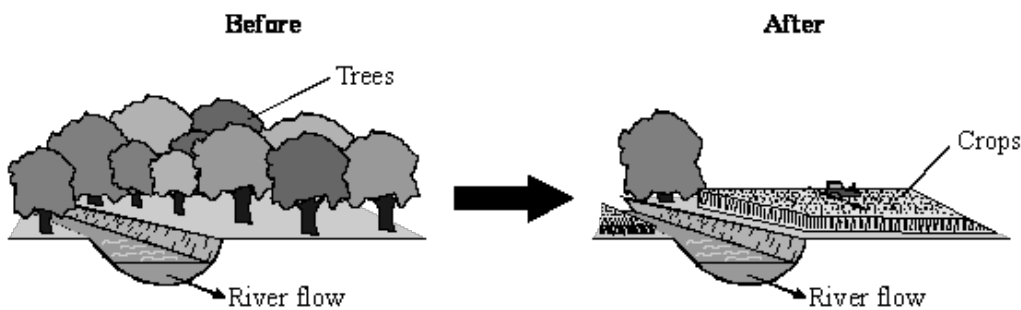
1 .....

2 .....

(2)

(Total 3 marks)

**Q35.** In many countries, trees are removed so that more land can be used to grow crops.



- (a) When trees are removed it becomes more difficult for some plants and animals to survive. Give **one** reason why.

.....  
 .....

(1)

- (b) Farmers often spread chemicals on their fields before growing crops. When the crops are growing, the farmers sometimes spray them with toxic chemicals. These chemicals may be washed from the fields and can pollute the rivers.

Name **two** types of these chemicals that might pollute rivers.

1 .....

2 .....

(2)

(Total 3 marks)

