1 The world's rainforests could completely vanish in a hundred years at the current rate of deforestation.

(a) Suggest two reasons why humans are removing rainforest.

(2)

1 .....

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2 .....

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(b) (i) Explain how deforestation can change the balance of gases in the atmosphere.

(2)

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(ii) Suggest how deforestation can change the soil structure.

(2)

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(c) Suggest how countries can reduce the impact of deforestation.

(2)

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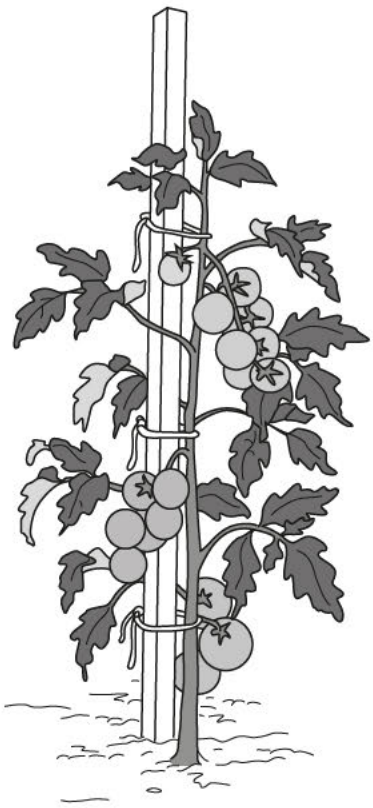
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(Total for Question = 8 marks)

2 The picture shows a tomato plant grown in a glasshouse.



The production of tomatoes is affected by an insect pest called the tomato leaf miner.
The photograph shows a tomato leaf that has been damaged by the tomato leaf miner.



The adult female leaf miner lays eggs on tomato leaves that develop into maggots (larvae). These maggots feed on leaf mesophyll tissue inside the leaf.

(a) Explain how feeding on mesophyll tissue will affect tomato production.

(3)

(b) (i) Pesticide are no longer successful in controlling the pest because the population of resistant forms of the leaf miner has increased.

Use your knowledge of natural selection to explain why the population of resistant forms of the leaf miner has increased.

(4)

(ii) Suggest one other reason why using pesticide spray to control the leaf miner has not been successful.

(1)

(c) The release of an insect species called *Trichogramma* has been successful in controlling the leaf miner. *Trichogramma* feeds on the leaf miner.

Name this type of pest control.

(1)

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(d) Suggest why the release of sterile male tomato leaf miners has also been successful in controlling the leaf miner.

(2)

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(e) Pheromone traps could also be used to control the leaf miner. Pheromones are smells that attract leaf miner males.

Design an investigation to find out if a pheromone trap would help to control the leaf miner.

Your answer should include experimental details and be written in full sentences.

(6)

(Total for Question = 17 marks)

3 Deforestation has an effect on the environment.

(a) (i) What is meant by the term **deforestation**?

(1)

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(ii) Explain the effects that deforestation has on the balance of oxygen and carbon dioxide in the atmosphere.

(3)

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(b) The release of pollutant gases into the atmosphere also has effects on the environment.

Complete the table by giving the names of the missing gases, and the effects of the gases on the environment.

(5)

Gas	Source	Effect on the environment
	cattle farming	
water vapour	combustion	
	burning fossil fuels	causes acid rain
	incomplete combustion	affects transport of oxygen in blood
CFC	refrigerators and air conditioning units	

(Total for Question = 9 marks)

4 Carbon dioxide, methane and nitrous oxide are all greenhouse gases.

(a) (i) Name a source of nitrous oxide.

(1)

.....

(ii) Name one other greenhouse gas.

(1)

.....

(b) The table shows the masses of three different greenhouse gases released into the atmosphere in the United Kingdom from 1990 to 2010.

Year	Mass of gas released each year in millions of tonnes		
	carbon dioxide	methane	nitrous oxide
1990	590.3	4.6	0.2
1995	566.7	4.0	0.2
2000	550.5	3.0	0.1
2005	552.0	2.2	0.1
2010	496.0	2.1	0.1

(i) Calculate the percentage decrease in the mass of carbon dioxide released between 1990 and 2010.
Show your working.

(2)

percentage decrease in mass = ... %

(ii) Suggest why the mass of carbon dioxide released has decreased from 1990 to 2010.

(3)

(iii) Describe the changes in the mass of methane released between 1990 and 2010.

(2)

(c) Explain the advantages of reducing the mass of greenhouse gases released into the atmosphere.

(5)

(Total for Question = 14 marks)