1 Crop plants are often grown in glasshouses where conditions can be carefully controlled. This is done in order to get the greatest crop yield.

(a) Explain how the following factors could affect crop yield.

(i) Increasing the temperature of the glasshouse

(3)

(ii) Providing a supply of fertiliser to the crop plants

(3)

(b) Sometimes a farmer needs to control an insect pest that might damage his crops.

He can do this by using either biological control or a chemical pesticide.

(i) Describe **one** example of the use of biological control.

(2)

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(ii) Give **three** advantages of using biological control instead of a chemical pesticide.

(3)

1 .....

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2 .....

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3 .....

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(Total for Question = 11 marks)

2 (a) Some nuclear power stations take in cold water from the sea and use it to cool their reactors. The warmed water is released back into the sea. This can cause thermal pollution because the increased water temperature has an effect on the concentration of dissolved oxygen.

The table shows the effect of water temperature on the concentration of dissolved oxygen.

Water temperature in °C	Concentration of oxygen in mg per litre
5	12.37
10	10.92
15	9.76
20	8.84

(i) Calculate the percentage change in concentration of oxygen when the water temperature rises from 10 °C to 15 °C. Show your working.

(2)

Answer = ...%

(ii) Use information from the table to explain why it would be unlikely for a fish farm to be situated near a power station.

(2)

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(b) The table lists some methods used to produce large numbers of fish on a fish farm.

Complete the table by stating how each method helps to increase fish production.

(3)

Method	How method increases fish production
adding antibiotics to the water	
using nets to cover tanks	
feeding small quantities of food frequently	

(c) Fish are a good source of protein in the human diet.

Describe what happens to fish protein in the gut of a human.

(5)

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(Total for Question = 12 marks)

3 Some rice farmers use ducks as a method of biological control.

The photograph shows ducks swimming in a rice paddy field.



© Takao Furuno

The ducks help rice plants to grow because they eat insects and weeds in the paddy fields.

(a) (i) Suggest how the ducks eating insects helps rice plants to grow.

(1)

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(ii) Explain how the ducks eating weeds helps rice plants to grow.

(2)

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(b) Explain why faeces from the ducks helps rice plants to grow.

(2)

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(c) The ducks stir up the soil in the rice paddy field with their feet, which increases the oxygen content of the soil.

Suggest how increasing the oxygen content of the soil helps rice plants to grow.

(2)

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(d) Using ducks as a method of biological control allows the farmer to grow rice without using herbicide or pesticide.

(i) Suggest what is meant by the term **herbicide**.

(1)

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(ii) Give three advantages of using biological control rather than using pesticide.

(3)

1 .....

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2 .....

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3 .....

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(Total for Question = 11 marks)