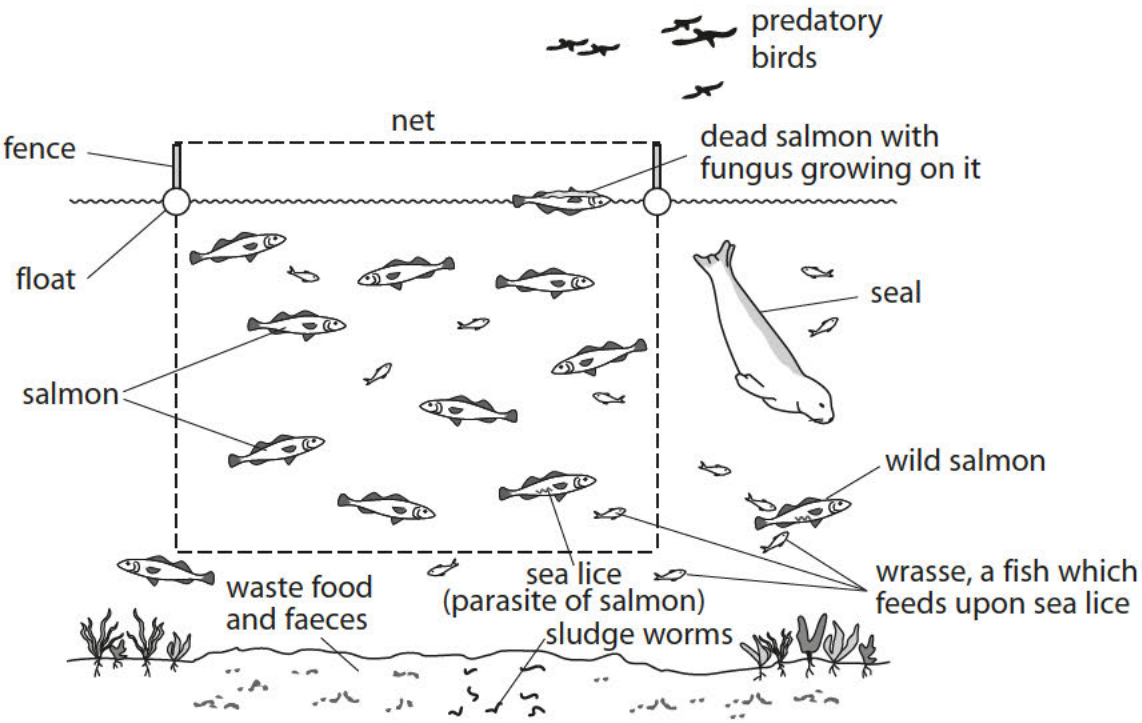
1 The diagram shows a salmon fish farm in the sea.



(a) Suggest three ways in which the net protects the salmon.

(3)

1 .....

2 .....

3 .....

(b) Waste food and faeces can collect in the mud beneath the fish farm.

Suggest how this could affect the growth of the salmon.

(3)

(c) Suggest what should be done with the dead salmon with fungus growing on it.

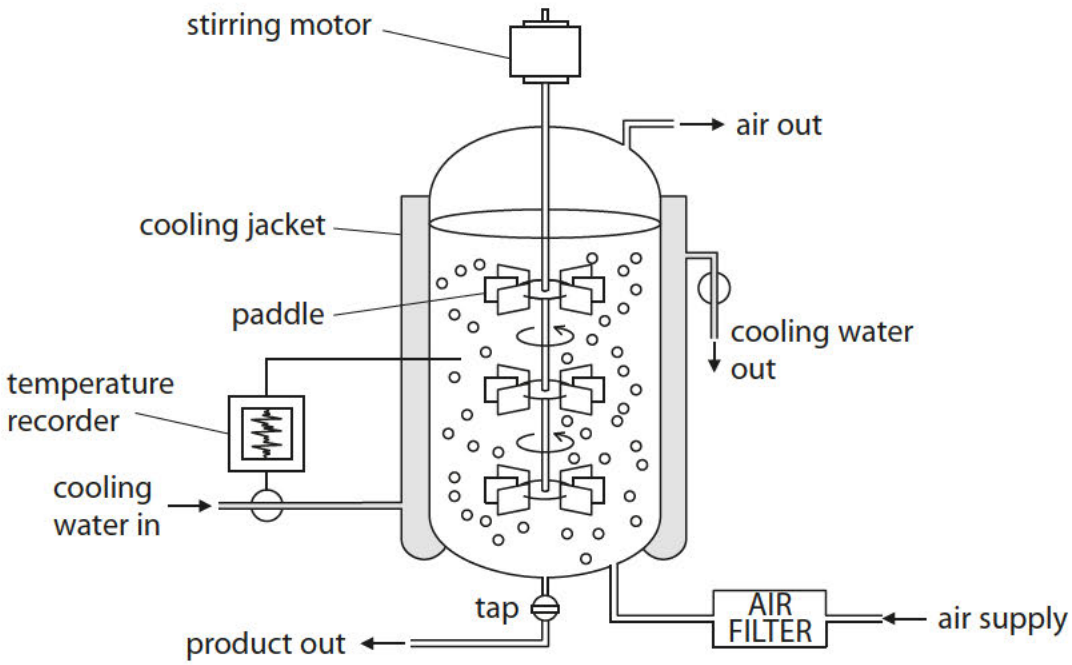
(2)

(d) Give the example of biological control shown in the diagram of the fish farm.

(1)

(Total for Question = 9 marks)

2 The diagram shows a fermenter used to grow microorganisms.



(a) Explain how temperature is controlled in the fermenter.

(2)

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(b) Explain why temperature must be controlled in the fermenter.

(2)

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(c) Explain the purpose of the paddles in the fermenter.

(2)

(d) Other than temperature, name **one** condition that needs to be controlled in a fermenter and state why it needs to be controlled.

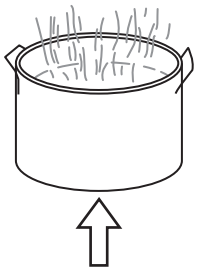
(2)

(e) Name a product that could be produced in this type of fermenter.

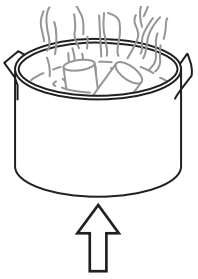
(1)

(Total for Question = 9 marks)

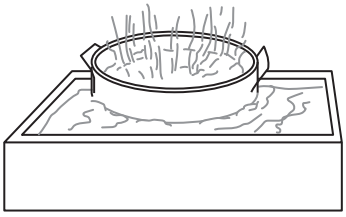
3 A student wants to make yoghurt. The diagram shows what she did.



stage 1
Pasteurise the milk for 30 minutes at 80 °C.



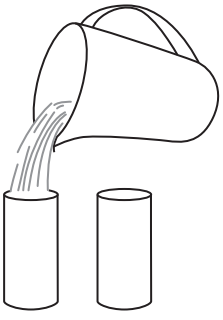
stage 2
Sterilise the yoghurt jars in boiling water for 15 minutes.



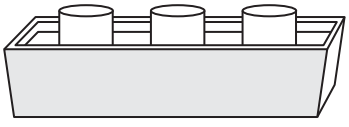
stage 3
Cool the milk to 45 °C.



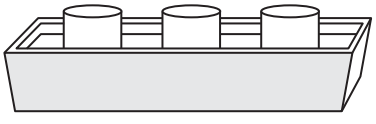
stage 4
Add some live yoghurt to the milk and mix well.



stage 5
Pour the milk into the sterilised jars and cover to avoid contamination.



stage 6
Put the jars in warm water (35 to 42 °C). The water should not cool below 35 °C.



stage 7
After four or five hours the yoghurt is ready. Remove the jars and keep them cool.

Yoghurt can be eaten cold on its own, or mixed with honey, fruit, cereal and many other foods.

(a) Which two stages help to improve the production of yoghurt by killing bacteria that compete with *Lactobacillus*?

(2)

..... and .....

(b) Explain why the milk needed to be cooled to 45 °C in stage 3.

(2)

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(c) Explain what could happen to the production of yoghurt if the jars used in stage 5 had not been sterilised in stage 2.

(2)

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(d) Explain what would happen to the production of yoghurt if the water cooled below 35 °C in stage 6.

(2)

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(e) The student added fruit to her yoghurt to improve the taste.

Suggest how adding fruit to yoghurt also helps to maintain healthy skin.

(1)

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(Total for Question = 9 marks)

4 Some food products are made using microorganisms.

The table gives information about the production of two of these food products.

(a) Complete the table by giving the missing information.

(5)

Food product	Name of organism used	Group organism belongs to	Substrate used	Type of respiration	Chemical product
	Saccharomyces (yeast)	fungus	glucose		ethanol
yoghurt		bacteria		aerobic	

(b) Explain one precaution that should be taken when making yoghurt so that it is safe for humans to eat.

(2)

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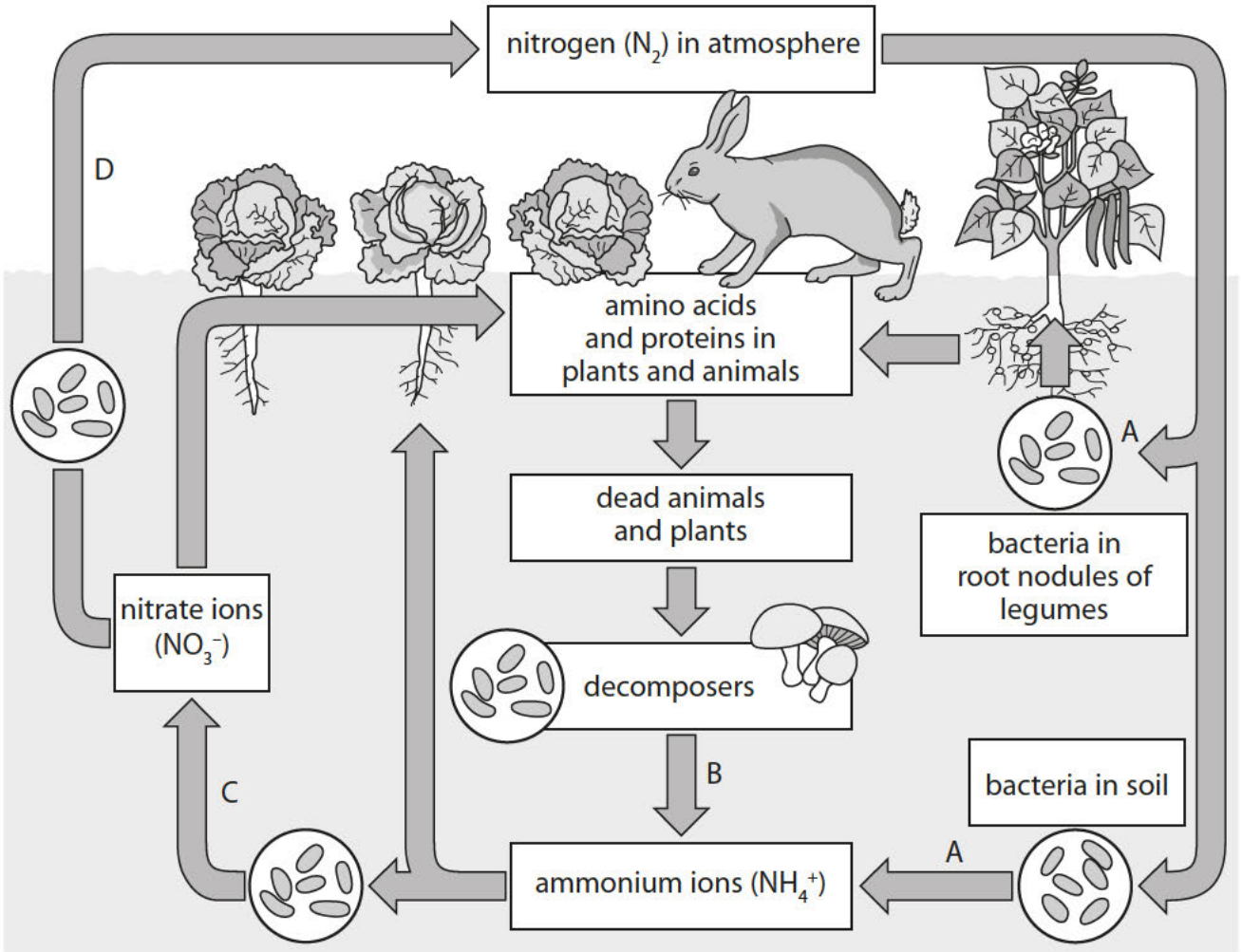
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(Total for Question = 7 marks)

5 The diagram shows the nitrogen cycle with four different stages labelled A, B, C and D.



(a) Name the processes A, B, C and D.

(4)

A .....

B .....

C .....

D .....

(b) Name two different groups of organisms that act as decomposers.

(2)

1 .....

2 .....

(c) The nitrogen in a nitrate ion in the soil can become the nitrogen in a protein molecule in an animal.

Explain how this happens.

(4)

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(d) Farmers sometimes add fertiliser to the fields in which they grow their crops.

Suggest two advantages of using animal waste as a fertiliser rather than using a chemical fertiliser.

(2)

1 .....

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2 .....

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(Total for Question = 12 marks)