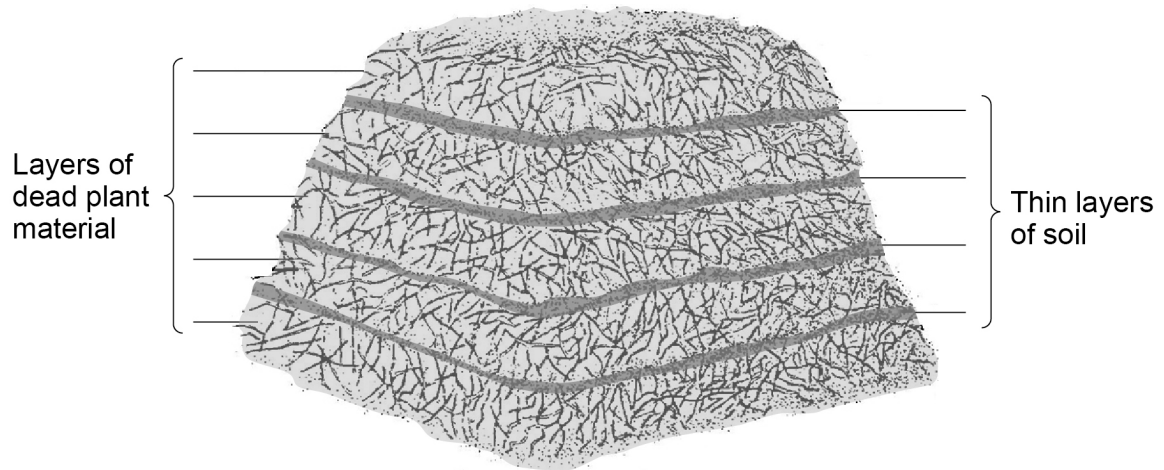**0 4** Gardeners sometimes make compost heaps from dead plant material.

The dead plants decay in the compost heap.

**Figure 8** shows a compost heap.

**Figure 8**



Layers of dead plant material

Thin layers of soil

**0 4 . 1** The thin layers of soil contain organisms that cause decay.

Which **two** types of organism cause decay?

**[2 marks]**

Tick (✓) **two** boxes.

Bacteria ☐

Fungi ☐

Grass ☐

Insects ☐

Worms ☐

The rate of decay in the compost heap depends on several environmental factors.

**0 4 . 2** Explain how the rate of decay would be affected by:

- an increase in oxygen concentration

- a temperature increase from 5 °C to 25 °C

**[3 marks]**

_____

_____

_____

_____

_____

_____

_____

_____

**0 4 . 3** Give **one** environmental factor needed for decay.

Do **not** refer to oxygen or temperature in your answer.
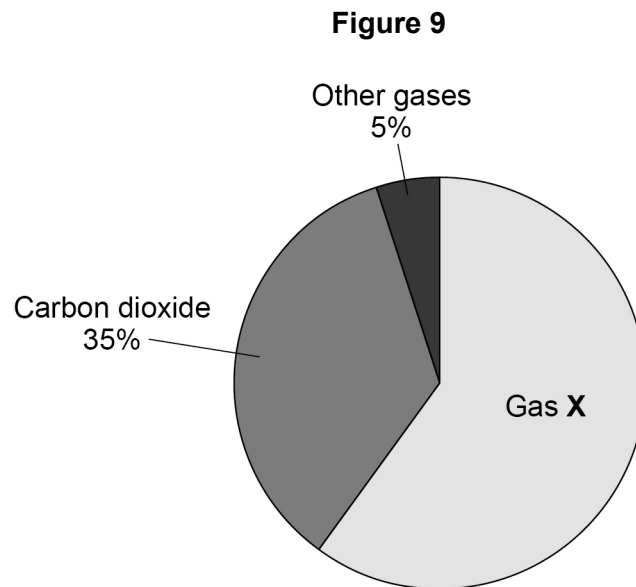
**[1 mark]**

_____

_____

**Question 4 continues on the next page**

**Turn over ►**

Dead plant material can also be decayed in a biogas generator.

**Figure 9** shows the percentages of the gases found in a sample of biogas.

**Figure 9**

Other gases
5%

Carbon dioxide
35%

Gas **X**

| 0 | 4 |.| 4 | Gas **X** is the main fuel gas found in the biogas.

What is gas **X**?

**[1 mark]**

Tick (✓) **one** box.

Carbon monoxide ☐

Hydrogen ☐

Methane ☐

Nitrogen ☐

| 0 | 4 | . | 5 | What is the percentage of gas **X** in the biogas?

[1 mark]

Percentage = _____ %

| 0 | 4 | . | 6 | The dead plant material in the compost heap and biogas generator does **not** decay completely.

Explain why a farmer might spread the remaining dead plant material onto his fields.

[2 marks]

_____

_____

_____

_____

_____

_____

**10**

**Turn over for the next question**

**Turn over ▶**

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| **04.1** | bacteria | | 1 | AO1 4.7.2.3 |
| | fungi | | 1 | |
| **04.2** | both increase rate | | 1 | AO1 4.2.2.1 |
| | because oxygen is needed for (aerobic) respiration **or** oxygen is used to release energy | do **not** accept anaerobic ignore energy produced | 1 | 4.4.2.1 4.5.1 4.7.2.3 4.7.4.1 |
| | as increased temperature causes faster reactions | allow named example eg respiration allow increased rate of enzyme action | 1 | |
| **04.3** | water | allow $H_2O$ / H₂O / moisture / rain do **not** accept $H^2O$ / H2O | 1 | AO1 4.7.2.3 |
| **04.4** | methane | | 1 | AO1 4.7.2.3 |
| **04.5** | 60 | allow sixty | 1 | AO2 4.7.2.3 |
| **04.6** | so plants / crops grow faster / better | | 1 | AO1 4.7.2.3 |
| | (decays further and) releases / contains mineral ions / named example | allow releases / contains nutrients ignore nitrogen / food / carbon dioxide allow as a fertiliser allow retains water in soil allow improves drainage allow insulates / keeps warm allow suppresses weed growth allow improves soil structure | 1 | |
| **Total** | | | **10** | |