

Answer 1a

a) A comparison of aerobic and anaerobic respiration:

At least **one** from:

Similarities

- ATP is released; [1 mark]
- The process of glycolysis occurs; [1 mark]
- Glucose is a reactant; [1 mark]
- They are catabolic reactions **OR** exothermic reactions; [1 mark]

Any **four** of the following:

Differences

- Aerobic respiration requires oxygen **WHEREAS** anaerobic respiration takes place in the absence of oxygen; [1 mark]
- In animals, aerobic respiration produces carbon dioxide and water **WHEREAS** anaerobic respiration produces lactate/lactic acid; [1 mark]
- In plants and yeast, aerobic respiration produces carbon dioxide and water **WHEREAS** anaerobic respiration produces ethanol and carbon dioxide; [1 mark]
- Aerobic respiration produces a lot/more/36 ATP **WHEREAS** anaerobic respiration produces little/less/2 ATP; [1 mark]
- Aerobic respiration takes place in the cytoplasm and mitochondria **WHEREAS** anaerobic respiration takes place in the cytoplasm only; [1 mark]

[Total: 5 marks]

Answer 1b

b) Waterlogged conditions may negatively impact crops as...

- Oxygen and carbon dioxide are less readily available in water **OR** oxygen and carbon dioxide diffuse more slowly in liquid compared to air; [1 mark]
- Plant roots don't get the oxygen they need for aerobic respiration; [1 mark]
- Plant leaves don't get the carbon dioxide they need for photosynthesis; [1 mark]

[Total: 3 marks]

Answer 1c

c) Adaptation present in Fig.1:

- Aerenchyma tissue; [1 mark]

This specialised plant tissue aids aerobic respiration in flooded fields because...

- It contains useful air spaces that allow gases that enter the stomata to diffuse to other parts of the plant; [1 mark]
- That are below water/submerged; [1 mark]

[Total: 3 marks]

Answer 1d

d) i) How rice plants are adapted to maximise anaerobic respiration:

- Toxic ethanol is produced during anaerobic respiration in plants; [1 mark]
- Rice plants can tolerate higher levels of ethanol compared to other plants **OR** rice plants produce more ethanol dehydrogenase / of the enzyme that breaks down ethanol; [1 mark]

d) ii) The benefits of growing rice plants in paddies:

- The other plants or weeds that would usually be competitors for nutrients and light are unable to survive in these conditions **SO** rice has more resources for its growth; [1 mark]
- Growing rice in these conditions increases the yield for farmers; [1 mark]

[Total: 4 marks]