Photosynthesis (H)

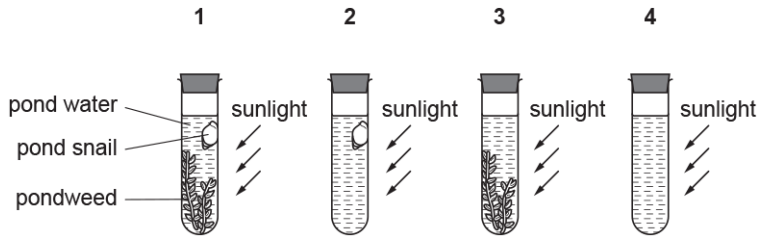
1. Aerobic respiration occurs all the time in plant cells but photosynthesis only occurs in daylight.

Why is more energy released by a plant cell during the night?

A Photosynthesis is endothermic taking in energy and aerobic respiration is exothermic.
B Photosynthesis is exothermic taking in energy and aerobic respiration is endothermic.
C Aerobic respiration is exothermic taking in energy and photosynthesis is endothermic.
D Aerobic respiration is endothermic taking in energy and photosynthesis is exothermic.

Your answer ☐ **[1]**

2. Pond snails and pondweed are living in water in sealed test tubes.



Carbon dioxide dissolves in water and forms an acid.

In which test tube would the water become most acidic?

A 1
B 2
C 3
D 4

Your answer ☐ **[1]**

3. A light source is placed 0.5 m from a plant. The relative light intensity falling on the plant is 2 units.

The light source is moved to 1 m away.

What is the relative light intensity falling on the plant now?

A 0.125
B 0.25
C 0.5
D 1.0

Your answer ☐ **[1]**

4. Scientists investigated if crops could be grown on the planet Mars.

They used a soil that was similar to the soil found on Mars. The soil contained some minerals but no living organisms.

i. The scientists managed to grow crops in the soil. However on Mars, the minerals in the soil would soon run out.

Explain why.

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[2]

ii. Living organisms could be added to the soil but there is no air on Mars. The plants would need to be grown in an enclosed structure.

At first, air would need to be added, but after a while the organisms in the soil and the plants would supply each other with the gases they need.

Explain how this would happen.

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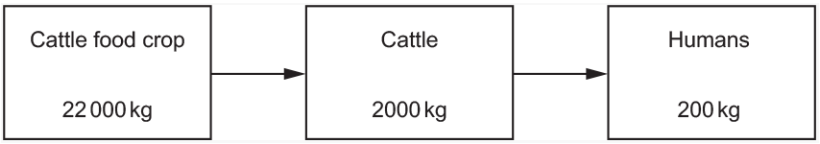
[2]

5. The diagram shows the flow of biomass through an agricultural food chain.



High levels of light intensity can damage plants. To prevent damage, plants have a protection mechanism.

When light intensity levels get **too high**, the protection mechanism switches on. This stops the plant absorbing too much light.

When the light intensity drops to safe levels, the protection mechanism switches off **slowly**.

Explain why this mechanism would **reduce** the biomass available to humans.

[6]

6. A student investigates the plants growing underneath a tree.

He lays out a tape measure on the ground, starting at the tree. He then places a quadrat on the ground.

He measures the percentage of the ground in the quadrat that is covered by plants. He repeats this every metre away from the tree.

The table shows his results.

Distance from the tree (m)	Percentage of ground covered by plants (%)
1	10
2	15
3	18
4	22
5	50
6	58
7	62
8	64

The student thinks that shade from the tree is affecting the plants.

Explain how the student's results show this.

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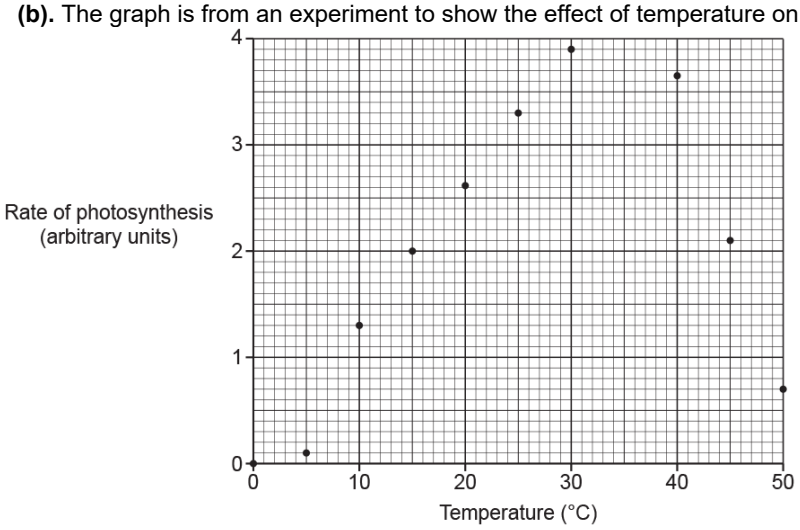
[4]

7 (a).

Photosynthesis involves reactions that are endothermic.
What is meant by the term endothermic reaction?

_____ **[1]**

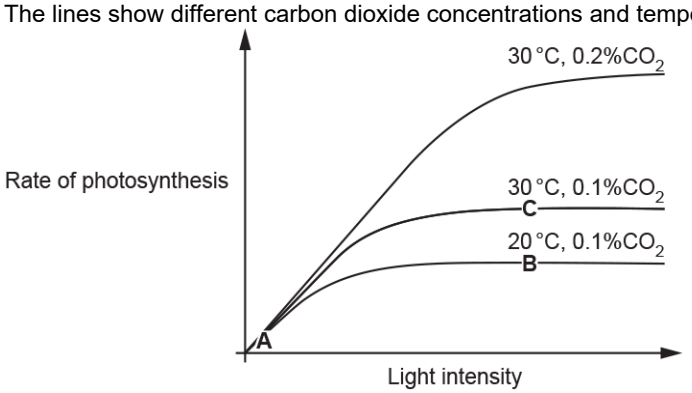
(b). The graph is from an experiment to show the effect of temperature on the rate of photosynthesis.



Draw a line of best fit. **[1]**

(c). Look at the graph. It shows how light intensity affects the rate of photosynthesis.

The lines show different carbon dioxide concentrations and temperatures.



Explain what is limiting the rate of photosynthesis at the three points **A, B** and **C** on the graph.

Use evidence from the graph in your answer.

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_____ **[3]**

END OF QUESTION PAPER