Higher Combined version — Higher Tier (★) included; Separate-only (◆) removed.

Q1. Explain how the structure of a leaf is adapted for efficient photosynthesis.

[4 marks]

Q2. State the three limiting factors of photosynthesis. Explain what happens when a plateau is reached on a graph of rate vs light intensity.

[3 marks]

Q3. Describe how a student could set up a fair test to investigate the effect of light intensity on photosynthesis using pondweed.

[3 marks]

Total: 10 marks

Q1 (4 marks)

Explain how the structure of a leaf is adapted for efficient photosynthesis.

- Palisade cells: near top, many chloroplasts, close to light [1]
- Transparent epidermis — lets light through to palisade cells [1]
- Spongy mesophyll: air spaces for CO■ diffusion [1]
- Stomata: allow gas exchange; xylem supplies water; phloem removes sugars [1]

Q2 (3 marks)

State the three limiting factors of photosynthesis. Explain what happens when a plateau is…

- Limiting factors: light intensity, CO■ concentration, temperature [1]
- Plateau: increasing light has no further effect [1]
- Because another factor is now limiting — CO■ or temperature [1]

Q3 (3 marks)

Describe how a student could set up a fair test to investigate the effect of light intensi…

- Use pondweed; count O■ bubbles at different distances from lamp [1]
- Control: temperature (water bath), CO■ (add NaHCO■) [1]
- Three repeats at each distance; calculate mean [1]