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

Q1. Describe the differences between xylem and phloem in terms of structure and function.

[4 marks]

Q2. Explain how root hair cells are adapted for their function.

[3 marks]

★ HIGHER TIER

Q3. ★ Explain the transpiration stream and the forces that drive water movement through the plant.

[3 marks]

Total: 10 marks

Tissues and Transport

Q1 (4 marks)

Describe the differences between xylem and phloem in terms of structure and function.

- Xylem: dead hollow cells, lignified walls — structural support and water transport [1]
- Xylem: carries water and mineral ions from roots upward only (transpiration stream) [1]
- Phloem: living cells with sieve plates [1]
- Phloem: carries dissolved sugars (sucrose) from leaves to all parts of plant (translocation) — both directions [1]

Q2 (3 marks)

Explain how root hair cells are adapted for their function.

- Long extension greatly increases surface area [1]
- Water absorbed by osmosis (soil water potential > root cell water potential) [1]
- Mineral ions absorbed by active transport (requires ATP from mitochondria) [1]

Q3 (3 marks) [★ HT]

★ Explain the transpiration stream and the forces that drive water movement through the pl…

- Water evaporates from leaf cells through stomata (transpiration) [1]
- Creates negative pressure at the top of the xylem — pulls water column upward [1]
- Cohesion of water molecules (hydrogen bonding) maintains continuous column from roots to leaves [1]