Foundation Separate version — Higher Tier (★) questions 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]

◆ SEPARATE SCIENCE

Q3. ◆ Explain how the structure of a leaf cross-section is adapted for photosynthesis.

[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) [◆ Sep]

◆ *Explain how the structure of a leaf cross-section is adapted for photosynthesis.*

- Palisade cells: near top, packed with chloroplasts, close to light source [1]
- Spongy mesophyll: air spaces allow CO■ to diffuse to palisade cells [1]
- Stomata in lower epidermis: control gas exchange (CO■ in, O■ and water vapour out) [1]