AQA, OCR, Edexcel

A Level

A Level Biology

Mass Transport in Plants
Answers

Name:

M M E

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Total Marks: /40

Answer	Marks
1. a) i) – increases surface area - faster water uptake	2 marks
ii) – Water moves from an area of high water potential to an area of low water potential -High water potential in the soil -Low water potential in the leaves - Permanent gradient	3 marks
b) i) Symplastic pathway - water moves through living parts of the cell -Through the cytoplasm -Passes through plasmodesmata between cells	4 marks
ii) Apoplastic pathway - Non-living cells, through the cell walls -Water can diffuse straight though to the next cell	3 marks
iii) Apoplastic – least resistance	2 marks
2. a) i) Osmosis would be too slow	1 mark
ii) – uninterrupted tube - Made up of dead cells – no cytoplasm/ organelles -Thick walls, lined with **lignin** for structure and waterproofing.	3 marks
b) i) Water is being moved against the force of gravity	1 mark
ii) Evaporation of water in the leaves	1 mark

iii) – water molecules stick together - transpirational pull forms a continuous column of water through the plant - water column moves is pulled up towards the leaf	3 marks
c) i) – stomata opens so carbon dioxide can enter -water is lost from the stomata because the water potential is higher inside the leaf than outside	2 marks
ii) –higher temperature means the water molecules have more kinetic energy - faster rate of evaporation	2 marks
d) i) Prevents air from entering the closed system	1 mark
ii) – the starting position of the bubble is recorded -the distance the bubble moves over certain amount of time is measured -conditions are changed and the rate of movement of the air bubble is compared	3 marks
iii) <u>Any two from:</u> -Light -Humidity -Wind	2 marks
3. a) i) – living cells - 'sieves' form the end walls of the tube - perforated end walls, aids movement through the phloem. - no nucleus and few organelles	3 marks

ii) – companion cells have all the organelles to support the sieve tube cells - they provide ATP for active transport in the sieve cells.	2 marks
b) i) Source – where the substance (sucrose) is transported into the phloem Sink – where substances (sucrose) is transported by the phloem and used in the plant	2 marks