

**AS Module 1 Cell physiology test - mark scheme**

**1**

Mechanism	Feature		
	Along concentration gradient	Involvement of membrane carrier	Energy used
Active transport	X	✓	✓
Diffusion	✓	X	X
Facilitated diffusion	✓	✓	X

**[1] for each row**

[3]

**2 (a) -0.8 MPa;**

[1]

**(b) B to C;  
B to A and A to C;**

[2]

**(c) Water moves from high to low water potential;**

[1]

**(d) The water potential would decrease;  
since the solute potential would become more negative;**

[2]

**3 (a)  $\psi_{\text{cell}} = -1350 + 400 = -950 \text{ kPa}$ ;**

[1]

**(b) Arrow from the cell into the solution;  
since water moves from high to lower water potential/the cell has a  
higher water potential than the solution;**

[2]

**(c) (i) Starch is insoluble;**

**(ii) Water potential of the cell is not as negative/will not draw water  
from other non-starch storing cells in the plant;**

[2]

**4 (a) Any three from**

- more glucose is absorbed by living intestinal cells than arabinose
- similar amounts of glucose and arabinose are absorbed by cyanide-treated cells
- treatment with cyanide causes a (significant) reduction in the rate of absorption of glucose
- similar treatment with cyanide does not affect the rate of arabinose absorption

[3]

**(b) Arabinose;**

as the rate remains the same in the intestinal cells treated with cyanide;

suggesting that ATP/respiration is not needed for arabinose absorption/it is a passive process [*NOT energy for ATP*];

[3]

**(c) Glycogen;**

**Any three from**

- contains  $\alpha$ -glucose molecules
- joined by condensation reactions/glycosidic bonds
- both 1–4 and 1–6 bonds are present
- 1–4 bonds create the straight chains/1–6 bonds create branching

[4]

**(d) Any two from**

- an enzyme inhibitor that bears no resemblance to the enzyme's natural substrate/may attach to a part of the enzyme other than the active site/doesn't compete with substrate for the active site
- alters the shape of the active site/permanently binds to (blocks) the active site
- inhibition does not depend on the relative concentration of the inhibitor

[2]