

Answers to examination-style questions

Answers	Marks	Examiner's tips
1 (a) (i) many filaments/lamellae; so large surface area; large numbers of capillaries; maintains a diffusion gradient/removes oxygen; thin epithelium/lamellae wall; short diffusion pathway;	2 max	To gain both marks your explanation must relate directly to the feature you have described. You will not gain full marks for describing two features without an explanation. Simply stating 'a good blood supply' will not gain a mark!
(ii) maintains diffusion/concentration gradient/equilibrium not reached; diffusion occurs across whole length of lamellae/gill;	2	This requires understanding of the countercurrent system.
(b) less energy needed/continuous flow of water or O ₂ ;	1	
(c) (i) larger surface area for gaseous exchange;	1	References to 'more space' for gaseous exchange is not sufficient for a mark.
(ii) lowers water potential of tissues; liquid moves in by osmosis;	2	
(iii) diffusion pathway is too long/related to surface area to volume ratio; to supply enough oxygen;	2	
2 (a) glucose/oxygen/amino acids/fatty acids glycerol/salts;	1	Two substances must be named for one mark.
(b) proteins (in blood); lower water potential/becomes more negative; reabsorption of water by osmosis; via lymph system/lymph vessels;	3 max	A full answer should include the return of tissue fluid directly into the blood and also via the lymph system.
(c) (i) high blood pressure increases rate of filtration/forces more fluid out; lymph system cannot cope/higher pressure reduces reabsorption;	2	
(ii) gravity/fewer lymph vessels;	1	This explains why individuals with swollen ankles are told to keep their feet elevated to reduce the swelling.
3 (a) A = xylem; B = endodermis;	2	

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(b) (i) cell walls;	1	
(ii) from higher water potential in soil to lower water potential in root; via osmosis;	2	Alternatively for the first mark point you could say 'from a less negative to a more negative water potential'.
4 (a) (i) involves active transport; secretion/movement of salts into xylem; reference to role of endodermis; water moves along water potential gradient;	3 max	
(ii) solar energy source; evaporation of water; water potential gradient created across leaf/mesophyll cells; tension created in xylem/water column; cohesion of water molecules maintains column; due to H-bonding/polarity/charges of water molecules; adhesive force between water and wall;	5 max	Cohesion is the attractive force between similar molecules – in this instance water. Adhesion between the water and the xylem wall also maintains the column.
(b) (<i>feature and explanation required for mark</i>) rolled leaves – reduce water potential gradient/air movement across stomata/trap <u>air</u> which becomes saturated/moist/humid/reduce surface area; sunken stomata – reduce water potential gradient/air movement across stomata/trap <u>air</u> which becomes saturated/moist/humid; thick cuticle – reduces cuticular transpiration/reduces evaporation/greater diffusion distance; hairs – trap <u>air</u> which becomes saturated/moist/humid; reduced leaves/spines – less surface area/fewer stomata (for evaporation)	3 max	Three features without a suitable explanation = 1 mark Do not refer to water being 'trapped'. You should refer to water vapour or air containing water molecules.
5 (a) (i) vena cava;	1	
(ii) pulmonary artery;	1	The only artery to carry deoxygenated blood.
(b) (i) supplies heart (tissues) with oxygen/glucose;	1	
(ii) aorta;	1	

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(c) artery – thickest wall, enabling it to carry blood at high pressure/withstand pressure surges; most elastic tissue, which smoothes out flow/maintains pressure; muscle in wall to control blood flow; vein – thin wall does not have to withstand high pressure; capillary – thin wall, allowing diffusion/exchange; only endothelium present, allowing short diffusion pathway; all vessels – have endothelium that reduces friction;	6 max	You have to state clearly which type of blood vessel you are referring to when relating structure to function.