OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



MARK SCHEME

B5.1 HOW DO SUBSTANCES GET INTO, OUT OF AND AROUND OUR BODIES? (HIGHER)

SCORE	PERCENTAGE
/36	%

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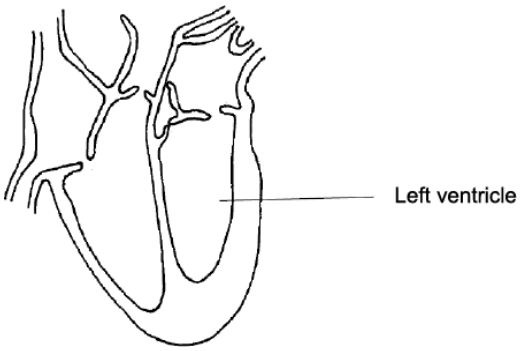
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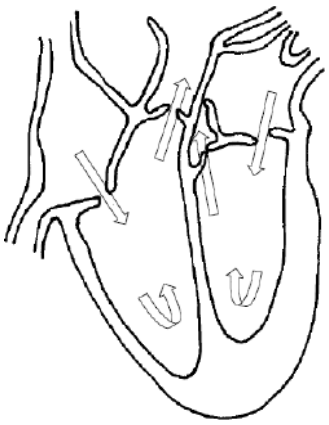
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Question			Answer/Indicative content	Marks	Guidance
1		i	Transports oxygen ✓	1	ALLOW carries oxygen / carries carbon dioxide / transports carbon dioxide
		ii	Any three from 1. Sarah has fewer red blood cells than normal ✓ 2. Less oxygen transported ✓ 3. So less ATP produced ✓ 4. As less respiration ✓	3	MP3 DO NOT ALLOW less energy produced
		iii	136 / 90 = 1.5 : 1 ✓	1	
		iv	Increases rate of diffusion of oxygen into cell ✓	1	
		v	A (chemical) messenger ✓	1	
			Total	7	
2		i	✓ C	1	
		ii	Blood vessel X – vein ✓ Blood vessel Y – artery ✓ Blood vessel Z – capillary ✓	3 2	
			Total	0	
3	a		Any two fromSupply sugar / oxygen ✓Thick walls of heart do not otherwise getenough sugar / oxygen ✓By di		
	b	i	Greater pressure generated (by thicker muscle) ✓ To push blood further (round the body) ✓	2	
		ii	Label pointing to left ventricle on diagram ✓		
				1	

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Question			Answer/Indicative content	Marks	Guidance
		iii	Arrows as shown below ✓ ✓ 	2	1 mark for correct on each side
			Total	0	

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Question			Answer/Indicative content	Marks	Guidance
4	a		White blood cells fight infection / fight microbes / produce antibodies; Platelets clot blood; Plasma transports or carries (substances / cells);	3	Examiner' Comments Although this question was answered well by most candidates, a significant number failed to score all three marks. Credit was not given for simply naming the parts. Good answers stated that white blood cells fought infection, platelets clot blood and plasma transported nutrients around the body. Answers that referred to red blood cells did not score.
	b		No nucleus; Concave / bi concave / large surface area;	2	Examiner' Comments This question was surprisingly well answered and most candidates were not put off by the context. Many candidates scored both marks for realising that a lack of a nucleus provided extra space for haemoglobin and the shape gave a large surface area for the absorption of oxygen.
			Total	0	

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Question			Answer/Indicative content	Marks	Guidance
5			[Level 3] Answer includes point or points from 3 areas. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) [Level 2] Answer includes point or points from 2 areas. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) [Level 1] Answer includes point or points from 1 area. Quality of written communication impedes communication of the science at this level. (1 – 2 marks) [Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	• air bubbles form (in blood) **when surfacing** **Problems may include:** • pain • bends • dizziness • could prevent blood flow / death **Predictions may include:** **Prevention points may include:** • need to come up slowly • dive for less time • not go as deep **Use the L1, L2, L3 annotations in Scoris; do not use ticks.** **Examiner's Comments** This was the third of the level of response questions and was overlap with the foundation tier. It was targeted at candidates up to grade C. As expected for higher tier candidates, this question was answered well by most candidates. Examiners were looking for three specific areas in candidates answers. Credit was given for predicting what would happen to Helene as she rose to the surface, what problems this would cause her and finally how these problems could be prevented. **This question is targeted at grades up to C**
			Total	6	

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Question			Answer/Indicative content	Marks	Guidance
6		i	0.79 (2) 0.5 x 0.5 x 3.14 (1)	2	two marks for correct answer **0.785 1 mark maximum** if answer is incorrect, accept correct working for one mark must specify 3.14 in working out Examiner's Comments This was a well answered question. Where candidates did not get the marks, they had not given the answer to the required number of decimal places.
		ii	A / artery needs thick muscle / wall to withstand high pressure (1) B / vein only need thin muscle / wall to carry low pressure of blood (1)	2	Artery with thick**er** muscle walls to withstand high**er** pressure = 2 marks ORA for veins Examiner's Comments This was a challenging question. Candidates had to describe the relationship between the wall thickness of the blood vessel and pressure in the correct context to gain the marks.
			Total	0	
7			A – (low white blood cell count), likely to get infection / disease / weak immune system (1) B – (low haemoglobin so) anaemic / get tired easily / less oxygen / breathless (1) C – (low platelets so) blood not clot as quickly / bleed for longer (1)	3	**ignore** illness **ignore** pale **ignore** scabs / wounds not healing Examiner's Comments This question discriminated well and stronger candidates scored all three marks on this question. Regarding A, credit was not given for reference to illness and to score candidates had to refer to disease, infection, or the immune system. In C credit was not given for reference to scabs or wounds not healing.
			Total	0	

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