OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



MARK SCHEME

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

SCORE	PERCENTAGE
/38	%

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Question			Answer/Indicative content	Marks	Guidance
1	a		Acts as a pump ✓	1	
	b		Kidneys ✓	1	If more than one box is ticked, do not award the mark even if the correct box is also ticked
	c		They can specialise into other cells ✓ Could be used to treat disease ✓	2	
			Total	3	
2	a	i	Correctly labelled vena cava / pulmonary artery ✓	1	
		ii	Coronary artery ✓	1	
	b	i	A / C ✓	1	Mark first answer on the line A second letter given which is incorrect = 0 marks
		ii	B / D ✓	1	Mark first answer on the line A second letter given which is incorrect = 0 marks

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Question			Answer/Indicative content	Marks	Guidance
	c		Please refer to the marking instructions for guidance on how to mark this question. **Level 3 (5–6 marks)** *Explains the function of three vessels and relates this to their structure using evidence from the diagrams* ***AND*** *Draws a conclusion from the data in support of the functions.* *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated* **Level 2 (3–4 marks)** *Explains the function of two vessels and relates this to their structure using evidence from the diagrams* ***AND*** *Makes reference to the data.* *There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.* **Level 1 (1–2 marks)** *Explains the function of one vessel and relates this to its structure using evidence from the diagram.* *The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.* **0 marks** *No response or no response worthy of credit.*	6	**AO1.1 Description of structure related tofunction**Fo • Blood carried away from the heart • Under high pressure • Thick outer walls • Thick layer of muscle • Thick layer of elastic fibres **Veins:** • Carry blood back to the heart • Under lower pressure than arteries • Thin walls • Thin layer of muscle • Thin layer of elastic fibres • Valves to ensure one way flow of blood **Capillaries:** • Exchange materials / oxygen / carbon dioxide • Thin walls • One cell thick • Thin lumen brings red blood cells close to body cells **AO3.2b Analyse the data in the table and** **draw a conclusion** For example: • Veins more stretchy than arteries **Data**• Arteries have more recoil than veins • Quote of data
			Total	**0**	

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Question			Answer/Indicative content	Marks	Guidance
3			[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 • damage to tissues • 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 extended writing question had a wide spread of marks. Many candidates were able to take the information from both areas and produce a response that answered the question, namely ‘prediction and explanation’. This question is targeted at grades up to C
			Total	6	

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Question			Answer/Indicative content	Marks	Guidance
4	a		(Increase volume for) more haemoglobin / (carry) more oxygen;	1	Needs idea of more / increased amount Ignore increased surface area **Examiner's Comments** The idea that red blood cells do not have a nucleus to allow for more haemoglobin or to allow more oxygen to be carried was very poorly understood.
	b		Stops blood / haemoglobin absorbing oxygen; Oxygen not supplied to cells / tissues / organs; Cells / tissues / organs die / cannot respire;	3	Ignore body **Examiner's Comments** The problems associated with carbon monoxide was very poorly understood, very few candidates gaining many marks here.
			Total	**0**	

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Question			Answer/Indicative content	Marks	Guidance
5		i	*Fred is correct* *any two from*: A / artery has thicker muscle or B / Vein has thinner muscle (1) A / artery has a thicker wall or B / Vein has thinner wall (1) A / Artery has smaller lumen or B / vein has larger lumen (1)	2	if candidate indicates Fred is incorrect = 0 credit comparative responses e.g artery wall is thick, vein wall is thin ignore hole / space Examiner's Comments In this question candidates were asked to describe the evidence from the diagram that a blood vessel was an artery. Many candidates performed well on this question, with over half gaining one or both marks. Candidates that did not score well lost marks due to the statements not being comparative. Some merely stated that Fred was correct as 'arteries have a thick outer wall' for example. Some candidates scored 0 for this question as they incorrectly claimed that Fred was incorrect and that Vessel A was a vein.
		ii	valves	1	Examiner's Comments Candidates found this question very difficult. A small percentage of candidates identified valves as the feature. A common incorrect answer was blood.
			Total	**0**	

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Question			Answer/Indicative content	Marks	Guidance
6	a		vena cava aorta ventricle auricle / atrium	2	4 correct = 2 marks 2 or 3 correct = 1 mark **Examiner's Comments** Many candidates struggled with the correct names for the blood vessels and the chambers.
	b		lungs → rest of body ←	1	both boxes correct for mark **Examiner's Comments** Disappointingly only half the candidates were aware of the direction of blood flow around the body. Candidates were instructed to place two arrows on the diagram, many also placed other contradictory ones at various points.
	c		valve (1) stops back flow of blood / blood flows in one direction (1)	2	**accept** (stops blood) backtracking / wrong direction **Examiner's Comments** Candidates responses here showed a clear attempt to engage with the question. Many knew that the structure was a valve and what its function was; many other candidates gained one mark either for the name or its function.
			Total	0	

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Question			Answer/Indicative content	Marks	Guidance
7			Level 3 (5–6 marks) Includes some basic and some higher components with an explanation of what they do. Quality of written communication does not impede communication of science at this level. Level 2 (3–4 marks) Include some structural components with an explanation of what they do. Quality of written communication partly impedes communication of science at this level. Level 1 (1–2 marks) Include some basic structural component(s) OR one component explained Quality of written communication impedes communication of science at this level. Level 0 Insufficient or irrelevant science. Answer not worthy of credit.	6	This question is targeted at grades up to G Indicative scientific points may include: *Specific* Higher • hormones – chemical messengers • glucose – for respiration • carbon dioxide – from respiration • urea – waste • plasma (explained) carries substances Basic • red blood cells – haemoglobin – transport oxygen • white blood cells – destroy micro-organisms • platelets – clot blood • plasma (identified) – liquid part of blood *General* • Level 2 and 3 should include an explanation of what the components do. Use the L1, L2, L3 annotations in Scoris; do not use ticks. Examiner's Comments This six-mark extended-writing question differentiated well with many candidates showing that they had learned the basic structures associated with blood. However a number of candidates were confused with the functions of the red and white blood cells.
			Total	0	

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