

Mark scheme

Question			Answer/Indicative content	Marks	Guidance
1			Photosynthesis ✓	4 (4 x AO 1.1)	<u>Examiner's Comments</u> The majority of candidates managed to gain either 1, 2 or 3 marks on this question. Answer line four appeared to be the most challenging, with a lot of candidates incorrectly selecting 'leaf'.
			Chlorophyll ✓		
			Sunlight ✓		
			Phloem ✓		
			Total	4	
2	a		(Valves) stop the backflow of blood/ensure blood flows in one direction ✓	1 (AO 1.1)	<u>Examiner's Comments</u> Many candidates did not know that valves stop the backflow of blood. The most common incorrect response stated that valves keep blood moving without qualifying it.
					 Assessment for learning A knowledge gap has been identified in candidates' ability to define the role of valves. The candidates would benefit from revisiting this key knowledge throughout the GCSE course and make sure it is clearly embedded in schemes of work.
	b		Blood/pressure builds up (in the legs) ✓	1 (AO 2.1)	ALLOW reduces blood flow (away from legs) ALLOW blood flow backwards IGNORE vein swells up <u>Examiner's Comments</u> Many candidates found this question challenging to apply their knowledge. Most candidates rewrote the question or gave responses such as stops blood moving around the body.

c	i	First check the answer on the answer line If answer = 578 or 577.76 award 2 marks $\frac{(1256 \times 46)}{100} \checkmark$ = 578 / 577.76 ✓	2 (2 x AO 2.2)	ALLOW 577 / 577.8 for one mark <u>Examiner’s Comments</u> This question discriminated between students at different grades well and many candidates were able to identify that they needed to calculate 46% of 1256 people with varicose veins. Those who were given one mark incorrectly rounded down instead of up.															
	ii	<table><thead><tr><th>Conclusion</th><th>True</th><th>False</th></tr></thead><tbody><tr><td>More females than males develop varicose veins.</td><td>✓</td><td></td></tr><tr><td>Varicose veins are more common in people under the age of 25.</td><td></td><td>✓</td></tr><tr><td>The age range 50–54 has the greatest number of cases of varicose veins.</td><td></td><td>✓</td></tr><tr><td>There are more than double the number of people with varicose veins in the age range 55–59 compared to 65–69.</td><td>✓</td><td></td></tr></tbody></table> ✓✓	Conclusion	True	False	More females than males develop varicose veins.	✓		Varicose veins are more common in people under the age of 25.		✓	The age range 50–54 has the greatest number of cases of varicose veins.		✓	There are more than double the number of people with varicose veins in the age range 55–59 compared to 65–69.	✓		2 (2 x AO 3.2b)	All correct = 2 marks Two or three correct = 1 mark One correct = 0 marks DO NOT ALLOW more than 1 tick for each row. <u>Examiner’s Comments</u> The vast majority of candidates were given at least one mark here in drawing conclusions from the data. More candidates gained full marks by correctly identifying if the four conclusions were true or false.
Conclusion	True	False																	
More females than males develop varicose veins.	✓																		
Varicose veins are more common in people under the age of 25.		✓																	
The age range 50–54 has the greatest number of cases of varicose veins.		✓																	
There are more than double the number of people with varicose veins in the age range 55–59 compared to 65–69.	✓																		
d		Any one from: (To see if other scientists) can replicate/reproduce/further develop the work ✓ To check/prove the method/data/results/mistakes ✓ To uphold standards / prevent unethical practice/bias ✓ Recognition of work ✓	1 (AO 2.1)	ALLOW comment/feedback on work/identify mistakes/misinformation IGNORE share views DO NOT ALLOW accurate results/anomalies ALLOW can see the value of the research <u>Examiner’s Comments</u> This question asks the candidates to															

					understand the importance of peer review, which comes under the working scientifically WS1.1i part of the specification. Many candidates were able to achieve this mark. Centres should make sure that candidates are familiar with peer review when carrying out PAG activities and in schemes of work.
			Total	7	
3	a		Idea oxygen to reach the chick / carbon dioxide produced by the chick to escape ✓	1 (AO 2.1)	ALLOW chick can respire IGNORE gases in and out / breathing <u>Examiner's Comments</u> Many candidates gained this mark for correctly identifying the need for oxygen to reach the developing chick or removing carbon dioxide. Some candidates just repeated the stem of the question or spoke about the egg exploding from the build-up of gases.
	b		2 (orders of magnitude) ✓	1 (AO 2.2)	<u>Examiner's Comments</u> This was the lowest scoring question on the paper. Candidates did not know how to calculate the order of magnitude. The most common mistake was dividing the size of the hen's egg by the size of the bee's egg and reaching a response of 100.  Assessment for learning Knowledge gap identified in candidates' ability to calculate order of magnitude. The candidates would benefit from revisiting this key knowledge throughout the GCSE course and make sure it is clearly embedded in schemes of work. The OCR specification mathematical

					requirements M2h and Working Scientifically WS1.4d clearly states that candidates need to be able to make order of magnitude calculations.  OCR support The <u>Mathematical Skills Handbook</u> can be used to support the teaching of skills such as Order of Magnitude calculations. It can also be shared with students to support their own learning and revision.
			Total	2	
4			D	1 (AO 1.1)	
			Total	1	
5			D	1 (AO 1.1)	<u>Examiner's Comments</u> The majority of candidates could identify that oxygen is carried by red blood cells.
			Total	1	
6			C	1 (AO 1.1)	<u>Examiner's Comments</u> Less than half of candidates could correctly identify the pulmonary vein transports blood from the lungs to the heart.  Assessment for learning Candidates could benefit revisiting blood vessels and the circulatory system more than once throughout the GCSE course to improve their recall of key knowledge.
			Total	1	
7			Oxygen ✓ Haemoglobin ✓	4 (4 x 1.1)	

			Lactic ✓ Natural selection ✓		IGNORE evolution <u>Examiner's Comments</u> More successful responses saw candidates gain 3 or 4 marks on this question. Where a mark was dropped it was for the last response, where candidates confused the processes of natural selection, selective breeding and genetic engineering. Where only 1 or 2 marks were gained, it tended to be for response 1 (oxygen) and response 3 (lactic).
			Total	4	
8		i	Medulla ✓	1 (AO 2.1)	
		ii	Cortex ✓	1 (AO 2.1)	<u>Examiner's Comments</u> This was one of the most challenging questions on the paper. Very few candidates could correctly identify region A as the medulla and B as the cortex. The majority of incorrect responses stated the nephron/tubules or stated random blood vessels. A large number of candidates did not attempt this question and were awarded a 'no response' which was not representative for the paper as a whole.  Assessment for learning Knowledge gap identified in the application of knowledge and understanding of the structure of the kidney. Candidates would benefit with the reinforcement of the kidney structure to increase their knowledge and understanding.
		iii	Artery ✓	1 (AO 2.2)	DO NOT ALLOW more than one answer circled <u>Examiner's Comments</u>

					Roughly half of candidates could correctly identify the artery brings blood to the kidney.
			Total	3	
9			D	1 (AO 2.1)	
			Total	1	
10			C	1 (AO 1.1)	
			Total	1	
11			D	1 (AO 1.1)	<u>Examiner's Comments</u> The candidates were challenged by this question, demonstrating a seeming lack of understanding of the chambers of the heart and contraction. Candidates incorrectly identified the right ventricle just as much as choosing the left atrium.
			Total	1	
12			D	1 (AO 1.1)	
			Total	1	
13			D	1 (AO 1.1)	
			Total	1	
14			B	1 (AO 2.1)	
			Total	1	
15			Fat ✓ Oxygen ✓ Attack ✓	3 (AO 1.1)	<u>Examiner's Comments</u> This question testing knowledge and understanding was one of the most assessable questions in section B. The majority of candidates achieved full marks here for correctly completing each sentence from the list of words about heart disease.
			Total	3	
16	a	i	Any valve correctly labelled ✓	1 (1 × AO 1.1)	<u>Examiner's Comments</u>

					The majority of candidates did not score this mark. Those who didn't gain the mark pointed to the blood vessels.
		ii	Either atrium correctly labelled ✓	1 (1 × AO 1.1)	<u>Examiner's Comments</u> The majority of candidates did not score this mark. Those who didn't gain the mark pointed to the ventricles or blood vessel.
		iii	Pumps blood to the body ✓ Needs a bigger pressure / blood has to travel further ✓	2 (1 × AO 1.1) (1 × AO 2.1)	Assume answer refers to left ventricle if not stated ALLOW right ventricle pumps blood to the lungs ALLOW stronger contraction/force ALLOW ORA about right ventricle throughout <u>Examiner's Comments</u> This was a well differentiated question. The more successful candidates gained at least one mark. The majority of less successful responses gave generalised answers such as 'it pumps blood'. The most common mark scored demonstrated their knowledge that the left ventricle pumped blood to the body.
	b		First check answer on answer line. If answer = 180 award 2 marks 3 × 60 ✓ = 180 ✓	2 (2 × AO 2.2)	<u>Examiner's Comments</u> The majority of candidates achieved full marks here for correctly calculating how many times the blood circulated around the body in one hour.
	c		Idea as the time spent exercising increases, the resting heart rate gets lower ✓	1 (1 × AO 3.2b)	ALLOW ORA for less hours of exercise increases the resting heart rate IGNORE healthier ALLOW higher levels answers with an alternative correct conclusion <u>Examiner's Comments</u> Over half of the candidates could correctly identify the trend from the graph. A small number of candidates described the trend the wrong way round.

	d	(Veins do not have) a narrow lumen ✓	1 (1 × AO 1.1)	ALLOW veins have a wide/large lumen Examiner's Comments More successful responses correctly identified that veins do not have a narrow lumen. The most common incorrect answer identified that veins did not have a smooth lining or carried blood back to the heart.
	e	Blood travels through pump/heart twice ✓ On full circuit around body ✓	2 (2 × AO 1.1)	ALLOW idea that there are two pumps / idea that blood is pumped twice ALLOW idea that blood passes separately to lungs and body/has systemic and pulmonary circuit ALLOW description for 2 marks - blood passes through the heart and goes to the lungs, returns to the heart, and then goes to the rest of the body. Examiner's Comments This question was challenging for the candidates. The majority could not explain the double circulatory system. Many candidates just referred to blood circulation and seemed to be unaware of the double circulatory system.
		Total	10	
17		<pre> graph TD A[sunlight is used to form sugars for the plant] --> B[photosynthesis] B --> C[xylem and stomata] C --> D[phloem] D --> E[chloroplasts] E --> F[translocation] F --> G[transpiration] G --> H[the method of moving sugars around the plant] H --> I[the loss of water from the aerial parts of a plant] </pre>	4 (4 × AO 1.1)	6 correct lines = 4 5/4 correct lines = 3 3 correct lines = 2 2 correct lines = 1 DO NOT ALLOW more than 1 line from each box Examiner's Comments The majority of candidates achieved 3 or maximum marks, correctly identifying the description and structures involved in photosynthesis, transpiration and translocation. This

					tested their AO1 knowledge and understanding.
			Total	4	
18			B ✓	1 (AO 2.1)	
			Total	1	
19			D ✓	1 (AO 1.1)	<u>Examiner's Comments</u> The candidates were challenged by this question, which demonstrated a lack of knowledge and understanding of key adaptations of blood vessels. Most answers which were not mark worthy answered C Capillaries instead of D Veins
			Total	1	