Mark scheme

<table>
<tr><th colspan="3">Question</th><th>Answer/Indicative content</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1</td><td></td><td></td><td>Lactic acid ✓</td><td>1
(AO 2.1)</td><td><u>Examiner's Comments</u>

The vast majority of candidates recognised that lactic acid caused pain in their leg muscles. The most common incorrect response was fatty acid.</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>1</td><td></td></tr>
<tr><td>2</td><td></td><td></td><td><table><tr><td>Reagent</td><td></td><td>Colour</td><td></td></tr><tr><td>Benedict's</td><td></td><td>Black</td><td></td></tr><tr><td>Biuret</td><td>✓</td><td>Purple</td><td>✓</td></tr><tr><td>Iodine</td><td></td><td>Red</td><td></td></tr></table>✓✓</td><td>2
(2 x AO 1.2)</td><td>DO NOT ALLOW more than one tick in each column

<u>Examiner's Comments</u>

This question required knowledge and understanding of food test reagents and positive results. This proved challenging for the candidates and several candidates did not score here.

Assessment for learning

Knowledge gap identified in candidates' understanding of food reagent tests and their qualitative colour results.

The candidates got confused, mixing up the wrong reagent with colour change. The candidates would benefit from revisiting this key knowledge throughout the GCSE course.</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>2</td><td></td></tr>
<tr><td>3</td><td></td><td></td><td>D</td><td>1
(AO 1.1)</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>1</td><td></td></tr>
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4			A**ny 4 from**: (Aerobic) respiration ✓ Glucose (used) ✓ Oxygen (used) ✓ Carbon dioxide and water (made) ✓ When oxygen levels are low ✓ Anaerobic respiration (can also produce ATP) ✓ (Anaerobic respiration) produces lactic acid ✓	4 (4 x AO 1.1)	**DO NOT ALLOW** aerobic respiration if lactic acid produced **DO NOT ALLOW** an incorrect reactant **DO NOT ALLOW** an incorrect reactant **DO NOT ALLOW** an incorrect product **DO NOT ALLOW** anaerobic respiration if oxygen is named as a reactant **DO NOT ALLOW** an incorrect product **ALLOW** glucose used in either aerobic or anaerobic respiration but only credit once **IGNORE** make/produce energy / mitochondria / oxygen debt **Examiner's Comments** Several candidates did not attempt this question on the paper. This was a knowledge and understanding AO1 question on aerobic respiration. Several candidates did not gain marks and the distribution amongst scoring marks was evenly spread. The most common scoring mark was the ability to link ATP production with the process of respiration. **Assessment for learning** Aerobic respiration has been identified as a knowledge gap in the candidates' understanding of key process in cell biology. Candidates would benefit from reinforcement and review of their understanding of respiration at different points in the GCSE course. E.g. decay, carbon cycle, enzymes, metabolism and thyroxine.

					Misconception Many students got aerobic and anaerobic respiration mixed up, and aerobic respiration produced lactic acid and aerobic respiration is the absence of oxygen. There were a lot of candidates mixing up reactants and products and negated marks accordingly. A small number of candidates also confused ATP production with protein synthesis.
			Total	**4**	
5			Oxygen ✓ Haemoglobin ✓ Lactic ✓ Natural selection ✓	4 (4 x1.1)	**IGNORE** evolution **Examiner's Comments** 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**	
6	a		Amino acids ✓ Enzymes ✓ Fatty acids and glycerol ✓ Sugar ✓ Respiration✓	5 (AO 1.1) (AO 1.1) (AO 1.1) (AO 2.1) (AO 1.1)	Either order **Examiner's Comments** The majority of candidates gained at least 1 mark for the most common scoring mark for correctly identifying ATP is produced by respiration. A minority could correctly complete each sentence. Most candidates mixed up the role of enzymes with amino acids

					and also could not correctly identify fats are broken down into glycerol and fatty acids. **Assessment for learning** Knowledge gap identified with digestion of large (polymer) molecules and the role of enzymes into their constituent small molecules (monomer) respectively. Centres should reinforce the role of enzymes in digestion of protein, lipids and carbohydrates.
	b		Person C ✓ Risk identified as dangers of following the diet ✓ Benefit identified that the diet helps overweight people reduce health issues ✓	3 (3 ×AO 3.1a)	If answer is not person C then award 0 marks. **Examiner's Comments** Most candidates were able to achieve at least 1 mark for correctly identifying Person C discussing both the risks and benefits of following the diet. To gain more marks candidates needed to correctly identify which part Person C stated which referred to the risks and the benefit without simply rewriting the stem of the question, which only the minority could.
	c		**Any two from:** Starch and sugar are both carbohydrates ✓ To test for starch, you need to use iodine test ✓ To test for sugar you need to use Benedict's test ✓	2 (AO 3.1b) (AO 2.2)	**AW** potassium iodide If no other marks awarded allow sugar and starch test / iodine and benedict's test for one mark **Examiner's Comments** This tested the candidates' AO3 skills in analysis as they needed to evaluate the information and form conclusions which food reagent tests you use to test for carbohydrates. The majority of candidates could not do this and did

					not correctly identify the two different tests for carbohydrates, the iodine and Benedict's test. **Assessment for learning** This is highlighted as a knowledge gap for food/biological molecule reagent tests. Candidates could not identify Benedict's test for sugar/glucose and iodine test for starch. This learning of a PAG should be reinforced throughout the KS4 curriculum.
			Total	**10**	
7			**A**	1 (AO 2.1)	
			Total	**1**	
8			Fat ✓ Oxygen ✓ Attack ✓	3 (AO 1.1)	**Examiner's Comments** 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**	
9			B ✓	1 (AO 1.1)	**Examiner's Comments** Candidates again could not factually recall that monomers join together to form polymers and amino acids are an example of a monomer. Candidate's answers ranged equally from A-D.
			Total	**1**	
10			A ✓	1 (AO 1.1)	**Examiner's Comments** Most candidates were not able to recall that ATP is produced in both aerobic and anaerobic respiration. This demonstrated a lack of understanding of respiration a key chemical reaction. Answers ranged between all options A-D.

			Total	**1**	