

# **Human Biology**

Advanced GCE A2 H423

Advanced Subsidiary GCE AS H023

## **Report on the Units**

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**January 2009**

**H023/H423/MS/R/09J**

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This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

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**Advanced GCE Human Biology (H423)**  
**Advanced Subsidiary GCE Human Biology (H023)**

**REPORT ON THE UNITS**

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## Chief Examiner's Report

This was the first opportunity for Centres to enter candidates for the new specification GCE Human Biology. Only one unit, *F221: Molecules, Blood and Gas Exchange*, was examined in this first session. The number of candidates entered (2888) confirmed the impression received from INSETs that the uptake of new specification Human Biology has increased substantially compared to the legacy specification.

In developing the new specification great care has been taken to preserve the 'context based' approach to biological principles, and this appears to be valued by both candidates and teachers. There is a danger, however, that candidates may miss the key underpinning biology. This was the case with Q.2(c)(ii) in the F221 paper this session. The learning outcome being examined in the question was 1.1.3d, but the context used was that of non-competitive inhibition. The context was described in the question. The question was not testing factual knowledge (Assessment Objective 1) but rather was testing the application of knowledge in a novel context (Assessment Objective 2), hence the use of the command word "suggest". Thus, no previous knowledge of the context was required – but a sound biological knowledge of the molecular structure of enzymes and the mechanism of enzyme action was. Teachers need to be aware that, with a context based approach, the biological principles in the specification need to be very clearly identified.

The examiners were surprised by the overall quality of answers to Q.4 on the heart and heart action. This question proved to be far more demanding than had been anticipated and may reflect the changes that have occurred in the content of GCSEs. Teachers need to be aware that topics such as the heart may not have been addressed since KS3 and schemes of work need to reflect this.

### Understanding and answering the questions

Candidates found the F221 paper very accessible, with all questions generating excellent responses from some of the candidates. In the paper, most free response questions are worth only 2 or 3 marks. It is important that candidates identify the command word in the question and the number of marks available so that they can produce succinct answers. A list of command words is available in the AS Practical Skills Handbook, which is free to download from the OCR website. With relatively short responses, candidates will not have time to 'get into their stride' with a preamble that repeats some of the stem of the question. The use of bullet points in responses is entirely acceptable and can help them to avoid this.

One concept that seemed to prove difficult for candidates to interpret was how structure and function relate to each other (Q.1(c) and Q.6). This was surprising, and suggests that this is an area where candidates would benefit from some support.

#### Teaching tip

As a starter, give out cards, half with the name of a structural feature, for example the thin wall of an alveolus or a capillary with the other half of the cards have functions. Candidates move round the room until they find a 'match' between structure and function. Better still, ask them to produce the cards themselves but check the wording. Several candidates lost marks by referring to the thin 'cell wall' of a capillary.

## Mathematical requirements

The examiners noted that a not insignificant number of candidates failed to complete the calculation in Q.4(c)(i), despite identifying the sum that would generate the answer. This seems to indicate that these candidates did not have a calculator in the examination room. Centres are under no obligation to provide their candidates with calculators, however the question paper front cover rubric lists “electronic calculator” in the “Other materials required” section and a reminder to candidates would certainly benefit some.

## Looking toward the June 2009 session – F222

Unit F222 will be examined for the first time in the June 2009 session. Teachers are reminded that the first two questions on the paper will be based upon pre-release case study material that candidates should have studied prior to the examination. This material will be made available in the form of an Advance Notice, which must be downloaded in PDF format from either Interchange (OCR’s secure web portal) at <https://interchange.ocr.org.uk> or from the OCR public website at [www.ocr.org.uk](http://www.ocr.org.uk).

*NOTE: The F222 Advance Notice case study material will not be dispatched in printed form to Centres. It must be downloaded from the aforementioned web pages.*

### Teaching tip

The F222 Advance Notice for the June 2009 session should be issued to candidates on or after **13 March 2009** at the discretion and convenience of the Centre. Candidates can be given the material at any time on or after this date, but it is suggested that they should be given it **at least four weeks** prior to the date of the examination.

Candidates should be allowed to discuss the Advance Notice material freely, and can also be given support and advice on the interpretation of the content by the teacher. Candidates should be encouraged to investigate and research the topics covered in the Advance Notice case studies prior to the examination. It should be stressed that candidates will not have sufficient time to read the case studies for the first time in the examination room, and will not be well equipped to answer the questions based upon them if they have not researched the topics covered by the material in advance.

Note that candidates are **not** permitted to take their copy of the Advance Notice into the examination with them. They will be given a fresh copy as an insert to the question paper.

Candidates will be expected to apply their knowledge and understanding of Unit F222 to the questions based on the Advance Notice. Teachers are reminded that some learning outcomes of Unit F222 build upon those of Unit F221.

The F222 question paper contains some questions where the candidates will need to produce written answers of some length. The marks awarded for quality of written communication are **not** for correct use of technical terms spelt correctly as in Unit F221, but are for skills such as sequencing, giving a balanced account or linking data to the point being made.

The content of Unit F222 is similar to the legacy 2857 and parts of 2856 relating to respiratory and cardiovascular disease. Past papers for 2856 and 2857 are available to download for free from the OCR website.

## **INSET**

OCR is offering a programme of training events related to the new GCE Human Biology A-Level specification. Further details are available from the OCR website at [http://www.ocr.org.uk/Data/publications/training/Science\\_Training\\_Programme.pdf](http://www.ocr.org.uk/Data/publications/training/Science_Training_Programme.pdf)

### **Forthcoming INSET events for new GCE Human Biology**

#### ***Get Started – towards successful delivery of the new specification***

These **new full day** courses give guidance and support to those delivering the new GCE Human Biology (H023/H423) specifications.

#### **Course dates and codes:**

A2 courses: Wednesday 1<sup>st</sup> April 2009 (London, OSCD101)  
Friday 3<sup>rd</sup> April 2009 (Birmingham, OSCD102)

Fee: £160 standard course rate (including refreshments, lunch and course materials), or £190 if you book within 7 days of the course date.

Places may be booked on these courses using the booking form available on-line at [http://www.ocr.org.uk/training/alevel\\_inset\\_training.html](http://www.ocr.org.uk/training/alevel_inset_training.html). Please quote the course code in any correspondence.

## F221

### General Comments

The paper was taken by most candidates as their first AS level examination and it proved to be a positive experience for the majority of candidates. All questions were answered well by at least some candidates and the teaching of this unit had clearly prepared the candidates to be able to access the questions on the paper. Questions on the heart and circulation proved to be the most challenging, and this may be partly due to the fact that this topic is now studied for the first time at AS level. It is important that Centres provide candidates with the opportunity to consolidate their knowledge and understanding of this complex topic.

### Comments on Individual Questions

- 1 (a) This question was only answered well by higher-attaining candidates. Quite a few candidates did not realise that they were simply being asked to compare plant and animal cells. Some candidates were confused by the term 'structural', and gave functional similarities and differences. Other candidates did not have experience of answering questions that ask for a comparison, and although they gained credit for correct similarities they failed to gain credit for the differences because they did not match the statements.
- (b) Many candidates gained credit for describing the correct function of **A** (Golgi) and **C** (rough endoplasmic reticulum), but failed to gain credit for the function of **B** (nucleus or nucleolus) because their answers were too vague (e.g. 'it controls the cell').
- (c) This question was only answered well by higher-attaining candidates who described structural features of the erythrocyte and correctly linked them to how they helped the erythrocyte to carry out its function of transporting oxygen. Many candidates gained credit for the QWC mark for correctly spelling two terms.
- 2 (a) Many candidates answered this question well and gained credit for correctly identifying the elements in different types of biological molecules. However, quite a few had no idea and were obviously just guessing.
- (b) Many candidates gained credit for the correct response of facilitated diffusion or active transport. The most common incorrect response was 'diffusion' unqualified.
- (c) (i) There were many very good responses to this question and candidates correctly named the bond as a peptide bond formed by a condensation reaction. Many candidates gained the QWC mark for the correct spelling of two technical terms.
- (ii) Many good answers that included reference to the shape of the enzyme or active site being changed and preventing the substrate binding to the site. The most common mistake was for candidates not to have read the information given about eflornithine attaching at a position other than the active site, and going on to say it blocked the active site.
- 3 (a) This question was well answered. Many candidates gained credit for: sitting Emma down; raising her arm; leaving the glass in the wound; applying pressure on a pad around the wound; and placing another pad on top if the first becomes soaked with blood. A few candidates described applying a tourniquet, which was not credited.

*Report on the Units taken in January 2009*

- (b) Most candidates were credited with one mark for mentioning that she needed other components of blood as well as red blood cells. Some gained a second mark for stating that she had lost a lot of blood. Very few gained a third mark for describing the need to restore blood volume or blood pressure.
  - (c) The majority of candidates were credited with one mark for stating that calcium ions are needed for blood to clot. Some candidates went on to describe calcium ions acting as a cofactor and were credited with the second mark. Very few candidates described the role of calcium in converting prothrombin into thrombin.
- 4
- (a) This question on labelling a diagram of the heart elicited a wide range of responses. Higher-attaining candidates were credited with all five marks, whereas lower-attaining candidates were totally confused and failed to be credited with any marks.
  - (b)
    - (i) Very few candidates answered this question correctly. They failed to make the connection between the change in pressure and the opening of valves. Many just referred to systole and diastole.
    - (ii) Many candidates answered this question well, and were credited with two marks for stating that the pressure in the right ventricle was lower because it was part of the pulmonary circuit. Some higher-attaining candidates went on to describe the right ventricle as having a thinner muscular wall and were credited with the third mark.
    - (iii) This question was well answered and many candidates stated that the pressure in the left atrium increased as it filled with blood.
  - (c)
    - (i) It was pleasing to see that most candidates carried out the calculation correctly.
    - (ii) This question was well answered. Many candidates scored at least one mark by stating that Sam's stroke volume was higher. A large number then went on to describe how Sam's heart muscle had increased in size. Very few candidates quoted figures from the data.
- 5
- This cloze question was well answered. The most common mistakes were to write 'squamous' instead of 'ciliated', and 'oil' instead of 'surfactant'.
- 6
- (a) This question proved to be one of the most challenging and only higher-attaining candidates scored four or more marks out of six. Many candidates gave vague, mixed-up answers. Some were confused by the term 'feature' and others failed to link the feature to how it helped the capillary to carry out an exchange of material between the blood and tissue fluid.
  - (b)
    - (i) This question was answered well; most candidates correctly identified **L** as the venous end of the capillary because it had a lower hydrostatic pressure.
    - (ii) This question proved to be challenging. Many candidates had the right idea but gave vague answers. They failed to mention that the lack of contraction of skeletal muscle in the legs results in blood flow in the veins slowing down and that this leads to an accumulation of tissue fluid.

# Grade Thresholds

Advanced Subsidiary GCE Human Biology (H023)  
January 2009 Examination Series

## Unit Threshold Marks

Unit		Maximum Mark	A	B	C	D	E	U
F221	Raw	60	50	44	39	34	29	0
	UMS	90	72	63	54	45	36	0

## Specification Aggregation Results

The first AS aggregation for this specification will be in June 2009.

For a description of how UMS marks are calculated see:

[http://www.ocr.org.uk/learners/ums\\_results.html](http://www.ocr.org.uk/learners/ums_results.html)

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