

# Examiners' Report January 2009

GCE

## GCE O Level Human Biology (7042)

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information, please call our GCE line on 0844 576 0025, our GCSE team on 0844 576 0027, or visit our website at [www.edexcel.com](http://www.edexcel.com).

If you have any subject specific questions about the content of this Examiners' Report that require the help of a subject specialist, you may find our **Ask The Expert** email service helpful.

Ask The Expert can be accessed online at the following link:

<http://www.edexcel.com/Aboutus/contact-us/>

January 2009

All the material in this publication is copyright  
© Edexcel Ltd 2009

## Contents

1.	Unit 7042/01 Examiners' Report	5
2.	Unit 7042/02 Examiners' Report	8
3.	Grade Boundaries	11



## 7042/01 Human Biology Paper 1

### General Comments

Many candidates demonstrated a clear grasp and understanding of the human biology and scored freely with their answers. There were however, some common failures. Firstly, when a question is asking for a comparison there should always be two halves to the answer covering both items under comparison. For example, a vein has valves but an artery does not, rather than just, veins have valves. Candidates must also make better use of the mark allocation shown for each question. The rule of thumb must be that a point has to be made for each mark so that a three mark question is unlikely to be answered fully with merely one sentence. Candidates should also be prepared to draw graphs and bar charts using a sharp pencil and a ruler, otherwise they will most probably be penalised for inaccurate drawing. Where a space is provided for the drawing of a diagram, the anticipation is that most of the space will be used in the production of the diagram.

The term 'germ' or 'germs' was used by many candidates. This term always scores zero marks and should not be used. Appropriate terminology is bacteria, or pathogens for disease causing organisms and where appropriate, viruses or fungi. Micro-organisms can be used but this is a general term covering all of the above and may not be appropriate in certain circumstances.

### Question 1

There were a number of common mistakes in answers to part (a) namely, in description 4 which was often identified as the tympanum rather than the cochlea. Part (b) caused problems for candidates with few progressing beyond a reference to or description of stereoscopic vision. Some were able to refer to the impairment of distance judgment but very few made any reference to speed determination.

### Question 2

Common mistakes in answer to part (a) were to substitute the term 'chloroplast' for 'chlorophyll', 'stomata' for 'surface area', 'minerals' for 'water' and 'food' for either 'glucose' or 'starch'.

In answers to part (b) many candidates wrote about gas exchange, when a more specific reference to diffusion of carbon dioxide was required. Some recognized that the thin leaf meant that the distance for diffusion was short. Comparative terms, such as easier, faster, better are required, rather than 'easy'.

More efficient or easier light penetration was rarely a response - absorb more light was more common, but not correct.

### Question 3

Both parts (a) and (b) were usually well answered though candidates who were unsure left the space blank rather than give incorrect answers.

Most candidates understood that large numbers of sperm were produced to increase the probability of successful fertilization. However, fewer alluded to the fact that many sperms never reach the ovum.

Part c(ii) was generally well answered, with the tail of sperm, and the acrosome the most usual responses, though in some cases the candidate could not name the acrosome and

referred, more vaguely, to enzymes. Fewer candidates made reference to size differences and the storage of food in the ovum.

#### Question 4

Again, part (a) was well answered by many candidates. There were many responses stating that the blood vessels move nearer the surface of the skin in hot conditions, which is not an acceptable answer and there were occasional answers suggesting that the capillaries were on the skin surface.

There were many possible answers to part (b). Some candidates gave the prevention of entry of bacteria more than once, and it was important to specify protection against UV light, and not just 'harmful rays'.

A reference to optimum temperature for enzyme activity was required in answer to part (c).

#### Question 5

Most candidates could identify the ribs, a ball and socket and a hinge joint. Many described a hinge joint as 'allowing movement in one direction' which is incorrect. Movement in one plane was required. The functions of the ribs was usually well known though many candidates failed to give an adequate description of intercostal muscle attachment to bring about the movements of ventilation. 'Used for movement in breathing' was a common vague answer.

Some candidates were able to state that Z attached muscle to bone but were unable to go further and describe how the tendon transmits the pull of the muscle.

In answer to part (d) most candidates knew that the biceps contracts, but the radius needed to be identified as the relevant bone in the forearm. Very few candidates mentioned the elbow acting as a hinge.

#### Question 6

Part (a) (ii) was generally a well-answered question, although a few candidates had not read the question and described features present in the diagrams. Failure to make adequate comparisons caused some candidates to lose marks.

In answer to part 6(b) (ii) a large number of candidates drew a diagram, but it was not a transverse section and therefore not given any marks. Diagrams should occupy the space provided in the paper.

#### Question 7

The definition of homeostasis was correctly stated by most candidates in answer to part (a). Some candidates lost a mark because they stated it is 'maintaining the internal environment' but omitting to describe it as constant, or being kept within narrow limits.

The two hormones were usually correctly identified in answer to part (b) but, far fewer candidates could give an adequate reason as to why A and B are hormones. The diagram shows that they are released into the blood, this being a classic definition of a hormone. Although the majority of candidates appreciated that a carbohydrate rich meal was the cause, they failed to make any reference to absorption into the blood after digestion. A surprising number of candidates could not give two places where glycogen is stored, a common incorrect answer being 'cells'.

There were some very pleasing answers to part (g) from candidates who fully understood the principles of osmosis.

### Question 8

In order to gain full marks for this question, the bars had to be carefully drawn. Many candidates would benefit from using a sharp pencil, and a ruler for all lines drawn.

Few candidates achieved all three marks for part (b)(iii). Reference to the use of muscles and to body size was rare.

A general statement that males require more energy than females was required with a specific relevant comparison quoting figures from the table e.g. male vs. female teenager, for the second mark.

In answer to part (d)(i), many candidates stated that a pregnant mother eating for two would put on excess weight but few used the data provided to inform their answers.

Many candidates were able to give more than one correct answer to part (d)(ii) such as a diet enriched with protein or calcium.

### Question 9

Many candidates realized that any sweat produced would be absorbed by the paper in answer to part (a)(ii).

Very few candidates were able to answer fully part (a)(iii). The use of comparative terms, such as 'more' and 'greater' was required to fully explain the results.

Most answers to part (b) mentioned the calculation of the mean, but few were able to associate repetition of results with reliability.

## 7042/02 Human Biology Paper 2

### General Comments

Most candidates managed to respond to most sections within the space provided. Judging from the unequal numbers of responses for parts of the same question a number of candidates appear to have started questions and then abandoned them, without indicating this. Candidates should be warned of the need to indicate clearly if they have completed a response outside the area allowed for it or the additional work may be overlooked. It was not always obvious to the examiner that there was a continuation of an answer.

### Section A

#### Question 1

Most candidates knew how to test a sample of urine for the presence of glucose although a number failed to mention that the reagent should be heated with the sample. In (a)(ii) most recognised the lack of insulin as the cause of the problem but many did not develop their response beyond this fact. The uses of water in the body were not well explained. Candidates who read the question carefully should have noted that they were required to describe two uses not write a list. Most recognised the role of water in temperature regulation but few named a second use such as a transport medium or as a solvent. Many candidates gained maximum credit in (c) with detailed and accurate accounts. A few weaker candidates concentrated on diet and excretion without any reference to ADH or osmoregulation.

#### Question 2

Once again the basic food test (for starch) was well known but candidates who had carried out such a test on a solid food should be aware that the food turns dark blue or black if starch is present. 'Blue' is too vague for a response and mauve or purple incorrect. Starch digestion and the uses of its product (glucose) in the body were well known. Some candidates confused the processes occurring in the stomach with those taking place in the duodenum. In part (b) most candidates realised that the diet would be unbalanced, but a large number failed to expand on this to suggest what might be lacking and the likely effects of such a deficiency. The mark allocation should have indicated that this was required.

#### Question 3

In some sections of this question candidates did not appear to have read the question with sufficient detail. Part (a) of this question was poorly answered. Drawings of the epithelial cell were poorly drawn and labelled. Some candidates drew sections through the cell while others drew details shown in an electron micrograph. Differences in the two cells were very poorly described and some candidates made no mention of the epithelial cell. The role of cilia was misunderstood with many believing that they secreted mucus and also that they trap bacteria and knock them back up the trachea. Part (b) proved to be very difficult for many candidates. Most knew that enzymes were made of proteins and a few mentioned active sites but other structural details were poor. In (b)(ii) most candidates mentioned denaturing but not all could explain what this meant or how the functioning of the enzyme would be affected.

#### Question 4



This was not the most popular of questions in this section and candidates seemed unfamiliar with sex-linked features.

In (a) knowledge of the structure of a chromosome was quite good but their role in determining features in the body was poorly understood. Genes were usually mentioned but the link between DNA and genes was rarely explained nor how the DNA coded for the formation of structural proteins or enzymes. Candidates, who did not understand the significance of the XX and XY chromosomes in the determination of the sex of a person, were unable to respond correctly to part (b). Many did not appear to understand that the Y chromosome carries few active genes and thus any gene passed to the male on the single X chromosome will make itself felt, whether dominant or recessive. Most candidates found the explanation required in (c) the easiest part of this question.

### Question 5

The formation of urea was well known but too many candidates still think that proteins rather than just excess amino acids are deaminated. In (a)(ii) the circulation between the liver and kidney was usually described accurately although a surprising number failed to mention that the urea travelled in the blood plasma. The functioning of the kidney tubule was well known in part (b). Responses to (c) were very varied. Most mentioned diet but few also realised that demand for protein in the body would also vary.

## Section B

Responses to questions in this section were generally of poorer quality than those in section A

### Question 6

Candidates who attempted this question should have realised from the allocation of 4 marks to each section of part (a) that simply stating a function in each case with no further explanation would be inadequate. Most knew the role of phagocytes but there was considerable confusion about antibodies. Some claimed that antibodies formed white blood cells, and others that these were found on the surface of pathogens. Many gave lengthy accounts of the clotting process, but failed to note that the question was about how it helps prevent disease. Accounts of artificial immunity were very varied and once again candidates who paid attention to the mark allocation should have realised that just mentioning vaccination would be inadequate.

### Question 7

It was expected that candidates would realise that raw sewage was likely to contain large numbers of pathogenic bacteria and also eggs and larval forms of gut parasites and also provide conditions in which these might survive or even continue to reproduce. Some candidates confined their responses to mentioning the bacteria and then writing at some length about the bad smell.

In (b), eutrophication was dealt with in some detail although the sequence of events was sometimes erroneous. In part (c) there was the usual confusion between treatment of water for drinking and sewage treatment. Most understood the early screening processes and later chlorination but few showed any real understanding of slow or fast filters. References to

filter beds, sprinkle filters and anaerobic fermenters revealed confusion with sewage treatment.

### Question 8

This was not a popular question and it was noticeable that areas of the syllabus well known to candidates in the past were poorly dealt with this year. This was especially so in part (a)(i) where the role of the housefly was not understood. Some described how it bit humans, transferring typhoid bacilli by injecting saliva and most could go no further than it settling on faeces. In (a)(ii) few candidates realised that it was the toxins produced by the bacteria that produce the symptoms of the disease and that an incubation period of several days was necessary for the bacteria to reproduce enough for toxins to reach the level that would cause symptoms. Those candidates who restricted their response to reducing the spread of typhoid scored well in this section but some responses were too vague. In part (c) there was some confusion between bacteria and fungi with many quoting the activities of yeasts as their example as if they thought this was a bacterium. Many candidates are convinced that antibiotics are produced by bacteria, rather than by fungi.

### Question 9

This was the least popular question on the paper.

There were some good diagrams of pit latrines but many were very poor. Most candidates realised that permeable soil would allow liquid to drain away but few could explain the advantage of this and the need to site the latrine well away from wells was also poorly answered. In both parts (c) and (d) it was hoped that candidates would apply their knowledge to answer the problems posed. In (c) most realised that disinfectants would destroy useful decomposers and thus stop the breakdown of the sewage, and in part (d) very few realised that the density of the population made pit latrines untenable in cities. The hint about 30 metres in part (b) failed to get many thinking and most just concentrated on smell.

## HUMAN BIOLOGY 7042 - GRADE BOUNDARIES

---

---

Grade	A	B	C	D	E
Lowest mark for award of grade	149	132	115	105	91

**Note:** Grade boundaries may vary from year to year and from subject to subject, depending on the demands of the question paper.

---

---

Further copies of this publication are available from  
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467  
Fax 01623 450481

Email [publications@linneydirect.com](mailto:publications@linneydirect.com)

January 2009

For more information on Edexcel qualifications, please visit [www.edexcel.com/quals](http://www.edexcel.com/quals)

Edexcel Limited. Registered in England and Wales no.4496750  
Registered Office: 190 High Holborn, London WC1V 7BH