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Examiners' Report / Principal Examiner Feedback

Summer 2010

GCE O

GCE O Human Biology (7042) Paper 02

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General Comment

There were good responses for each question but Q4 was markedly less popular than others in section A. On a number of scripts there was evidence that candidates had not planned their response before beginning the answer and thus over ran the space provided and needed extra sheets. Often these extra responses contained irrelevant material. There was evidence of careless reading of questions, often leading to responses that were biologically correct but did not answer the question set.

SECTION A

Question 1.

Many candidates attempted this question and frequently scored well especially on sections (a) and (b) In (a) the process of mitosis was well known and usually described in detail. Differences resulting from division by mitosis and meiosis were known although a few candidates concentrated on differences in the two processes rather than their results.
In part (c) most knew factors that affected the rate of mutation but did not always express this clearly. Smoking was considered too vague although reference to cigarette tar was acceptable. Vague suggestions such as drugs or chemicals were not credited. Part (c)(ii) was poorly answered with many naming conditions caused by mutations, but not suggesting how these were considered harmful.

Question 2.

This was also a popular question but not always high scoring. Most candidates were able to define a reflex action and state its value to the body. There was a common misconception that reflexes never involve the brain, in spite of the iris reflex appearing commonly in questions. The diagrams of a reflex arc were very varied in quality. Some candidates would possibly have been better choosing another question despite the allocation of eight marks to this section. Structures had to be accurately drawn as well as labelled to gain credit.
Section (b) was one of those areas where failure to read the question with sufficient care led to inadequate and superficial responses. A number of responses implied that damage to the bones directly prevented the transmission of nerve impulses and others that damage to the bones in the neck region would destroy the medulla. Clearly these responses were not well thought out. Part (b)(ii) was poorly answered with few candidates realising that nerve cells cannot regenerate.

Question 3.

This was a popular question, but once again many candidates were let down by the very poor quality of their diagrams. Most named the two muscles correctly and were able to state which was contracted when the forearm was raised but this was not always shown on the diagram. The tendons joining the muscles to the bones were inaccurately shown or totally unclear and while the humerus was usually correctly labelled, the ulna and radius were often reversed. Some candidates failed to show the complete humerus so that the attachment of the muscles was inadequate.

The range of movement at the two joints was well known. In part (b) it might have helped if some candidates had read the two sections before they began their response. In (b)(i) reactions in the mitochondria should have been described (aerobic respiration). Far too many candidates still claim that energy is produced rather than released. And some still seem to think it comes from the oxygen molecule. Anaerobic respiration was dealt with rather better in (b)(ii) but few commented on the limited amount of energy released.

Question 4.

This was the least popular question in this section. Very few of those who chose this question showed any real understanding of the relationship between the three fluids in (a)(i). In (a)(ii) the role of blood plasma as a transport medium was generally known but tissue fluid was just mentioned as existing around the cells. Few mentioned diffusion of materials into and out of the cells. Some knew that lymph had a role in the body's defence mechanism.

Part (b) was poorly answered with few being able to explain the importance of the increased blood flow in (b)(i) or to make sensible suggestions in (b)(ii) or (iii). In (b)(iii) suggestions such as running marathons or undertaking vigorous exercise were worrying!! Reducing alcohol intake was acceptable but not instructions to stop drinking.

Question 5

This was a popular question but in many cases candidates failed to read the question with sufficient care and responses, while on the correct topic, often failed to answer the question. This was especially true in (a)(i) where a description of the urinary system was required. Many gave detailed accounts of nephron structure but failed to mention structures such as the ureters, bladder or urethra.

In (a)(ii) the majority of candidates gave good account of osmoregulation but completely failed to mention the excretory role of the kidneys or processes such as ultrafiltration or selective reabsorption.

In (b) the effects of sweating on a hot day was well explained although a few candidates failed to realise that the question stated that little water was available for drinking. Most realised that a protein rich meal would increase the urea concentration of the urine, although events in the liver were sometimes confused.

SECTION B

Question 6.

Most of the candidates who chose this question gave good reasons why sewage should not be allowed to contaminate water supplies. In (b) eutrophication was well described by high scoring candidates though there was some confusion as to whether the sewage itself or the consequent algal bloom prevented light penetrating to the lower layers of the lake. A few candidates still seem to think that the photosynthesis of the algae removed oxygen from the lake.
In (c) most candidates gave good accounts of a modern sewage treatment plant with less confusion between this and water treatment than has occurred in the past. Sometimes the aerobic tank or filter beds were not fully described.

Question 7.

Most candidates noted that bacteria had only a strand of DNA while fungi had nuclei inside membranes, but fewer gave a second correct difference. In (b) most described saprophytic nutrition in some detail but only a small number also mentioned parasitism as a mode of nutrition. A surprising number seemed to think that many fungi could also photosynthesise. The transmission of athletes foot was poorly described, and a number just suggested general measures such as 'good hygiene' or 'avoid overcrowding', which were too vague. In (d) uses of fungi were well known and candidates frequently gained maximum credit here.

Question 8

The diagrams of the virus were very varied in quality and some had labels suggesting incorrectly that cytoplasm and cell membranes were present. Those who chose to draw a bacteriophage created unnecessary problems for themselves. The basic stages of viral reproduction were well known. The majority of candidates identified at least two ways in which viruses differed from bacteria. The responses here could include differences in both behaviour and structure.
The role of vaccination in developing immunity to polio was well explained but in spite of explaining here how vaccines developed immunity over a period of time, many in section (b)(ii) suggested their use after symptoms had developed, suggesting they did not really understand how they worked. Others suggested the use of antibiotics that are usually ineffective against viral infections.

Question 9.

In (a) most explained how oxygen was released during photosynthesis but not all gave sufficient details of the process to explain how energy rich carbohydrates were formed or that these could be converted into fats, proteins etc. Bioaccumulation along the food web was usually well described.
In (b)(i) candidates were clearly familiar with the formation of sulphur dioxide and its effect on living things. A small number appear to think it also has a major effect on both the ozone layer and on global warming.
In (b)(ii) reasons for the increase in air pollution were well described and many sensible suggestions to reduce the levels of the pollutant gases were made.

HUMAN BIOLOGY 7042, GRADE BOUNDARIES

Grade	A	B	C	D	E
Lowest mark for award of grade	**142**	**124**	**107**	**97**	**80**

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

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