HUMAN AND SOCIAL BIOLOGY

Paper 5096/01
Multiple Choice

Question Number	*Key*	*Question Number*	*Key*
1	**C**	21	**B**
2	**B**	22	**C**
3	**B**	23	**C**
4	**A**	24	**B**
5	**B**	25	**D**
6	**B**	26	**C**
7	**B**	27	**D**
8	**C**	28	**D**
9	**A**	29	**C**
10	**D**	30	**A**
11	**D**	31	**A**
12	**D**	32	**B**
13	**A**	33	**B**
14	**A**	34	**D**
15	**C**	35	**A**
16	**D**	36	**D**
17	**A**	37	**C**
18	**D**	38	**D**
19	**A**	39	**A**
20	**B**	40	**A**

General comments

The overall statistics show a mean of 20.4 (51%) that is slightly lower than that obtained last year, while the standard deviation of 7.2 and alpha of 0.84% are very similar.

The general standard of the answers was pleasing. Most questions performed as expected and there were few with poor statistics. Only questions **5** and **31** proved a little too easy with high facilities, although this showed good understanding of the objectives tested. Questions **10**, **24**, **28** and **38** were acceptable, but they were more difficult as shown by their low discrimination figures.

Comments on specific questions

Question 5

This is an example of a question that proved very easy for candidates, testing that plants form the basis of all food chains. Perhaps some candidates looking for a 'trick' question chose sunlight, although of course this cannot be directly utilised by chicken. It should be noted that CIE aims to test clear objectives, rather than setting 'trick' questions.

Question 10

The low facility shows that candidates had difficulty interpreting the diagram of a vertical section of a molar tooth, to understand its structure and then relate this to a transverse section. Only a transverse section at line **D** through the tooth would show the periphery of the tooth in outline and the two spaces inside for the pulp cavity. Teachers familiar with diagrams should recognise that some candidates have difficulty in interpreting them fully. The objective tested here was full understanding of diagrams.

Question 24

The positive distractor shows that many candidates equate transfer across the synapse with an electrical impulse. Teachers, who frequently make this analogy, should make it clear that it is not an exact analogy. It should be explained that neurotransmitter substances passing across the synapse are complex chemicals. Similarly nerve impulses are not electrical impulses, but are due to the movement of positive and negatively charged ions.

Question 28

Few candidates showed that they could work out the correct answer to this quite difficult question. They correctly deduced that blood at **A** (fetal vein) supplying the fetus, would not contain quite as much glucose as the blood from the mother at **D** (a maternal artery), because on its way across the placenta some of the glucose would be used in respiration. Similarly a little carbon dioxide and urea produced in the placenta would be added to the blood passing through it. However, 42% of the candidates chose option **A**, where the blood is supplied from the placenta to the fetus.

Question 38

The positive distractor here indicates a rather unusual misconception, that filters can remove microorganisms. While filters are used in both sewage disposal and water purification works, they would have little, if any, restriction on the passage of microorganisms. Microorganisms in both sewage disposal and water purification play a major role in decomposition of the organic material.

Question 39

The low discrimination here is difficult to interpret, particularly when over half the candidates obtained the correct answer and the distractors are all so unlikely. That 14% of the candidates thought smells are a risk to heath is a little disconcerting.

HUMAN AND SOCIAL BIOLOGY

Paper 5096/02

Theory

General comments

Almost all candidates were able to complete both Section A and Section B, thus confirming that the time allowed for completion of the paper was adequate. A very small number of candidates (< 1% total entry) did not comply with the rubric for Section B and answered both **10 (Either**) and **10 (Or).**

In general, the overall performance of candidates was comparable with that seen in recent examinations. The proportion of stronger candidates was, once again, at an increased level.

In Section A, whilst none of the questions proved to be too difficult some candidates appeared to find question **5** to be more challenging than others in the section.

In Section B, most candidates gave relatively strong answers to **9**, but found parts of **8, 10(Either)** and **10(Or)** to be more demanding.

Comments on specific questions

Question 1

(a) This required candidates to identify the roles of diffusion, osmosis and active transport in the movement of water and glucose molecules between glucose solutions of differing concentrations. Whilst many candidates scored all three of the available marks, there was often confusion apparent especially between osmosis and diffusion.

(b) It should be noted that**,** whilst **(i)** required the identification of the process by which energy is released (respiration), **(ii)** required identification of the cell structure in which energy release occurs (mitochondrion). Although many candidates scored both of the available marks, a significant number did not correctly identify the mitochondrion.

(c) Although most candidates scored the available mark for **(ii)**, answers to **(i)**, **(iii)** and **(iv)** were generally disappointing, with many candidates giving reasons that were insufficiently precise.

(d) In general, the standard of response was disappointing. Inspiration brings oxygen into the alveolus, whilst the circulation of the blood removes oxygenated blood from the alveolus and returns deoxygenated blood to the alveolus, thereby maintaining a concentration difference.

(e) **(i)** and **(ii)** required some simple arithmetic manipulation of data presented in Table 1.1. Many candidates either selected the wrong data and/or did not calculate correctly. Two differences between inspired and expired air were required for **(iii)**. Some candidates did not give a comparison and simply answered *temperature* or *moisture*. The majority of candidates scored the available mark in **(iv)**.

(f) **(i)** required candidates to give reasons why large scale deforestation contributes to the rise in atmospheric carbon dioxide. Many candidates did not link the uptake of carbon dioxide by trees with photosynthesis, thereby missing a marking point. Others gave either imprecise answers or linked carbon dioxide with oxygen. In **(ii)**, many candidates made incorrect references to ozone layer or acid rain rather than focussing on global warming/greenhouse effect or a resulting consequence.

Question 2

(a) Most candidates had no difficulty in identify Vitamin D for **(i)** and fibre for **(ii)** using the information provided, thereby gaining both of the available marks.

(b) Most candidates scored one of the available three marks, but relatively few identified both substances and fewer still were able to describe the key role of Vitamin D in the uptake of calcium.

(c) Although there were a variety of incorrect answers given, most candidates generally scored both of the available marks.

Question 3

(a) Candidates were usually able to list features visible in Fig. 3.1 to show that both are insects. Common errors included reference to 'legs' (without defining number), to 'three segments', and to presence of 'antennae' or 'feelers'.

(b) Most candidates were able to score well in this question, correctly explaining that mosquito saliva spreads disease to humans through biting or sucking blood and that the housefly does so via human food.

Question 4

(a) This question required candidates to perform a simple calculation to show water loss in urine and enter their answer into Table 4.1. The majority of candidates were able to calculate the correct answer of *1500*.

(b) Whilst most candidates correctly identified sweat/500 as the correct answer, not all also named lungs/400 thereby missing one of the two available marks. The most common error was to choose urine/1500.

(c) Whilst the majority of candidates had no difficulty with this question, Centres should note that *diarrhoea* is not a disease but a sign of a disease.

Question 5

(a) **(ii)** and **(iv)** were answered well. However, in **(i)** the Examiner was disappointed that the majority of candidates did not realise that the plant was placed in the dark for 48 hours in order to de-starch and instead made vague references to prevention of photosynthesis. Answers to **(iii)** were wide ranging but often vague.

(b) Some candidates found this question challenging and so gave confused answers. However, many candidates scored both of the available marks.

Question 6

In general, this question was well answered with many candidates scoring all six of the available marks. The most common error was *bacterium* named as the causative organism of bilharzia.

Question 7

(a) This question was answered well, with the majority of candidates correctly plotting and joining up the points, then labelling the line, so scoring full marks.

(b) Nearly all candidates gained one mark for stating that addition of fluoride reduces tooth decay. However, relatively few made further reference to the effect over the age range shown (8 to 13) and so missed the second available mark.

(c) Most candidates correctly named enamel/crown and scored the available mark. Answers such as dentine or pulp cavity were not credited.

Question 8

(a) This question was generally answered well. Four clear contrasts were looked for, with two marks available for each of the contrasts given. The Examiner did not credit a simple list of examples of nervous and hormonal control, with no attempt to point out differences.

(b) Candidates were expected to include in their answers details of the respective roles of insulin, glucagon and adrenaline in the regulation process. A pleasing number of candidates gave full and correct accounts and often scored all seven of the available marks. Less able candidates often show lack of knowledge or confusion over aspects of regulation e.g. glucagon/glycogen, action of insulin/glucagon, hormones produced in liver (instead of pancreas). Some candidates did not mention that insulin/glucagon travel in blood from the site of synthesis to the site of action. The role of adrenaline was rarely mentioned, even by more able candidates.

Question 9

Overall, the general standard of response to both **(a)** and **(b)** was pleasing, with many candidates scoring their highest mark in Section B on this question.

(a) Many candidates scored well on this question. However, some candidates correctly described the formation of a blood clot but did not then explain the relevance of the clot in prevention of pathogens entering the body and causing disease. Good descriptions of lymphocytes and phagocytes and their respective roles were frequently seen. A minority of candidates correctly named these two types of white blood cell but then confused their mode of action e.g. 'lymphoctyes engulf bacteria' or 'phagocytes produce antibodies'. Some simply stated that lymphocytes/phagocytes kill pathogens/bacteria without providing details of how this is achieved. Memory cells seldom appeared in answers, even those of stronger candidates.

(b) It was pleasing to see that many candidates gave full answers and scored well on this question. However, a common error was a lack of detail about each of the types of substance, for example, not distinguishing clearly between the modes of action and sites of use of disinfectants and antiseptics. Some candidates were unsure about the action of antibiotics, stating that they were effective against viruses.

Question 10(Either)

Approximately 60% of candidates chose this option for Question **10**. Overall, the standard of answers to this question was mixed. Most candidates scored more highly on **(c)**, whilst for many candidates **(b)** was a case of "all or nothing".

(a) Many candidates found it difficult to score highly on this question. Answers were generally disappointing with a lack of understanding and confusion fairly commonplace.

(b) Candidates fell into two clear groups, namely those who understood the basics of genetics and those who did not. Many occasionally missed a significant point of detail such as not identifying in **(i)** the genotype *ff* as being the child affected by cystic fibrosis.

(c) Most candidates scored at least three of the available five marks. The answers from weaker candidates were usually characterised by lack of detail or sketchy detail. Some candidates mistakenly thought that the pill prevented fertilisation rather than ovulation, whilst others confused the cap with an IUD. Imprecise descriptions of the location of the cap, e.g. in the vagina rather than covering the cervix, were not credited.

Question 10(Or)

Approximately 40% of candidates chose this option for Question **10**. Overall the general standard of answer to this question was mixed. For most candidates, the standards of their answers to **(a)**, **(b)** and **(c)** were comparable.

(a) More able candidates gave full and relevant answers and often scored all four of the available marks. Some weaker candidates showed a lack of understanding and frequently confused the terms *meiosis* and *mitosis*.

(b) Many candidates were able to correctly state the genotypes of individuals **J**,**L**,**M**,**N** and **R** and so were able to score five of the available six marks, but a large proportion did not realise that individual **R** could be either *PP* or *Pp* and thus failed to score the sixth mark. A minority gave a variety of incorrect genotypes for all of the individuals.

(c) This question was generally answered well, with most gaining three or four of the available six marks and some scoring full marks. Weaker candidates frequently did not provide sufficient correct detail in their answers, especially with regard to vasectomy, e.g. not correctly identifying the vas deferens/sperm duct as the vessel cut. Many believed that vasectomy stopped the production of sperm rather than prevented the passage of sperm. Some candidates described vasectomy as taking place in the female rather than the male.