

# HUMAN AND SOCIAL BIOLOGY

**Paper 5096/12**  
**Paper 1 Multiple Choice**

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

## General comments

This is the last May/June examination offered in Human and Social Biology, 5096.

Candidates continued to demonstrate a good knowledge and understanding of the subject. Questions 14, 19, 26 and 30 were particularly well answered. There was a good spread of marks across the candidature.

## Comments on specific questions.

### Question 17

The distractor **A** was a popular choice. This may have been because candidates are taught that the carbon dioxide in expired air stimulates the rate of breathing in mouth-to-mouth resuscitation. However, this stimulation requires the carbon dioxide to enter the blood first.

**Question 30**

This question was answered correctly by most candidates, perhaps because of the general public awareness of the local situation in the locality that results in candidates being extremely knowledgeable about AIDS.

**Question 38**

This question required a value judgement to be made that well water will be safer to drink than water from a river or lake. Although this is generally true, occasionally well water does become contaminated and this may have confused some candidates.

**Question 39**

All the answer options for this question may present some slight truth. Candidates should have taken note that the question asks for the 'main' reason water storage tanks are covered. The prevention of access by organisms is far more important than the very minor effects of evaporation, temperature control and possibly chlorine loss.

# HUMAN AND SOCIAL BIOLOGY

**Paper 5096/13**  
**Paper 1 Multiple Choice**

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

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## Comments on specific questions.

### Page 2

#### Question 9

Beef will contain less carbohydrate than bananas or beans. Since this is only testing basic recall of a generally well known food fact, the question may have been misread.

**Question 20**

A number of variables must be considered to obtain the answer and this proved challenging. When an elastic band (the equivalent of the biceps muscle) contracts, the movement at the end (the hand) will be large and fast, while near the hinge movement will be small and slow. If a candidate observed their arm when they bent it, they could have obtained the answer.

# HUMAN AND SOCIAL BIOLOGY

Paper 5096/22

Paper 2 Theory

## Key Messages

Read the questions carefully and answer the question asked.

## General Comments

Most candidates were able to complete all sections of the paper; the time allocation for the paper was appropriate. However, some candidates did not answer all sections of the paper.

A very small number of candidates did not follow the rubric for **Section C** and answered both **Question 8** and **Question 9**. Almost all candidates answered **Questions 6** and **7**.

## Comments on Specific Questions

### **Section A**

#### **Question 1**

This question is about the kidney and water balance.

- (a) (i) Candidates were asked to label three areas on a longitudinal section of a kidney. Many scored all three marks. Those who scored less usually labelled the medulla as the cortex or pelvis. Some candidates labelled the outer layer (already labelled outer capsule) as the cortex. The ureter and pelvis labels needed to be clear and not confused with each other.
- (ii) The renal artery and renal vein were the tubes wanted here and many candidates scored both marks. Some labelled them as the hepatic artery and vein.
- (b) This question wanted to know why protein and glucose are absent from the urine. Many candidates did not appreciate that the protein molecules are too big to be filtered. Glucose is totally reabsorbed; however, some candidates stated that it was reabsorbed back into the filtrate.
- (c) (i) Candidates were given data about an investigation of water gains and losses from the body and asked to predict what would happen in a slightly different scenario. This was high scoring with many candidates scoring 2 or more marks.
- (ii) When asked to explain their reasons for their answers to (c)(i), candidates mainly repeated the question by stating more / less respiration or more / less sweating. The question asks for the *explanation*, not just a description.
- (d) ADH is the hormone that regulates the water content of the body. Candidates who knew this gave good answers about how it acts on the kidney. However, there were many different hormones cited. Some candidates could correctly name ADH, but not describe how it acts.

#### **Question 2**

This question is about specialised cells and was well answered.

### Question 3

This question is about the heart and circulation in a fetus.

- (a) In labelling the parts of the heart, there was sometimes confusion between the aorta and pulmonary artery.
- (b) Suggesting why the non-closure of vessel P had serious consequences for sufferers, proved challenging for candidates. Most scored 1 mark for the idea that the oxygenated and deoxygenated blood would mix. Few realised that blood would pass from the aorta to pulmonary artery because of the higher pressure in the aorta. Some scored marks by stating that less oxygen would go to the tissues.

### Question 4

This question is about scientific investigation and how data is shown and used.

- (a) The correct range most commonly given was 160 – 229. A common wrong answer was 9.
- (b)(i) The correct answer to the number of candidates taking part in the investigation was 150.
- (ii) The calculation of the frequency of the candidates who had a hand-span between 190 and 199 gave the answer 30%. Many candidates obtained this, or the alternative figure of 29.7%.
- (c) Candidates were asked to complete the chart by drawing the two missing results.
- (d) In this question, candidates were asked to suggest reasons why the hand-spans varied so much. This was not asking about experimental detail, but underlying reasons, e.g. different ages / sexes / diets, etc.

### Question 5

This question is about hormonal and nervous control.

- (a) The definition of a hormone was required for this question. Many candidates needed to give both parts of the definition to score full marks.
- (b)(i) Candidates were given data on the production of gastric juice in the stomach. They were asked to *describe* (not explain) the differences in the production of gastric juice in response to the two types of stimulation. A simple comparative description was needed. Candidates found this difficult.
- (ii) When asked why gastric juice stops being produced 4.5 hours after the meal, few candidates realised that the stomach would be empty as the food had moved on into the duodenum. Many stated that digestion was complete.
- (c) This question needed an outline of a simple reflex. Candidates did not score well as they only repeated the information given in the question. Many did not attempt this question.
- (d) The transmission of the nerve impulse from one neurone to another is by chemical means across a synapse. Candidates needed to correctly describe the diffusion of the chemical neurotransmitter. Some candidates did not attempt an answer.

## Section B

### Question 6

This question is about identification of organisms, particularly some that are disease causing, and the role of blood in the defence of the body.

- (a) Candidates were given some characteristic features of organisms and the names of some groups and asked to match them together.

- (b) Three ways in which the blood defends the body against disease causing organisms were asked for. Candidates usually wrote about the clotting of blood, but their descriptions of antibody production and phagocytosis often needed to be clearer to gain credit.
- (c) This was a simple recall question about the causal organism, the method of spread and the control of three diseases, cholera, influenza and tuberculosis. This was answered well by most candidates, however, some confused the method of control with how a sufferer was treated.

### Question 7

This question is about breathing (and respiration).

- (a) Candidates were asked about the difference between the two. Breathing is ventilation of the lung surface whereas respiration is the release of energy in cells. This was not well understood.
- (b) This question needed a description of the action of the diaphragm, ribs and intercostal muscles during inspiration. Some candidates confused the action of the two sets of intercostal muscles.
- (c)(i) The cleaning of the inspired air was asked for in this question. Mucus production and its removal by cilia were needed.
- (ii) This was the best answered of the **section (c)** questions as many candidates knew that smoking causes the cilia to stop moving and more mucus to be produced.
- (iii) This question wanted information on the long-term effects of cigarette smoke on the lungs. Although most candidates could name several diseases that people would suffer from, few wrote about the way these diseases developed; details of, for example, mucus draining into the lungs because it is not being removed, or less efficient gas exchange, were required.

### Section C

#### Question 8

This question is about the nitrogen cycle and eutrophication. Generally, candidates found it challenging.

- (a) This question wanted a simple description of the nitrogen cycle.
- (b) A description of the undesirable effects of eutrophication was needed.

#### Question 9

This question is about nutrients needed by a human body.

- (a)(i) This question asked for three nutrient groups required by the body in *large* quantities. Some candidates did not take note of the question stem and gave *any* three nutrient groups. The groups wanted were carbohydrates, proteins and fats/lipids.
- (ii) The answers to (a)(i) were then used to answer (a)(ii). It asked for the uses of these nutrient groups.
- (b)(i) This question asked for three nutrient groups required by the body in *small* quantities. Again, some candidates did not take note of the question stem and cited any three nutrient groups. The answers wanted were vitamins and minerals. Named examples were also credited.
- (ii) This question asked for the name of an example of each group in (b)(i) and a use.
- (c) Water is essential in the diet and this question wanted two functions described.

# HUMAN AND SOCIAL BIOLOGY

Paper 5096/23

Paper 2 Theory

## Key Messages

Read the questions carefully and answer the question asked.

## General Comments

Most candidates were able to complete all sections; the time allocation for the paper was appropriate.

## Comments on Specific Questions

### **Section A**

#### **Question 1**

This question is about skin and sweating.

- (a) (i) The labels on the skin were well known.
- (ii) The capillaries are the place where the highest temperature is found because blood is diverted here so that heat can be lost from it.
- (b) (i) Candidates were asked to calculate the increase in the rate of sweat production.
- (ii) This question required a description of what happens in the skin when exercising; vasodilation, in particular. It is important to remember that blood flows to the skin all the time and when heat needs to be lost *more* blood flows to the skin.
- (iii) This question sought an explanation of why the changes in (b)(ii) are necessary. Some incorrect answers cited enzymes dying and arteries dilating.
- (c) (i) The question asked for four conclusions from the results of the investigation in different conditions. These conditions were air temperature, clothing and weight carried. Candidates needed to take note of the different conditions when writing their answer.
- (ii) Explanations were required for two of the four conclusions for this question. Those candidates who answered (i) correctly scored well in this section. Other candidates merely repeated the answers given in (i).

#### **Question 2**

This question is about biological processes. Five processes were described and the candidates were asked to choose names for each of them. This was a high scoring question.



### Question 3

This question is about heart rate.

- (a) Some candidates did not appreciate that *more* energy and *more* oxygen are needed during exercise.
- (b)(i) After being given some data on recommended maximum heart rate during exercise, candidates were asked why these figures should not be exceeded. This is so that the heart is not stressed.
  - (ii) A calculation of maximum heart rate for people aged 20 years was needed for this question. Most candidates calculated the answer (200bpm) correctly.
- (c)(i) In this question, candidates had to plot two points to finish the plotting, and then complete the line which was a straight line.
  - (ii) All candidates extrapolated the line to correctly predict the heart rate for people aged 90 years.
  - (iii) Candidates had to give a description to the effect that the straight line in (c)(i) showed a direct negative correlation.

### Question 4

This question is about eyes.

- (a)(i) Candidates had to state the *visible* change between the two pictures.
  - (ii) This question required candidates to suggest why the pupil had changed size. Those who got it incorrect usually thought that it was looking at nearby or distant objects.
  - (iii) In this question, candidates had to explain what was happening in the eye, namely, that the retina had detected a change in light intensity and the circular and radial muscles had responded appropriately.
- (b) This last question asked how the lens changes when looking at a nearby object. Those candidates who scored well in earlier parts of the question also scored both marks here.

### Question 5

This question is about inspired and expired air. Candidates scored well on both parts.

- (a) Firstly, the question asked how inspired and expired air differ from each other.
- (b) Secondly, with a table of data, candidates had to deduce two effects on breathing of increasing the concentration of carbon dioxide in inspired air.

### Question 6

This question is about osmosis.

- (a)(i) Candidates were given a diagram of some apparatus and asked to explain fully why the level of the liquid went up after 10 minutes. Candidates recognised that osmosis was happening, but needed to make more precise points when describing how and why the process occurs.
  - (ii) Explaining why the level of the solution in the tube decreased between 10 and 30 minutes was a challenging question. Candidates had to deduce that osmosis and diffusion of glucose must be happening in both directions, with the net effect of the level of liquid in the tube and beaker becoming equal.

## Section A

### Question 7

This question is about characteristics of living organisms and enzymes.

- (a) Many candidates needed to learn the seven characteristics of living organisms in order to score more highly on this straight forward, recall question.
- (b)(i) The definition of an enzyme was required for this question. Where questions requiring definitions carry two marks, candidates must remember to include two points in their answers.
- (ii) This question required candidates to describe the effect that changing the temperature and pH have on the activity of an enzyme. There were 3 marks for each description. Some candidates' answers needed to be less vague in order to gain these marks. Temperature required a description of denaturation at high temperatures and inactivity at low temperatures. pH required a description of less enzyme activity above and below the optimum.

### Question 8

This question is about carbohydrates, namely photosynthesis in plants and digestion of carbohydrates in the alimentary canal.

- (a) This question was well answered.
- (b) Candidates scored highly for their descriptions of the digestion of carbohydrates in the alimentary canal.
- (c) Another well answered question with a few candidates stating (re)absorption instead of active transport along with diffusion.

## Section C

### Question 9

This question is about the circulatory system and blood.

- (a)(i) Stating the components of blood presented no problem for candidates.
- (ii) Candidates scored high marks for knowing the functions of the blood components they had named.
- (b) This question asked candidates to describe the function of valves. The answer needed precise statements of valve positions, e.g. between the left atrium and the left ventricle, or the *base* of the pulmonary artery.

### Question 10

This question was not chosen by candidates.