CAMBRIDGE TECHNICALS

OCR
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CAMBRIDGE TECHNICALS LEVEL 3 (2016)

Examiners' report

HEALTH AND SOCIAL CARE

05830–05833, 05871

Unit 4 January 2022 series

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Contents

Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

Where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.

A full copy of the question paper and the mark scheme can be downloaded from OCR.

Unit 4 series overview

This examination series saw a slight reduction in the overall level of response in comparison to more recent series. There was a decrease in the number of candidates who were able to access all questions. Many candidates used the additional pages to continue their responses, with most indicating that they had done so. There was clear evidence that there was sufficient time to complete the paper.

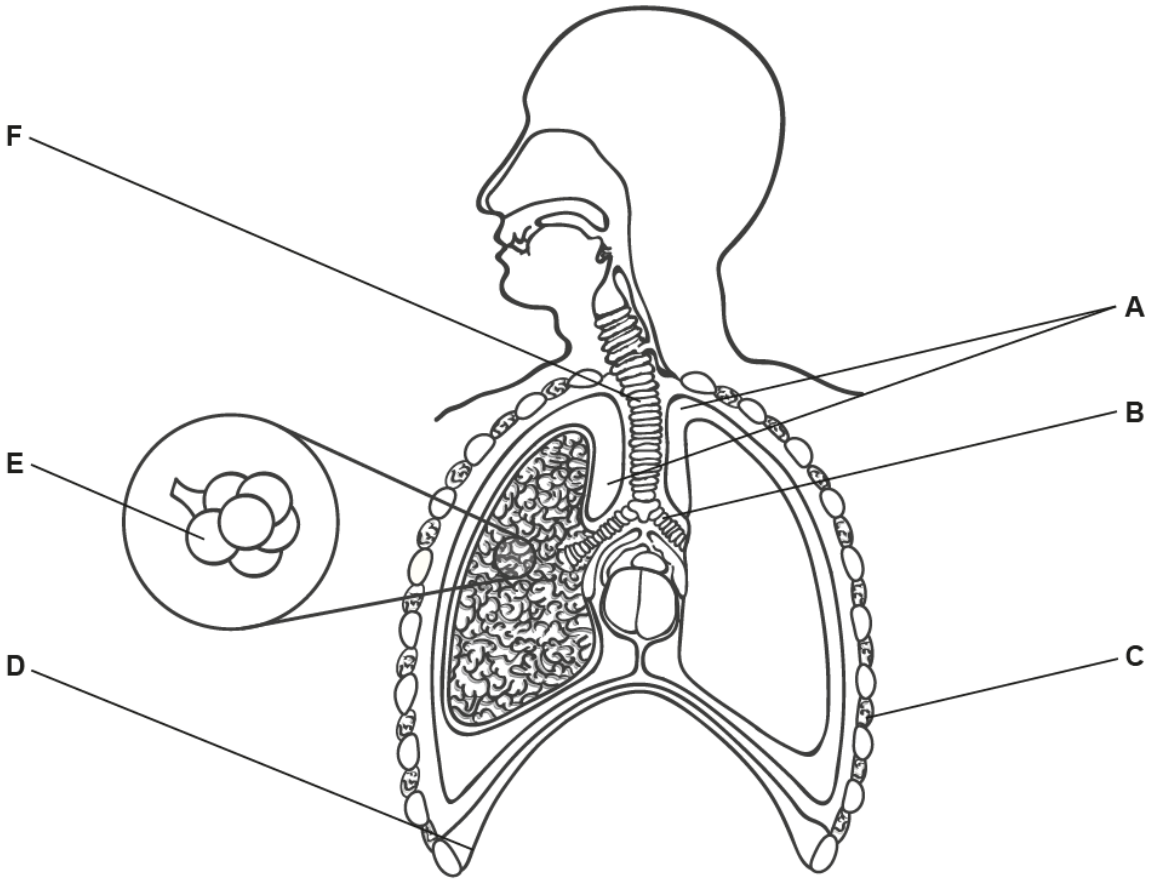
As with previous exam series the point-based questions were accessible by the majority of candidates, with most gaining a high percentage of correct marks.

When compared to the most recent exam series fewer candidates provided Level 3 responses. There was evidence that candidates clearly understood the impact of disease on lifestyle, however many did not demonstrate knowledge of the biology of diseases. The evaluation question (Question 3(c)) on diabetes treatment and lifestyle changes was only answered well by a small number of candidates. Many candidates did not evaluate either treatment or lifestyle changes, and of those that did the responses were often one-sided, either focussing on positives or negatives.

Candidates who did well on this paper generally did the following:	***Candidates who did less well on this paper generally did the following:***
• Answered all questions. • Achieved a high percentage of the point-based questions. • Provided Level 2 or Level 3 responses on the Level of response (LOR) questions. • Addressed all parts of LOR questions e.g., discuss the biological causes and effects of cirrhosis.	• Didn't answer all questions. • Left options blank on the point-based questions e.g., gap fills, true or false and tick box questions. • Repeat a lot of the information from the question in their answer.

Question 1 (a) (i)

1 The diagram below shows the structure of the respiratory system.



(a) (i) Complete the table below using letters from the diagram.

The last row has been done for you.

Structure	Letter
Alveolus	.....
Bronchus	.....
Diaphragm	.....
Intercostal muscle	.....
Pleural cavity	**A**

[4]

This question was answered well, with most candidates achieving full marks. The most common incorrect answer was F for Bronchus.

Question 1 (a) (ii)

(a) (ii) The pleural cavity contains fluid for lubrication which allows the lungs to move easily.

Choose **two** other structures from the table in **1(a)(i)** and describe their function.

Structure .....

Function .....

.....

[1]

Structure .....

Function .....

.....

[1]

Performance on this question was mixed. Many candidates gave vague or confused responses e.g., "diaphragm moves up when you breathe in" or "intercostal muscles protect the lungs". Some candidates selected the structure from the diagram rather than those listed in the table and so received no credit. The most common correct answer was describing the role of the alveoli in gaseous exchange.

Question 1 (b)

(b)* Cellular respiration is a set of reactions that takes place inside cells to provide energy.

There are two types of cellular respiration:

- Aerobic respiration
- Anaerobic respiration

Compare aerobic and anaerobic respiration.

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.....

.....

..... **[6]**

Most candidates were able to access this question, with them often achieving credit for covering oxygen, ATP and waste products. However, very few candidates achieved full marks, with the location (mitochondria or cytoplasm) being the most common omission. Most candidates did compare the two types of respiration, showing an understanding of the command verb. Some candidates did mix up the processes, for example saying oxygen is required for anaerobic respiration.

Question 1 (c) (i)

(c) Alex, 10, has cystic fibrosis. There is no cure for cystic fibrosis, but Alex has regular hospital appointments to receive support and advice that helps him manage his condition.

(i) Describe the biological cause of cystic fibrosis.

.....

.....

.....

..... **[2]**

Most candidates achieved 1 mark on this question, but very few achieved 2 marks. This was because they either focused on the genetic causes or the thick/sticky mucus, but rarely both. Some candidates were a little vague saying there was too much mucus, without stating it was thick or sticky.

Question 1 (c) (ii)

(ii) Identify **one** effect of cystic fibrosis on the respiratory system.

.....

..... **[1]**

This was a well answered question, with marks commonly given for making the link to breathing difficulties. Several candidates focused on thick mucus rather than the effects that this mucus has on the respiratory system.

Question 1 (c) (iii)

(iii) Suggest **one** way of helping Alex manage his condition.

.....

..... **[1]**

Well answered with physiotherapy, inhalers and exercise the most common correct responses.

Question 1 (d)

(d) As well as affecting the respiratory system, cystic fibrosis may also affect liver function.

Complete the table below by deciding whether each statement about functions of the liver is True **(T)** or False **(F)**.

Statement	True or False
The liver breaks down alcohol by a process called deamination.	.....
The liver produces bile.	.....
The liver produces the toxic waste, urea.	.....
The liver stores vitamins.	.....

[4]

Very few candidates achieved all 4 marks available for this question, with the last option "the liver stores vitamins" being the most common incorrect response. Most candidates achieved 1 to 3 marks, with only a small minority achieving no marks.

Question 1 (e)

(e)* Cirrhosis is a disease of the liver.

Discuss the biological causes of cirrhosis and the possible effects of cirrhosis on the body.

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..... **[6]**

The terms "causes" and "effects" are both pleural, meaning candidates needed to discuss at least two causes and two effects on the body. Very few candidates did this. With regards to causes, most candidates identified alcohol, with a high percentage going on to discuss the development of scar tissue. Other causes were less detailed, with candidates mentioning a term e.g., haemochromatosis, with no explanation.

Question 2 (a)

2 The eye is part of the sensory system.

(a) Complete the passage about the structure and function of the eye by choosing the most appropriate word(s) from the list below.

ciliary muscle	**conjunctiva**	**humours**	**iris**	**lens**
macula	**optic nerve**	**pupil**	**retina**	

The front of the eye is covered by the ..... , a thin membrane that protects the surface. Light enters the eye through the cornea and passes through the opening in the middle of the eye called the ..... . The amount of light that enters the eye is controlled by the ..... and light is focussed on the retina by the ..... which can change shape. The ..... is the part of the retina which has many photoreceptor cells that help to produce a detailed image. The image is converted into electrical impulses which are carried to the brain by the ..... .

[6]

Responses to this question were mixed. A reasonable number of candidates achieved full marks, but 2 to 4 marks was the most common range of marks. Conjunctiva was the least well identified answer and optic nerve was the most common correct answer.

Question 2 (b) (i)

(b) There are many malfunctions of the eye. One of these affects the lens causing blurred or cloudy vision.

(i) Identify **this** eye malfunction.

..... **[1]**

Most candidates correctly identified cataracts, although there was an array of spellings. Glaucoma was the most common incorrect answer. Some candidates offered responses that are not on the specification including short-sightedness, blindness and colour blind.

Question 2 (b) (ii)

(ii)* There are several different treatments available for different eye malfunctions.

Identify **one** malfunction of the eye and explain the treatment for it.

You may use the malfunction identified in **(b)(i)** or another of your choice.

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.....

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.....

.....

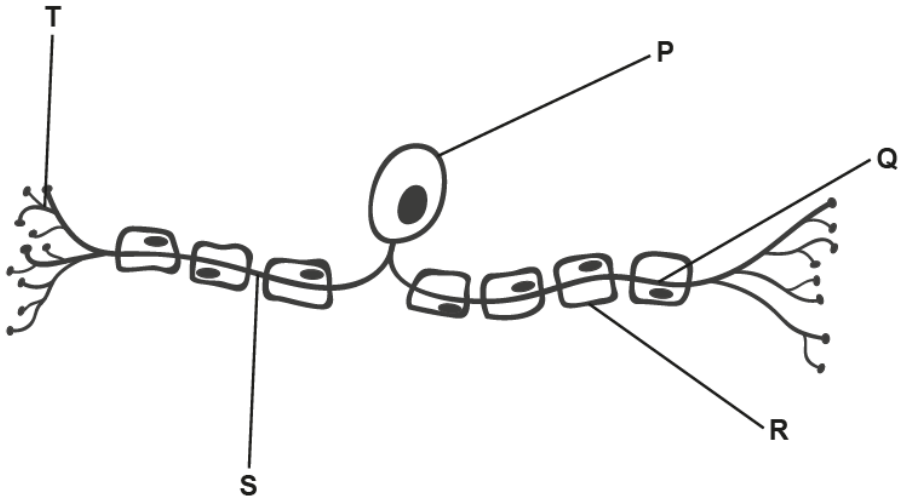
..... **[6]**

Most candidates, stayed with the theme and answered the question on cataracts. For those who didn't glaucoma was the most frequent disease selected. Candidates need to be aware that to achieve Level 3 on an 'explain' questions it is not sufficient to simply state treatment with no detail provided. For example, many candidates' responses were "replace the lens with a new one". To achieve Level 3 candidates would need to provide more detail, for example explaining how the procedure is performed.

Question 2 (c) (i)

(c) Sensory neurons transmit electrical impulses from sensory organs such as the ear to the brain.

The diagram below shows the basic structure of a sensory neuron.



(i) Complete the table below using letters from the diagram to identify the components of the sensory neuron.

Structure	Letter
Axon	.....
Cell body	.....
Myelin sheath	.....
Node of Ranvier	.....

[4]

This was a less well answered question, with a variety of responses and marks. Cell body was the most frequent correct answer and Node of Ranvier the most common incorrectly identified.

Question 2 (c) (ii)

(ii) When an electrical impulse gets to the end of the sensory neuron it must cross a gap to pass on to the next sensory neuron.

Name the gap between sensory neurons.

..... **[1]**

This was a well answered question.

Question 2 (d) (i)

(d) The musculoskeletal system contains joints which occur where two or more bones come together such as the fixed joint.

(i) Identify **one** other type of joint found in the body.

..... **[1]**

Again, a well answered question, with hinge the most common answer. Common incorrect responses included synovial joint and vague answers like ball joint.

Question 2 (d) (ii)

(ii)* Explain how the action of muscles around the joint identified in **2(d)(i)** results in movement.

.....

.....

.....

.....

.....

..... **[6]**

Most candidates achieved a Level 2 response on this question, in which they explained that muscle worked in antagonistic pairs and using an example (biceps and triceps) to illustrate. Very few candidates went on to fully explain about agonists and antagonists within their explanations.

?	**Misconception**	Many candidates focused on describing movements, without using the terminology of the specification e.g., agonist and antagonist.

Question 2 (e)

(e) Complete the table below by deciding whether each statement about malfunctions of the musculoskeletal system is True **(T)** or False **(F)**.

Statement	True or False
Bone density scans are used to monitor osteoporosis.	.....
Osteoarthritis can be caused by injury to a joint.	.....
Osteoporosis can be caused by loss of cartilage in joints.	.....

[3]

This was a well answered question, with most candidates achieving at least 2 marks. The final statement was the most frequent incorrect answer.

Question 3 (a)

3 (a)* Homeostasis is important in regulating conditions in the body.

The statements below are examples of homeostasis.

- Keeping the water content of cells constant
- Controlling the concentration of glucose in the blood
- Maintaining the body temperature at 37 °C

Explain the principles of homeostasis. You can either use **one** of the examples above or another example you have studied.

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.....

..... **[6]**

Most candidates struggled with this question, only achieving Level 1 responses. They often included the information within the question that gained them no credit. Very few candidates referred to negative feedback mechanisms. There were some excellent answers which in the main were based around body temperature control or blood glucose. These answers addressed mechanisms for levels going too high or low.

?	**Misconception**	Some candidates focused on the effects of not maintaining homeostasis e.g., cells becoming denatured due to high body temperature. The question required explanation of homeostatic mechanisms e.g., negative feedback and vasodilation of blood vessels to lower body temperature.

Question 3 (b) (i) – (iv)

(b) Malfunctions can occur that affect the control and regulatory systems of the body.

Choose from the list of malfunctions below to answer the following questions.

You can use each malfunction once, more than once or not at all.

diabetes	**stroke**
multiple sclerosis	**nephrotic syndrome**

(i) Name **one** malfunction that can be caused by damage to the kidneys.

..... **[1]**

(ii) Name **one** malfunction that can be caused by high blood pressure.

..... **[1]**

(iii) Name **two** malfunctions with symptoms that include loss of balance and coordination.

1 .....

2 .....

[2]

(iv) Name **one** malfunction that is an autoimmune disease.

..... **[1]**

Most candidates answered these sets of questions well. Diabetes was the most common incorrect response for Questions 3(b)(i) and 3(b)(ii). Question 3(b)(iii) was well answered by nearly all candidates. Nephrotic syndrome was frequently given as a wrong answer for Question 3(b)(iv). Some candidates gave responses that were not included within the question, and so were not creditable. Candidates should be aware that when options are provided within the question, that only these should be given as answers.

Question 3 (c)

(c)* There are two types of diabetes, Type 1 and Type 2.

Evaluate the possible treatments, including any lifestyle changes that are available for diabetes.

.....

.....

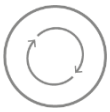
.....

.....

.....

..... **[8]**

Very few candidates evaluated treatments and lifestyle changes. Those that did, provided high quality answers showing advanced knowledge and understanding. Many candidates explained treatments and lifestyle changes, but often they did not evaluate them or only considered positives or negatives. Some candidates discussed monitoring blood glucose through fingerprick tests. This was correct if linked as a negative to insulin injections. But if not linked it was not creditable.

	**AfL**	When teaching treatments and lifestyle changes for any disease, it is recommended that the strengths and weaknesses are covered.

Question 4 (a)

4 The heart is part of the cardiovascular system.

(a) Complete the passage about the structure of the heart by choosing the most appropriate word(s) from the list below.

You can use each word once, more than once, or not at all.

aorta	**artery**	**atrium**	**bicuspid**	**semi-lunar**
tricuspid	**vein**	**vena cava**	**ventricle**	

The heart consists of four chambers. Blood enters the right side of the heart through a blood vessel called the ..... and leaves the heart to go to the lungs via the pulmonary ..... . The valve between the two chambers on the right side of the heart is called the ..... valve and prevents backflow of blood into the right ..... . After it has been oxygenated in the lungs, blood returns to the heart and is pumped out of the main blood vessel called the ..... to the rest of the body.

[5]

There was a large variation in response by candidates. A reasonable amount achieved 5 marks, indicating clear knowledge about the flow of blood through the heart. 4 marks was the most common score, with artery and atrium being the most frequent incorrect answers. Some candidates chose to leave gaps blank, they should be encouraged to attempt questions like these.

Question 4 (b)

(b) The cardiac cycle is controlled by electrical activity in the heart.

Which statement about the control of the cardiac cycle is correct?

Put a tick (✓) in the box next to the correct statement.

The atrioventricular node (AVN) is known as the pacemaker.	☐
The atrioventricular node (AVN) delays the electrical impulse.	☐
The Purkyne fibres pass the electrical impulse from the atria to the ventricles.	☐
The sinoatrial node (SAN) receives the impulse from the atrioventricular node (AVN).	☐

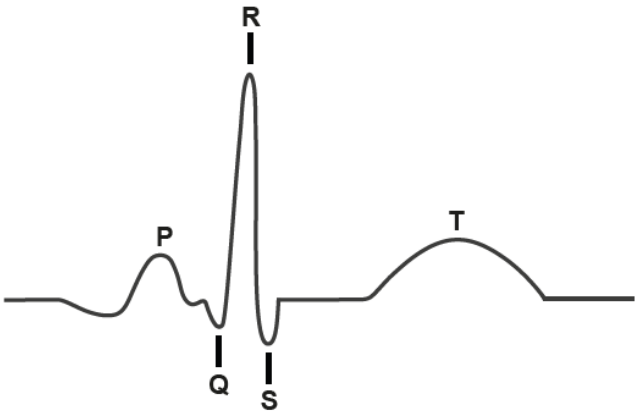
[1]

Most candidates got this question wrong, with "AVN is known as the pacemaker" the most common incorrect answer. Some candidates ticked more than one box, resulting in no credit, even if the correct box was ticked.

Question 4 (c) (i) – (iii)

(c) An electrocardiogram (ECG) shows the electrical activity in the heart during the cardiac cycle.

The diagram below shows the ECG trace of a healthy heart with waves **P**, **Q**, **R**, **S** and **T** labelled.



Use the letters in the diagram to identify the part of the ECG trace where the following are happening inside the heart.

Each letter may be used once, more than once, or not at all.

(i) The ventricles are relaxing.

..... **[1]**

(ii) The atria are contracting.

..... **[1]**

(iii) The ventricles are contracting.

..... **[1]**

In this set of questions on ECG and electrical activity within the heart, candidates performed well overall, with most individuals achieving 2 or 3 marks. Question 4(c)(i) was the most frequent incorrect answer and Question 4(c)(iii) the most frequent correct answer.

Question 4 (d)

(d) As blood passes through capillaries, tissue fluid is formed. Fluid moves out of the blood at the arterial end of the capillary and some fluid drains back into the blood at the venous end.

Outline **two** roles of blood proteins and **two** roles of hydrostatic pressure in the movement of fluid into and out of blood capillaries.

Blood proteins:

1 .....

.....

2 .....

.....

Hydrostatic pressure:

1 .....

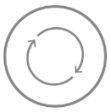
.....

2 .....

.....

[4]

Candidates found this question very challenging, with many leaving it blank. Only a small number of candidates achieved any marks on this question. Candidates had more knowledge of hydrostatic pressure, with some candidates outlining how it forces plasma through the capillary walls. Fibrinogen was a common incorrect answer for blood proteins. It is a blood protein, but not relevant to the movement of fluid in and out of capillaries.

	**AfL**	This is a technically difficult aspect of the specification. Breaking concepts down into steps can be beneficial in enhancing knowledge and understanding.

Question 5 (a)

5 The small intestine is a component of the digestive system.

(a) Choose **one** adaptation that does **not** help the intestine wall to absorb nutrients.

Adaptation	Tick (✓) the one that is **not** a correct adaptation.
It has a small surface area.	
It has lacteals.	
It has microvilli.	
It has villi.	

[1]

Overall this was a well answered question, with a high percentage correctly identifying that the small intestine does not have a small surface area. The most common incorrect answer was "it has lacteals".

Question 5 (b)

(b)* Ben, an active 35-year-old man, has recently been diagnosed with Coeliac disease.

Coeliac disease is a malfunction of the digestive system that prevents nutrients being absorbed correctly in the small intestine.

Discuss the symptoms of Coeliac disease and the impact it may have on Ben's lifestyle. **[8]**

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.....

This was the best answered LOR question, with many candidates addressing both aspects of the question well and gaining high Level 2 or Level 3 grades. To achieve a Level 3 response candidates needed to clearly link symptoms to impact on lifestyle and less candidates managed to do this.

Question 5 (c)

(c) Complete the table about components of the digestive system.

Use components from the list below.

You can use each component once, more than once or not at all.

buccal cavity	**large intestine**	**oesophagus**	**rectum**
salivary glands	**small intestine**	**stomach**	

Statement	Component
Links the large intestine to the anus.	.....
Produces fluid that makes food easy to swallow.	.....
Produces hydrochloric acid.	.....
Reabsorbs water and ions from digested food.	.....
Stores faeces.	.....

[5]

This was a well answered question with most candidates achieving 3 or 4 marks. The most common incorrect answer was thinking that the small intestine reabsorbs water and ions from digested food.

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