OCR
Oxford Cambridge and RSA

Monday 13 January 2025 – Afternoon

Level 3 Cambridge Technical in Health and Social Care

05831/05832/05833/05871 Unit 4: Anatomy and physiology for health and social care

Time allowed: 2 hours
C442/2501

No extra materials are needed.

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | | | Candidate number | | | | |

First name(s) ______________________

Last name ______________________

Date of birth | D | D | M | M | Y | Y | Y | Y |

INSTRUCTIONS
- Use black ink.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.

INFORMATION
- The total mark for this paper is **100**.
- The marks for each question are shown in brackets [ ].
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **20** pages.

ADVICE
- Read each question carefully before you start your answer.

1

(a) Structures of the digestive system have different functions.

(i) Some of the structures found in the digestive system are listed below.

buccal cavity **epiglottis** **oesophagus** **rectum**

salivary gland **small intestine** **stomach**

Complete the table about functions in digestion using the structures listed.

You may use each structure once, more than once or not at all. The first one has been done for you.

Function in digestion	**Structure**
Churns the food to help break it up and mix it with enzymes	stomach
Covers the opening of the trachea when swallowing to prevent food entering the lungs	....
Opening for food to be chewed and mixed with saliva	....
Produces hydrochloric acid to activate enzymes and kill bacteria	....
Squeezes swallowed food from the mouth into the digestive system	....

[4]

(ii) Mechanical digestion is a process that takes place in the digestive system.

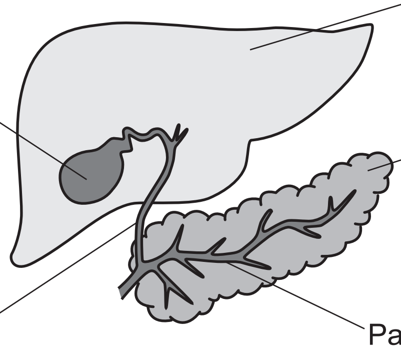
Which **one** of the following is an example of mechanical digestion?

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

Example	**Tick (✓) one only**
Enzymes in saliva digest food into smaller molecules.	
Food is chewed into smaller pieces by the teeth.	
Small food molecules are absorbed into the bloodstream.	

[1]

(b) The diagram below shows part of the digestive system.



Use the diagram to answer the following questions.

(i) Identify the organ that produces digestive enzymes.

.... **[1]**

(ii) Identify the organ that produces bile.

.... **[1]**

(iii) Identify the duct that releases a fluid that contains fat-digesting enzymes.

.... **[1]**

(c)* Ben has had symptoms associated with a malfunction of the digestive system.

An ultrasound scan has shown that they have developed gallstones. Describe possible symptoms and causes of Ben's gallstones.

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.... **[6]**

(d) Amir has been diagnosed with cirrhosis, a disease of the liver.

Amir has been told by their doctor that there is no cure for cirrhosis, but their symptoms can be managed.

(i) Explain **one** possible biological cause of cirrhosis.

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.... **[2]**

(ii)* Discuss the impact caused by the symptoms of cirrhosis on Amir's lifestyle and their likely care needs.

.... **[8]**

2 The eye is part of the sensory system.

(a) Complete the table below by deciding whether each statement about the function of structures in the eye is True (**T**) or False (**F**).

Statement	**True (T) or False (F)**
The optic nerve transmits impulses from the eye to the brain.	....
The pupil focuses light entering the eye.	....
The suspensory ligaments attach the lens to ciliary muscles.	....
The conjunctiva contains photoreceptors for detecting light.	....

[4]

(b) Malfunctions of the eye can affect different structures in the eye.

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

AMD **cataracts** **glaucoma** **retinopathy**

(i) Which malfunction results in cloudy patches developing in the lens?

.... **[1]**

(ii) Which malfunction results in a build-up of fluid in the eye?

.... **[1]**

(c)* Healthcare professionals can provide advice about the care needs of a person living with the impacts of an eye malfunction.

Explain the likely care needs of a person with an eye malfunction.

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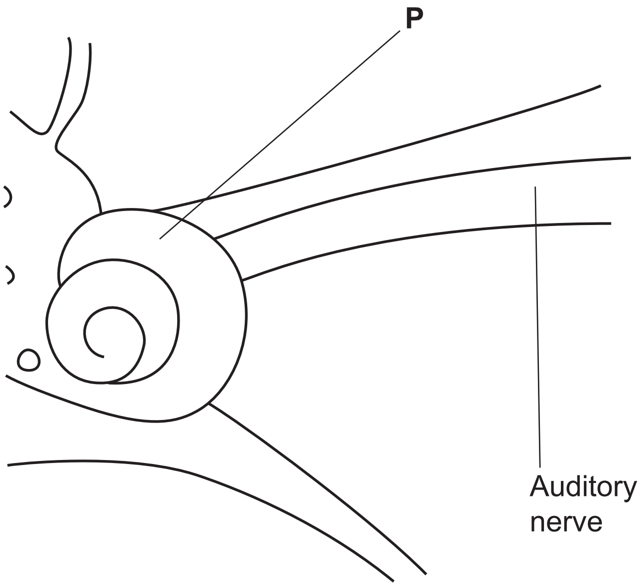
.... **[6]**

(d) The ear is also part of the sensory system.

The diagram shows a section of the ear.



(i) Which **one** of the following is the section of the ear shown in the diagram?

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

Section	**Tick (✓) one only**
Inner ear	
Middle ear	
Outer ear	

[1]

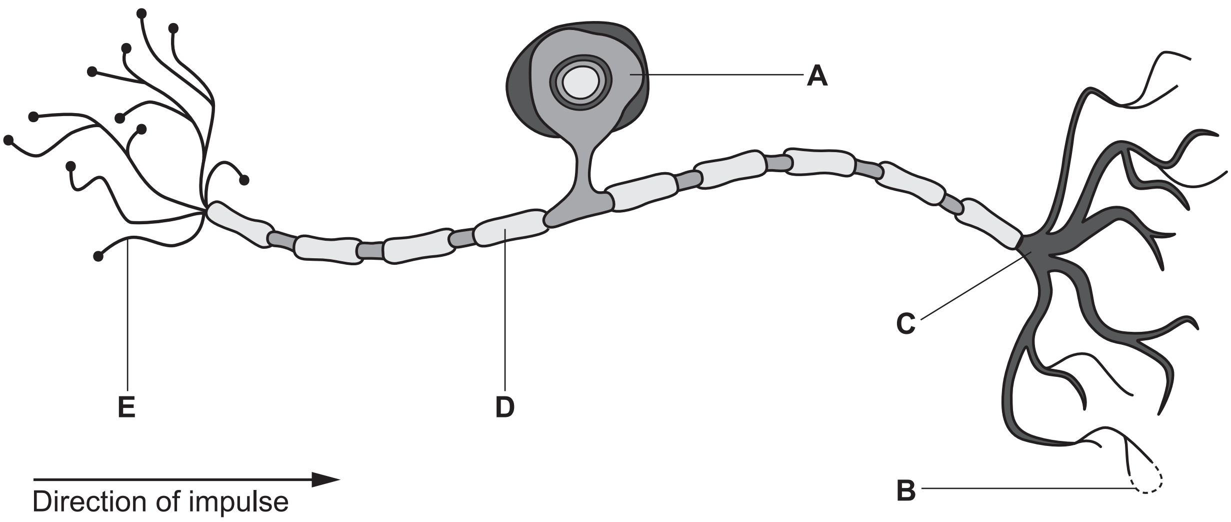
(ii) The structure labelled **P** contains an organ lined with tiny hair cells that converts sound vibrations into nerve impulses.

Name the organ located inside the structure labelled **P**.

.... **[1]**

(e) Sensory neurons transmit nerve impulses from receptors in the ear to the central nervous system.

The diagram shows a sensory neuron.



(i) Complete the table below by selecting the correct letter that identifies the structures labelled on the diagram.

Structure	Letter
Axon	....
Cell body	....
Dendrite	....
Myelin sheath	....

[4]

(ii) A synapse connects neurons allowing nerve impulses to cross from one neuron to the next.

Complete the sentences about synapses by choosing the most appropriate word(s) from the list below.

axons **dendrites** **hormones** **neurotransmitters** **receptors**

When a nerve impulse reaches the end of a neuron, ...

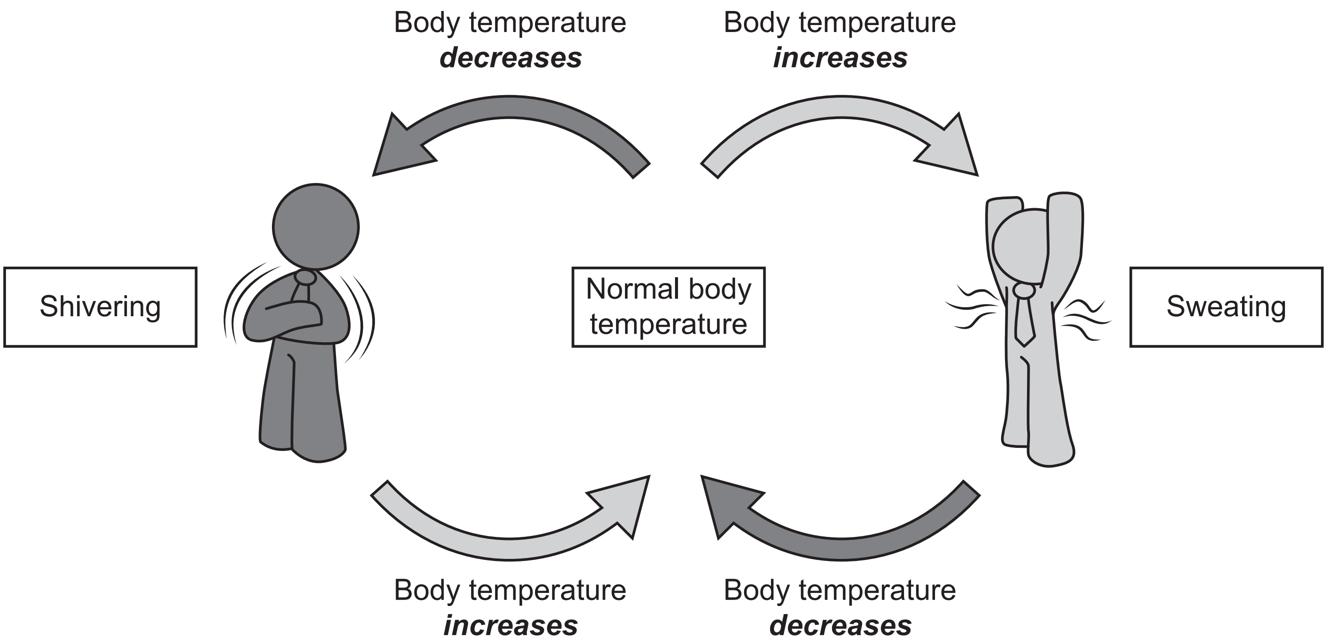
are released. These are chemicals that cross the synaptic gap to transmit the impulse.

The chemicals bind to the .... on the membrane of the next neuron.

The impulse is then transmitted through this neuron.

[2]

3 The diagram shows how a constant body temperature is maintained.



(a) Outline the process that enables the body to maintain a constant temperature.

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.... **[3]**

(b) Nina has diabetes. Their endocrine system is malfunctioning, and they cannot produce insulin.

(i) Name the organ in the endocrine system that produces insulin.

.... **[1]**

(ii) State what will happen to Nina's blood glucose levels if they cannot produce insulin.

.... **[1]**

(iii) State **three** symptoms of diabetes.

1 ....

2 ....

3 ....

[3]

(c)* Evaluate **three** treatments available to help Nina manage diabetes and reduce the impact on their lifestyle.

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.... **[8]**

(d) Gaseous exchange is a process that takes place in the respiratory system.

Complete the sentences about the structure of the respiratory system by choosing the most appropriate word(s) from the list below.

alveoli	**bronchi**	**bronchioles**	**diaphragm**
intercostal	**larynx**	**pleural**	**trachea**

The windpipe splits into two tubes called .... that enter each

lung. These two tubes divide further into many airways that end in small air sacs known as

.... During inspiration, the muscular

.... flattens and the ribcage is pulled upwards and

outwards by the action of the .... muscles.

This enables air to enter the lungs.

[4]

(e) Asthma is a malfunction of the respiratory system.

The symptoms of asthma include breathlessness, wheezing and tightness in the chest.

(i) Explain **one** possible biological cause for these symptoms.

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.... **[2]**

(ii)* Describe the impacts on lifestyle for a person suffering from asthma.

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.... **[6]**

4 Arteries and veins are blood vessels that transport blood in the cardiovascular system.

(a) Complete the table below by deciding whether each statement about these blood vessels is True (**T**) or False (**F**).

Statement	**True (T) or False (F)**
Arteries are blood vessels that carry blood away from the heart.	....
Both arteries and veins have valves to prevent blood flowing backwards.	....
Veins have thicker walls than arteries.	....

[3]

(b) The blood contains plasma proteins.

Which **one** of the following is a function of plasma proteins?

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

Function	**Tick (✓) one only**
Destroy bacteria	
Help form tissue fluid	
Transport oxygen	

[1]

(c) Coronary heart disease (CHD) is caused by a build-up of fatty deposits in part of the cardiovascular system.

(i) Name the part of the cardiovascular system where a build-up of fatty deposits occurs.

.... **[1]**

(ii) A diet high in cholesterol can increase the risk of developing CHD.

State **two other** lifestyle factors that can increase the risk of developing CHD.

1 ....

2 ....

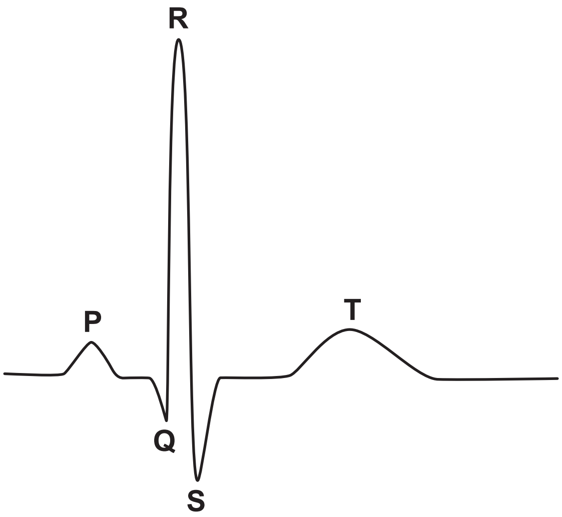
[2]

(iii) Describe **one** symptom of CHD.

.... **[1]**

(d)* An electrocardiogram (ECG) can be used to detect signs of coronary heart disease.

The diagram shows part of an ECG trace for a patient with normal heart activity.



Describe what the ECG trace shows about what is happening in the heart.

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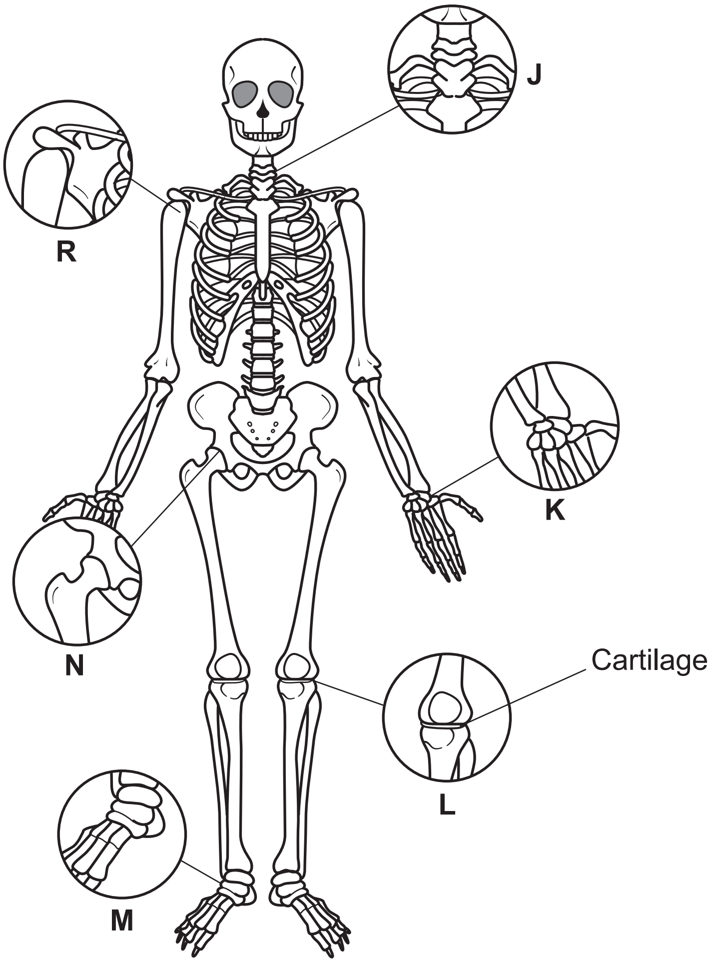
.... **[6]**

5 The diagram shows some of the joints in the musculoskeletal system and where they are found in the body.



(a)

(i) Complete the table below by selecting the correct letter that identifies the joints labelled on the diagram.

Joint	**Letter**
Hinge	....
Pivot	....
Sliding	....

[3]

(ii) Cartilage is labelled on one of the joints in the diagram. Explain the importance of cartilage in a joint.

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.... **[2]**

(b)* Amaya is 75 years old and has been diagnosed with osteoporosis, a malfunction of the musculoskeletal system.

Amaya's doctor has explained that weak bones is a normal part of the ageing process but that other factors have also contributed to the condition.

Discuss the factors that could have contributed to Amaya's condition. Include possible risk factors and biological causes.

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.... **[6]**

(c) Osteoarthritis is also a malfunction of the musculoskeletal system.

(i) Describe **one** impact of osteoarthritis on lifestyle.

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.... **[2]**

(ii) State **one** method that can be used to treat osteoarthritis.

.... **[1]**

END OF QUESTION PAPER

EXTRA ANSWER SPACE

If you need extra space use these lined pages. You must write the question numbers clearly in the margin.