OCR
Oxford Cambridge and RSA

Tuesday 23 May 2023 – 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
C442/2306

C442/2306

No extra materials are needed.

0583/1–04

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 Processes in the digestive system have roles in providing the body cells with essential nutrients.

(a) Match each of the processes of the digestive system with its role by drawing a line between the boxes.

One of the lines has been completed for you.

Processes	Role
absorption	An enzyme in saliva converts starch to maltose.
assimilation	Fats are emulsified into smaller globules.
chemical digestion	Products of digestion get taken up and stored in liver cells.
mechanical digestion	The products of fat digestion diffuse into lacteals.

[3]

(b) Bile is the fluid in the digestive system that is needed to emulsify fats during mechanical digestion.

(i) Name the part of the digestive system where the emulsification of fats takes place.

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

(ii) Name the part of the digestive system that produces bile.

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

(iii) Name the part of the digestive system that stores bile.

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

(c) Gallstones are a malfunction of the digestive system that can cause a blockage in the bile duct.

Name and describe **one** method that is used to treat gallstones.

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

(d)* The stomach is part of the digestive system.

Describe the actions of the stomach in both mechanical **and** chemical digestion.

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

(e) The liver is part of the digestive system that also has breakdown functions. One of these breakdown functions is to remove alcohol and drugs from the blood stream.

(i) Which **one** of the following is the name of the chemical process in which the liver breaks down alcohol?

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

Chemical process	**Tick (✓) one only**
Cell respiration	
Deamination	
Detoxification	

[1]

(ii)* Sarah has symptoms of liver cirrhosis caused by drinking excessive amounts of alcohol over many years.

Discuss how her condition can be monitored and the lifestyle changes she could make to prevent further damage to her liver.

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

(f) The liver also has a role in regulating the levels of glucose in the blood.

Complete the passage about the role of the liver in the regulation of blood glucose by choosing the most appropriate word(s) from the list below.

effector	**fat**	**feedback**	**glycogen**
homeostasis	**osmoregulation**	**pancreas**	**pituitary**

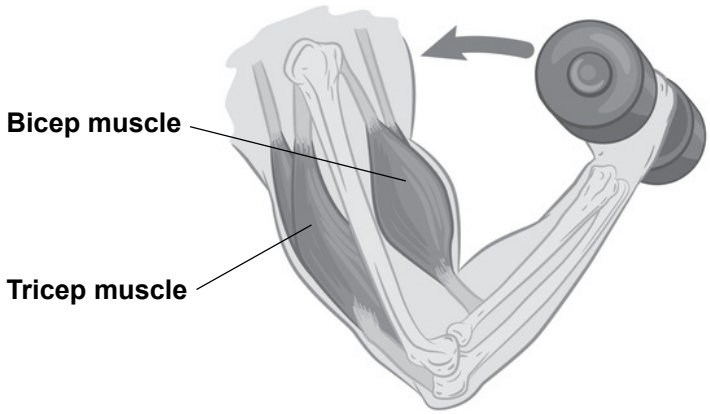
After a meal, glucose levels in the blood increase. This change from normal levels is detected and insulin is secreted by the ..... . Insulin acts on liver cells which remove glucose from the blood and convert it into ..... for storage. This restores normal levels of glucose. The regulation of glucose is done using a ..... mechanism and is an example of ..... that maintains normal or optimal conditions in the body.

[4]

Turn over for the next question

2 The musculoskeletal system contains joints that are moved by the action of muscles.

The diagram below shows muscles in the upper arm moving the elbow joint to lift a weight.



(a) (i) Outline how muscle action at the elbow joint straightens the arm to **lower** the weight.

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..... **[3]**

(ii) Ligaments are components of synovial joints.

Which **one** of the following is the correct description of a ligament?

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

Description of a ligament	**Tick (✓) one only**
Fibrous cord that attaches one bone to another bone to hold them in position.	
Fibrous cord that holds the muscle to the bone.	
Tough fibrous tissue that protects the ends of the bones.	
Tough membrane that acts as a shock absorber.	

[1]

(b) Layla is 55 years old and works as a hairdresser. She has developed severe osteoarthritis in her hands.

(i) State **two** symptoms of osteoarthritis.

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2 ....

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[2]

(ii)* Discuss the impacts of osteoarthritis on Layla's daily life.

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(c) Layla has been told that the endocrine gland in her neck is malfunctioning and is likely to be one of the causes of the osteoarthritis.

(i) Name the endocrine gland found in the neck.

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

(ii) Name the type of chemical produced by endocrine glands.

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

3 The table shows some components of the blood and their functions as part of the cardiovascular system.

(a) **(i)** Complete the table by choosing words or sentences from the list below.

A cell that destroys bacteria to prevent infection.

A cell that transports glucose.

A cell that transports oxygen.

Haemoglobin

Lymphocyte

Monocyte

Platelet

The first row has been completed for you.

Blood component	**Function**
Plasma	Fluid that transports substances dissolved in water.
Erythrocyte	....
.....	A cell that produces antibodies to fight infection.
Neutrophil	....
.....	A cell fragment that has a role in blood clotting.

[4]

(ii) Temperature regulation is an important function of the blood.

Outline why it is important to regulate body temperature.

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

(b) Hypertension is a malfunction of the cardiovascular system that results in blood pressure being higher than normal.

(i)* Explain biological causes and risk factors for hypertension.

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

(ii) State **one** possible treatment for hypertension.

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

4 Inspiration is the process of breathing in to move air into the lungs.

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

alveoli	**contract**	**dome-shaped**	**flat**
pleural membranes	**pressure**	**relax**	**volume**

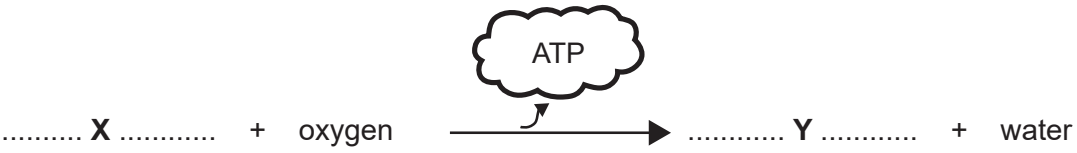
During inspiration, the diaphragm contracts and becomes ..... .

The intercostal muscles ..... to move the ribs upwards and outwards. This causes an increase in the ..... of the thorax and air moves in. Fluid between the ..... prevent friction as the lungs move.

[4]

(b) Inspiration provides oxygen for aerobic respiration to produce ATP.

The equation below shows aerobic respiration.



(i) Name the reactant **X**.

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

(ii) Name the waste product **Y**.

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

(iii) State the role of ATP.

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

(iv) During intense exercise anaerobic respiration occurs.

State **two** differences between aerobic and anaerobic respiration.

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[2]

(c)* Hiro was diagnosed with cystic fibrosis when he was three years old.

Explain the causes and effects of cystic fibrosis.

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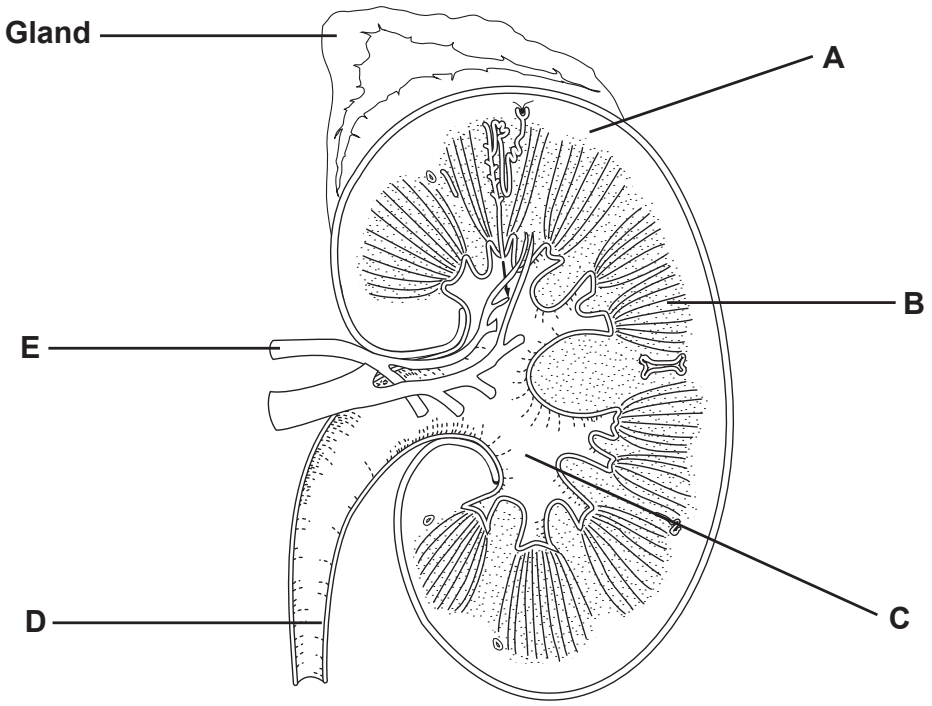
(d) Cystic fibrosis can affect kidney function.

The diagram below shows the structure of the kidney.



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

Structure	Letter
Calyx	.....
Cortex	.....
Medulla	.....
Ureter	.....

[4]

(ii) State the function of the gland labelled on the diagram.

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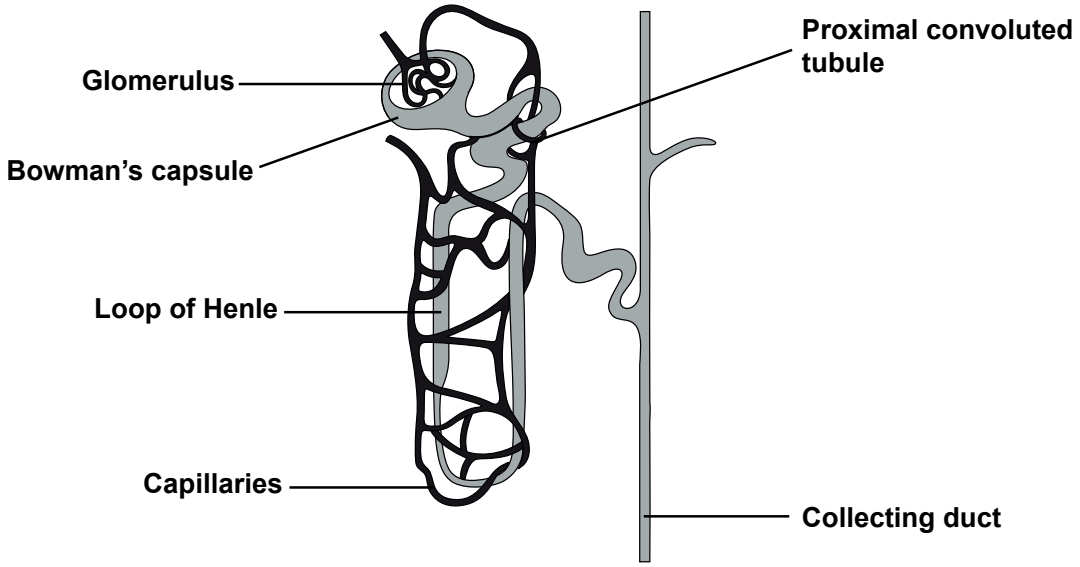
..... **[1]**

The structure of a kidney nephron is shown below.



(e) Describe **two** main functions of the kidney carried out by kidney nephrons.

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[4]

(f)* Eve has nephrotic syndrome, a malfunction of the kidneys.

Evaluate **two** treatments that could be used to reduce the effects of nephrotic syndrome on Eve's body.

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5 The ear is part of the sensory system.

(a) Complete the table below by deciding whether each statement about the structure and functions of components of the ear is True **(T)** or False **(F)**.

Statement	**True (T) or False (F)**
Semi-circular canals have a role in maintaining balance.	.....
The cochlea is one of three bones that transmit vibrations through the middle ear.	.....
The Eustachian tube makes sure that pressure in the middle ear is the same as that in the atmosphere.	.....
The pinna or external ear channels sound waves towards the ear drum.	.....

[4]

(b)* Jack has total hearing loss caused by a brain injury.

Explain the care needs and impact of hearing loss on Jack's lifestyle.

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(c) The brain receives impulses from sensory organs such as the ear.

Choose from the list of terms below to answer the following questions about the brain.

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

cerebellum	**corpus callosum**	**frontal lobes**
hypothalamus	**medulla**	**meninges**

(i) Which is a tough membrane layer around the brain and spinal cord?

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

(ii) Which is a bridge of nervous tissue that connects the cerebral hemispheres?

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

(iii) Which structure is positioned beneath the cerebral hemispheres and is responsible for coordinating muscle activity?

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

(iv) Which acts as a protective barrier against infection?

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

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined pages. The question numbers must be clearly shown – for example, 1(c) or 2(a)(i).