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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Monday 23 May 2022 – 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 plus your additional time allowance

No extra materials are needed.

Please write clearly in black ink.

**Centre
number**

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**Candidate
number**

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First name(s)

Last name

Date of birth

D	D	M	M	Y	Y	Y	Y
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READ INSTRUCTIONS OVERLEAF

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 (*).

ADVICE

Read each question carefully before you start your answer.

Answer ALL the questions.

1 The ear is part of the sensory system.

(a) Choose from the list of structures below to complete the table about the ear.

**Eustachian tube inner ear middle ear
organ of Corti round window stapes**

You may use each structure once, more than once, or not at all. [4]

Description	Structure
A small bone that transmits sound vibrations within the ear.	
Found in the cochlea and contains rows of hair cells.	
Opening covered by a membrane that allows movement of fluid in the cochlea.	
Separated from the external ear by the ear drum.	

(b) Impulses from the sensory organs are carried to the brain by nerves.

(i) Name the nerve that carries impulses from the EAR to the brain.

_____ **[1]**

(ii) Name the nerve that carries impulses from the EYE to the brain.

_____ **[1]**

- (c) The structure of nerve cells (or neurons) is adapted for their function of carrying impulses.

Match each structure with its description by drawing a line between the boxes.

One line has been completed for you. [4]

Structure	Description
axon	A gap between Schwann cells that helps to speed up the nerve impulse.
cell body	Long, thin part of the neuron that conducts the impulse along.
dendron	Part of the neuron that consists of Schwann cells forming an insulating layer.
myelin sheath	Part of the neuron that contains the nucleus.
node of Ranvier	Short, branched part of the neuron that receives impulses from other neurons.

(d) Kai has glaucoma, a malfunction of the eye.

- (i) Which ONE of the following is a possible cause of glaucoma?**

Put a tick (✓) in the box next to the possible cause. [1]

Possible cause of glaucoma	Tick (✓) ONE only
Ageing.	
Air pollution.	
Alcohol misuse.	
Exposure to ultra-violet (UV) light.	

- (ii) Glaucoma is caused by a build-up of pressure inside the eye.**

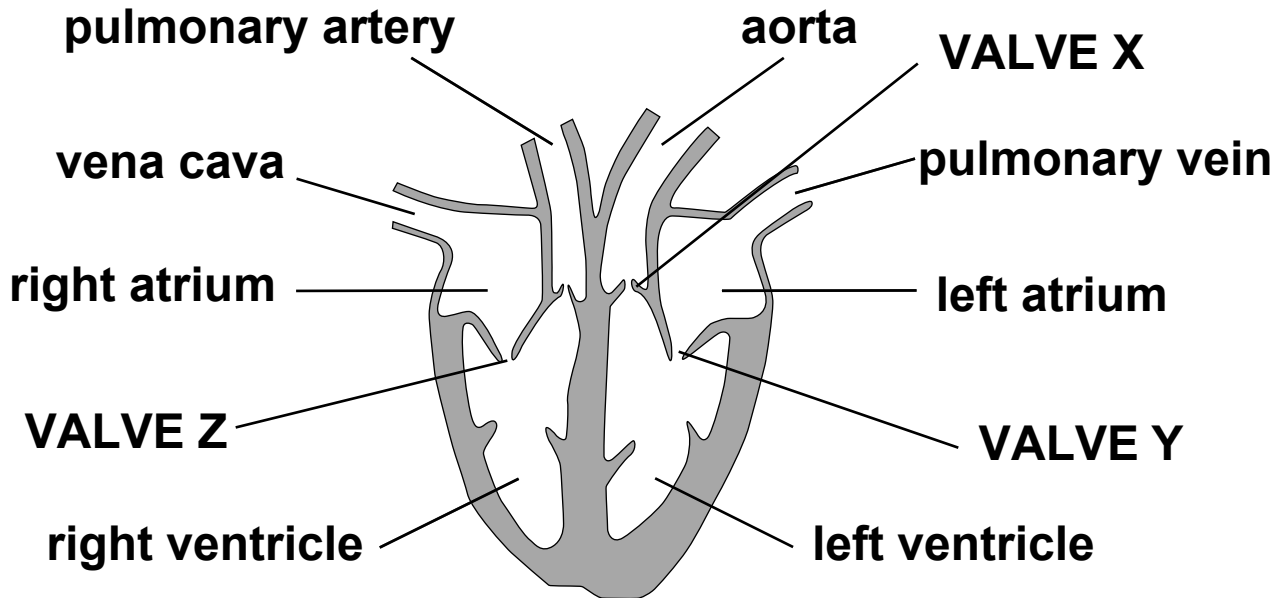
Give ONE reason why pressure could build up inside the eye.

[1]

[illegible]

- 2 FIG. 1 is a diagram of the heart which is part of the cardiovascular system.

FIG. 1



- (a) (i) Which of the valves X, Y or Z on the diagram of the heart is a semi-lunar valve?

[1]

- (ii) Choose from the components of the heart labelled on FIG. 1 to complete the table about their role in heart function.

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

One has been done for you. [4]

Role in heart function	Component
A blood vessel that carries deoxygenated blood from the body back to the heart.	vena cava
A blood vessel that carries oxygenated blood from the lungs back to the heart.	
A blood vessel that carries oxygenated blood out of the heart to the body.	
A chamber that forces blood out of the heart towards the lungs.	
A chamber that receives deoxygenated blood returning from the body.	

- (b) Coronary arteries supply the heart muscle with blood containing absorbed nutrients.

Complete the passage by choosing the most appropriate word(s) from the list below. [4]

ADP	aerobic	anaerobic	
ATP	carbon dioxide	glucose	lactic acid

Absorbed nutrients, such as _____ ,
are needed to supply energy for the contraction of heart
muscle. Energy is supplied in the form of
_____ which is produced during
cellular respiration in the muscle cells. When plenty
of oxygen is available _____
respiration takes place inside mitochondria which
release _____
_____ as a waste product.

- (c) Anika has been admitted to hospital after suffering a suspected heart attack.

- (i) Give TWO symptoms that suggest a person has either suffered a heart attack or has angina. [2]

1 _____

2

(ii)* Anika has been told that she has coronary heart disease (CHD) and that one of her coronary arteries is blocked.

Explain the possible causes and risk factors that could lead to a blocked coronary artery.

(d) Blockages in the arteries leading to the brain can prevent flow of blood containing nutrients and oxygen causing a stroke.

(i) Outline ONE other biological cause of a stroke.

[2]

(ii) Give TWO lifestyle changes that could lower the chances of having a stroke.

1

2

[2]

(e)* Leo has been receiving treatment in hospital after suffering a stroke.

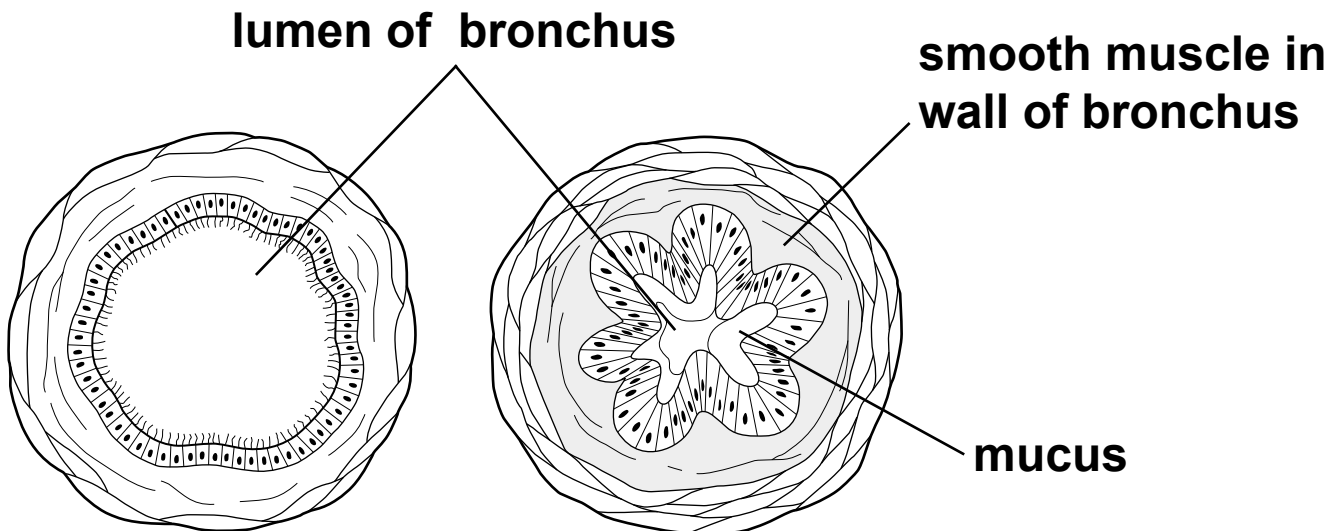
Analyse TWO possible treatments that could help Leo to manage his symptoms and lower the chances of suffering another stroke.

[illegible]

- 3 Bronchi are part of the respiratory system that supplies the oxygen required for cellular respiration.**

FIG. 2 shows a normal bronchus and a bronchus during an asthma attack.

FIG. 2



- (a) Use FIG. 2 to give FOUR reasons why asthma sufferers become breathless, start wheezing and feel tightness in the chest during an asthma attack. [4]**

1

2

3

4

(b)* Charlie is 45 years old and has had asthma since he was a child.

The following treatments have been used to help Charlie manage his symptoms:

inhalers

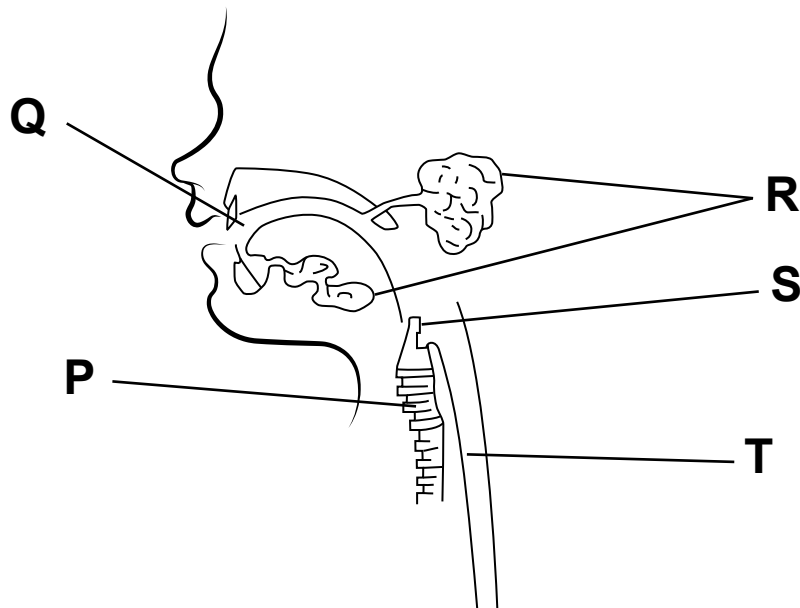
drugs taken as tablets or powders

injections.

Evaluate TWO of these treatments for managing Charlie's asthma. [8]

- 4 (a) FIG. 3 shows part of the digestive system.

FIG. 3



- (i) Complete the table below by choosing the correct letter from FIG. 3 that identifies the structures of this part of the digestive system.

One row has been done for you. [3]

Structure	Letter
buccal cavity	
epiglottis	S
oesophagus	
salivary glands	

- (ii) Describe the structure and function of the epiglottis labelled S on FIG. 3.

[2]

- (b) Outline the role of the part of the digestive system shown in FIG. 3 in the breakdown of food.

[3]

- (c) Irritable bowel syndrome (IBS) is a digestive malfunction that may occur when food moves through the digestive system too quickly.

- (i) State ONE symptom of IBS.

[1]

(ii) State ONE cause of IBS.

[1]

(iii) State ONE treatment or lifestyle change for managing IBS.

[1]

(d) (i) Assimilation is a process carried out by the liver.

Which ONE of the following is the correct meaning of the term assimilation?

Put a tick (✓) in the box next to the correct meaning. [1]

Meaning of assimilation	Tick (✓) ONE only
Emulsifying fat molecules so they have a larger surface area for digestion.	
Movement of digested nutrients into body cells to become part of the cells.	
Movement of digested nutrients into the blood stream.	
Removal of undigested waste from the body.	

(ii)* The liver also has breakdown functions as part of the regulatory system.

Discuss the main functions of the liver in breaking down the excess, toxic or unwanted products of metabolism. [8]

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-
-
-
- (e) The kidney is also a component of the regulatory system.

Complete the table below by deciding whether each statement about the structure and functions of the kidney is True (T) or False (F). [4]

Statement	True (T) or False (F)
Collecting ducts of kidney nephrons have a role in osmoregulation.	
Ultrafiltration takes place in the Bowman's capsule of kidney nephrons.	
Urea is reabsorbed back into the blood as it passes through kidney nephrons.	
Ureters carry urine from the kidneys to the bladder.	

(f)* Ali has nephrotic syndrome. His symptoms include swelling of his legs and blood clots in his urine.

Explain the possible causes for Ali's nephrotic syndrome. Include both biological causes AND risk factors for developing the condition.

[illegible]

5 Joints occur where two bones meet and allow movement between the bones.

(a) Name the type of joint that allows the skull to move on the spinal column.

[1]

(b) Choose from the list below to answer the following questions about the components of a synovial joint.

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

cartilage

ligament

muscle

synovial capsule

synovial fluid

tendon

(i) State the component that contracts and relaxes to move the bones.

[1]

(ii) State the component that lubricates and nourishes the joint.

[1]

(iii) State the component that can act as a shock absorber.

[1]

(iv) State the component that is a type of fibrous tissue that pulls on the bone to move the joint.

[1]

(c)* Beth has arthritis in her knees. She has the following symptoms:

stiff, painful knee joints

inability to kneel down or fully bend her knees

grating noises when she tries to bend her knees.

Explain the likely causes for Beth's symptoms. [6]

[illegible]

(d) Outline ONE type of treatment used to reduce the symptoms of arthritis.

[2]

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(d) or 6(b).

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