

Animal Tissues, Organs and Organ Systems

Question Paper 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Biology
Exam Board	AQA
Topic	4.2 Organisation
Sub-Topic	Animal Tissues, Organs and Organ Systems
Difficulty Level	Gold Level
Booklet	Question Paper 1

Time Allowed: 54 minutes

Score: /51

Percentage: /100

Grade Boundaries:

Q1. Malignant tumours are called cancers.

- (a) Describe how a tumour can spread to different parts of the body.

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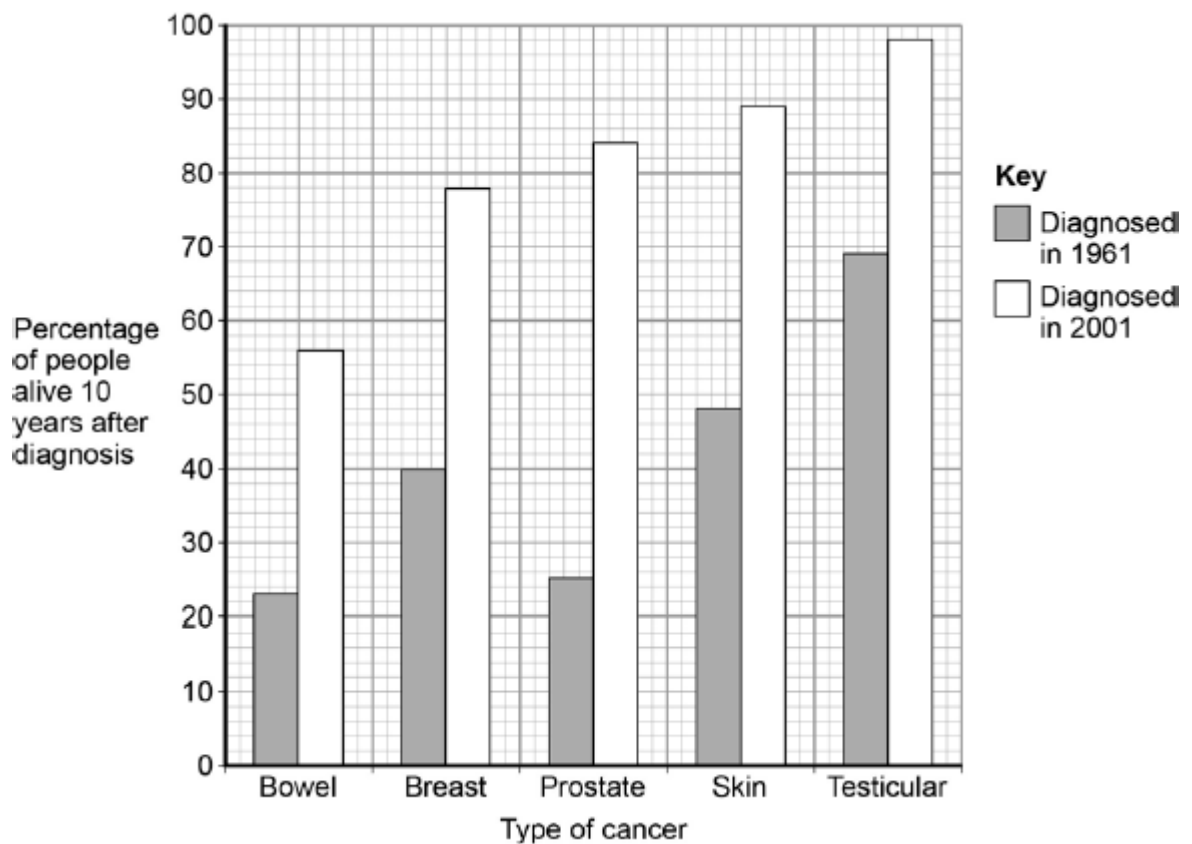
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(2)

- (b) Survival rates for people with cancer have improved a lot.

Some people who are alive 10 years after diagnosis are considered to be cured.

The figure below shows data for people diagnosed with cancer in 1961 and 2001.



Look at the data in the figure above for skin cancer.

Calculate the percentage increase in the survival rate of people diagnosed with skin cancer in 1961 compared to 2001.

Give your answer to **three** significant figures.

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Survival rate increase = %

(2)

- (c) Look at the data in the figure above for bowel and prostate cancer.

Compare the survival rates for bowel and prostate cancer.

Suggest reasons for the comparisons you have made.

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(4)

(Total 8 marks)

- Q2.(a)** Blood is made up of four main components.

Red blood cells and white blood cells are two of these components.

Describe the functions of the **two** other components of blood.

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(2)

- (b) The heart is often described as a **double pump**.

Describe why.

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(1)

- (c) In coronary heart disease (CHD) layers of fatty material build up inside the coronary arteries. This can cause a heart attack.

Statins and stents can be used to reduce the risk of a heart attack in people with CHD.

Evaluate the use of statins and stents in people with CHD.

Remember to include a justified conclusion.

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(6)

(Total 9 marks)

Q3. Coronary heart disease (CHD) can be caused by many factors.

The table below shows data related to CHD for five countries.

Country	Number of deaths from CHD per 100 000 population per year	Percentage of the population who smoke tobacco	Percentage of the population who drink alcohol heavily	Amount of fruit and vegetables eaten in kg per person per year
A	285	36	19	180
B	251	63	34	404
C	186	47	36	251
D	149	23	34	218
E	128	27	12	222

- (a) Name **one** risk factor for CHD that is **not** shown in the table above.

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(1)

- (b) A student concludes that the main cause of CHD is not eating enough fruit and vegetables.

Give **three** reasons why the student's conclusion is **not** correct.

Use information from the table above.

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(3)

- (c) Explain how the build-up of fatty material can damage the heart.

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(4)

- (d) Describe how statins can help to reduce deaths from CHD.

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(2)

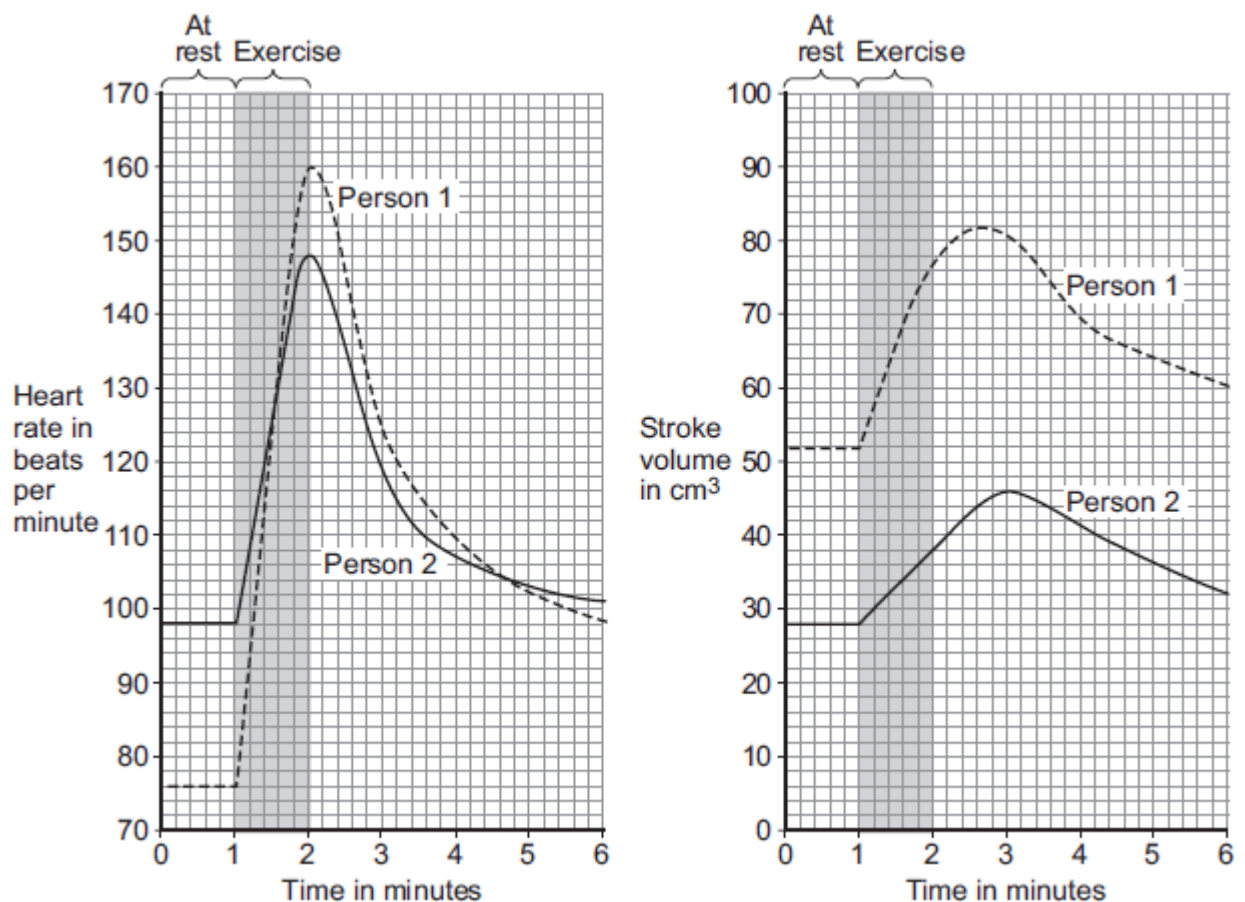
(Total 10 marks)

Q4. During exercise, the heart beats faster and with greater force.

The 'heart rate' is the number of times the heart beats each minute. The volume of blood that travels out of the heart each time the heart beats is called the 'stroke volume'.

In an investigation, **Person 1** and **Person 2** ran as fast as they could for 1 minute. Scientists measured the heart rates and stroke volumes of **Person 1** and **Person 2** at rest, during the exercise and after the exercise.

The graph below shows the scientists' results.



- (a) The 'cardiac output' is the volume of blood sent from the heart to the muscles each minute.

$$\text{Cardiac output} = \text{Heart rate} \times \text{Stroke volume}$$

At the end of the exercise, **Person 1's** cardiac output = $160 \times 77 = 12\,320 \text{ cm}^3$ per minute.

Use information from **Figure above** to complete the following calculation of **Person 2's** cardiac output at the end of the exercise.

At the end of the exercise:

Person 2's heart rate = beats per minute

Person 2's stroke volume = cm^3

Person 2's cardiac output = cm^3 per minute

(3)

- (b) **Person 2** had a much lower cardiac output than **Person 1**.

- (i) Use information from **Figure above** to suggest the **main** reason for the lower cardiac output of **Person 2**.

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(1)

- (ii) **Person 1** was able to run much faster than **Person 2**.

Use information from **Figure above** and your own knowledge to explain why.

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(5)

(Total 9 marks)

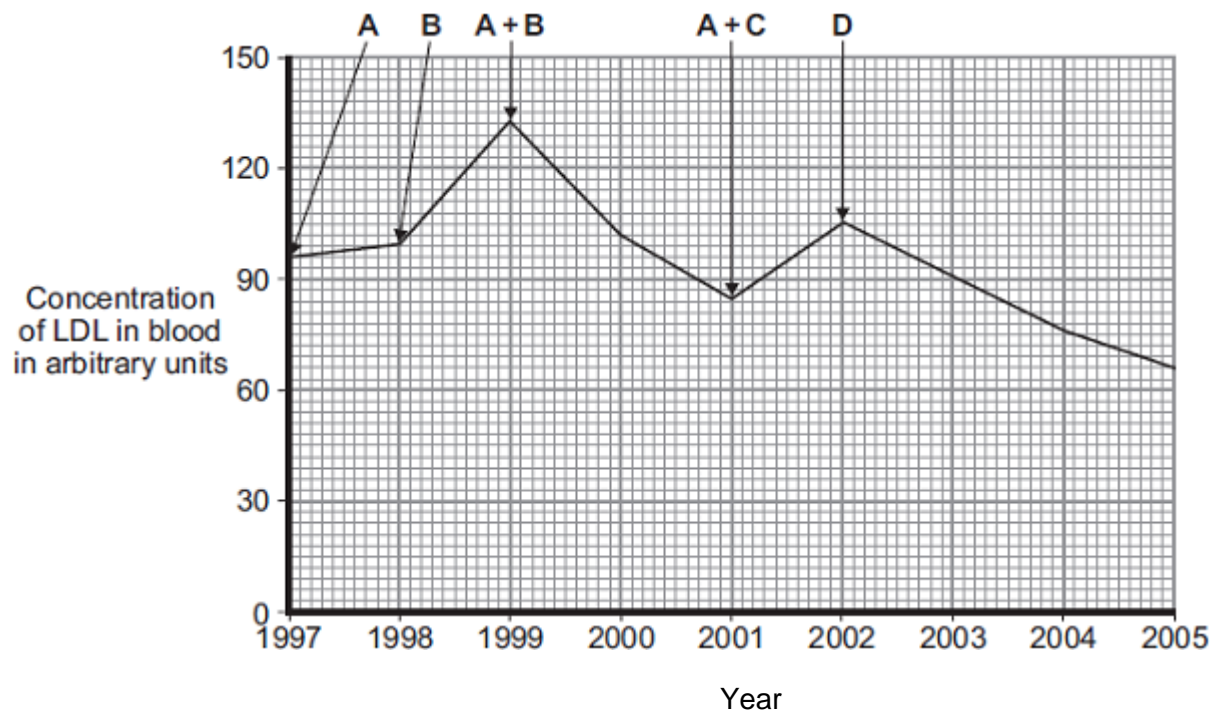
Q5.LDL is one form of cholesterol found in the blood.

People with a high concentration of LDL in their blood may be treated with drugs called statins.

A high concentration of LDL cholesterol in the blood may result in an increased risk of heart and circulatory diseases.

The graph shows the effects of the treatment of one person with four different statins, **A**, **B**, **C** and **D**, over a period of 8 years. The arrows show when each new treatment was started.

Each treatment was continued until the next treatment was started.



Compare the effectiveness of the five treatments in reducing the risk of heart and circulatory diseases for this person.

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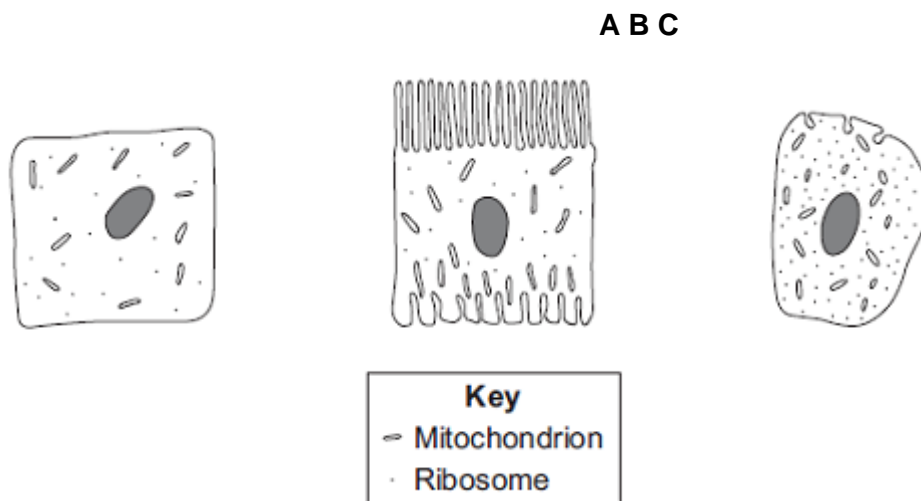
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(Total 4 marks)

Q6. Diagrams **A**, **B** and **C** show cells from different parts of the human body, all drawn to the same scale.



- (a) Which cell, **A**, **B** or **C**, appears to be best adapted to increase diffusion into or out of the cell?

Give **one** reason for your choice.

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(1)

- (b) (i) Cell **C** is found in the salivary glands.

Name the enzyme produced by the salivary glands.

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(1)

- (ii) Use information from the diagram to explain how cell **C** is adapted for producing this enzyme.

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(2)

(Total 4 marks)

Q7. Fresh milk is a mixture of compounds including lipid, protein and about 5% lactose sugar.

Lactose must be digested by the enzyme lactase, before the products can be absorbed.

Lactase can be added to fresh milk to pre-digest the lactose. This makes 'lactose-free' milk, which is suitable for people who do not produce enough lactase of their own.

A student investigated the effect of changing pH and temperature on the digestion of lactose in milk.

The results are shown in **Tables 1** and **2**.

Table 1
Effect of pH

pH	Time taken to digest lactose in minutes
4.0	20
5.0	18
6.0	13
7.0	7
8.0	5
9.0	6

Table 2
Effect of temperature

Temperature in °C	Time taken to digest lactose in minutes
25	20
30	14
35	11
40	6
45	29
50	No digestion

(a) The label on a carton of lactose-free milk states:

'Lactase is normally produced in the stomach of mammals.'

The results in **Table 1** suggest that this statement is **not** true.

Explain how.

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(2)

- (b) Explain, as fully as you can, the results shown in **Table 2** .

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- (c) Bile is produced in the liver and is released into the small intestine.

Bile helps the digestion of lipid in the milk.

Describe how.

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(2)

(Total 7 marks)