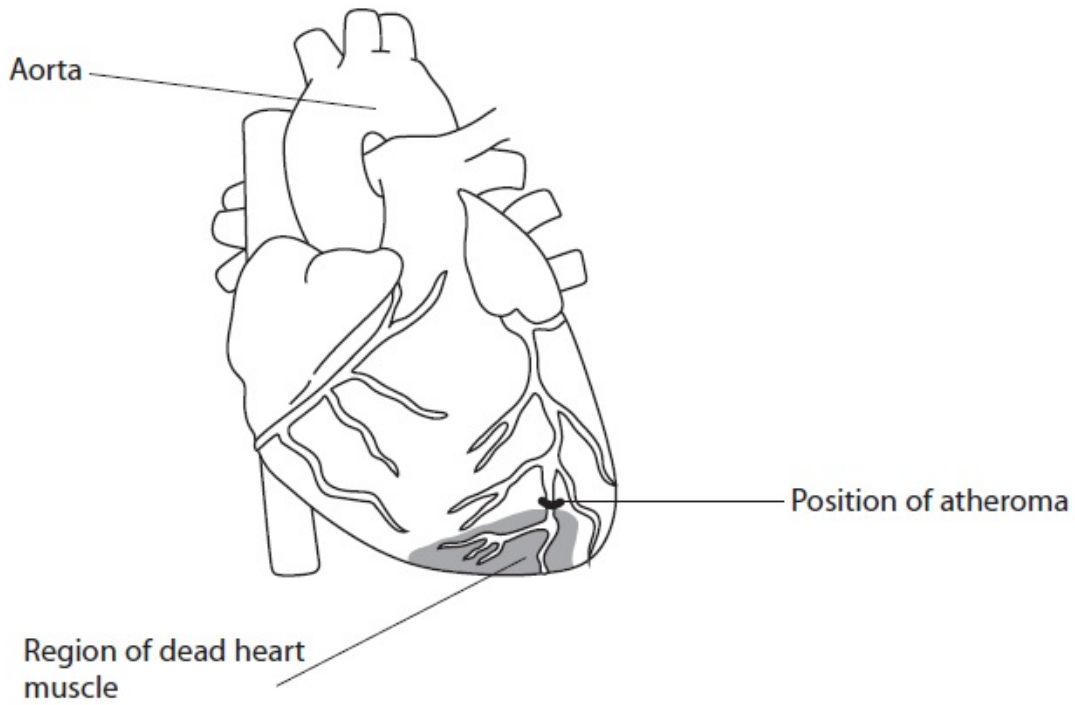Q1.

Atherosclerosis is responsible for many deaths that result from cardiovascular disease (CVD).

The diagram below shows an external view of a human heart. The position of an atheroma (plaque) is shown and a region of dead heart muscle is shaded.

(a) (i) Explain how the structure of the aorta relates to its function.

(3)

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(ii) Describe **two** differences between the structure of a capillary and the structure of a vein.

(2)

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(b) (i) Suggest how the location of the atheroma results in the position and size of this region of dead heart muscle.

(3)

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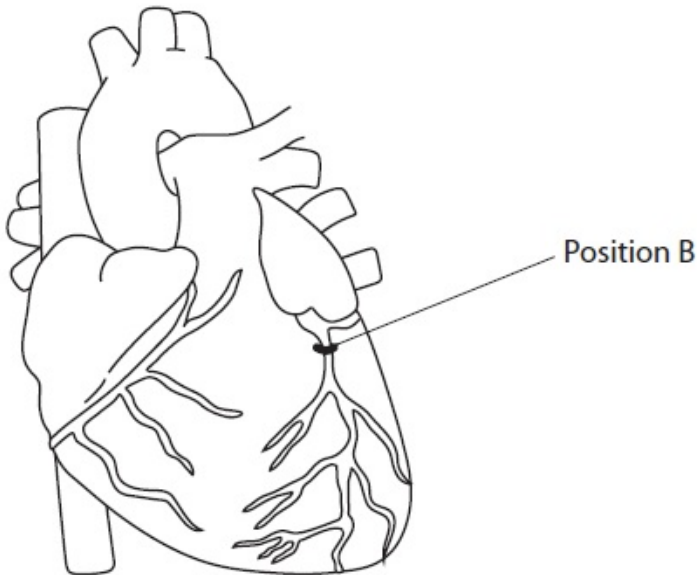
(ii) On the diagram below, shade an area to show the position and size of dead heart muscle, if the atheroma occurred at position B.

(2)

Position B

(Total for question = 10 marks)

Q2.   Blood clots can form if the lining of an artery becomes damaged.

(a) For each of the statements below, put a cross ⊠ in the box that corresponds to the correct statement about the blood clotting process.

(i) A platelet

(1)

⊠ **A**   is a protein that forms an insoluble mesh to trap red blood cells

⊠ **B**   is an enzyme that converts prothrombin into thrombin

⊠ **C**   is a cell fragment that releases thromboplastin

⊠ **D**   is a cell fragment that releases fibrinogen

(ii) Thrombin is

(1)

⊠ **A**   an enzyme that changes fibrinogen into fibrin

⊠ **B**   an enzyme that changes fibrin into fibrinogen

⊠ **C**   an insoluble protein that forms a mesh to trap red blood cells

⊠ **D**   a protein that sticks to collagen in damaged walls of arteries

(iii) Fibrinogen is

(1)

⊠ **A**   an insoluble protein that forms a mesh to trap red blood cells

⊠ **B**   a soluble plasma protein

⊠ **C**   an enzyme that converts prothrombin into thrombin

⊠ **D**   a clotting factor released by platelets

(b) A stroke can be caused by cardiovascular disease (CVD) affecting arteries leading to the brain. Callum's family has a history of strokes.

(i) Explain why a blood clot in an artery leading to the brain could cause a stroke.

(3)

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(ii) Suggest **two** lifestyle changes Callum could make to reduce his risk of suffering a stroke in later life.

(2)

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(Total for Question = 8 marks)

Q3.

(a) Some foods and drinks contain plant statins.

Explain the benefits of plant statins to human health.

(2)

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(b) In a three-year study, the percentage of patients with CVD (cardiovascular disease) who were using different types of drugs was recorded.

The graph below shows the results of this study.
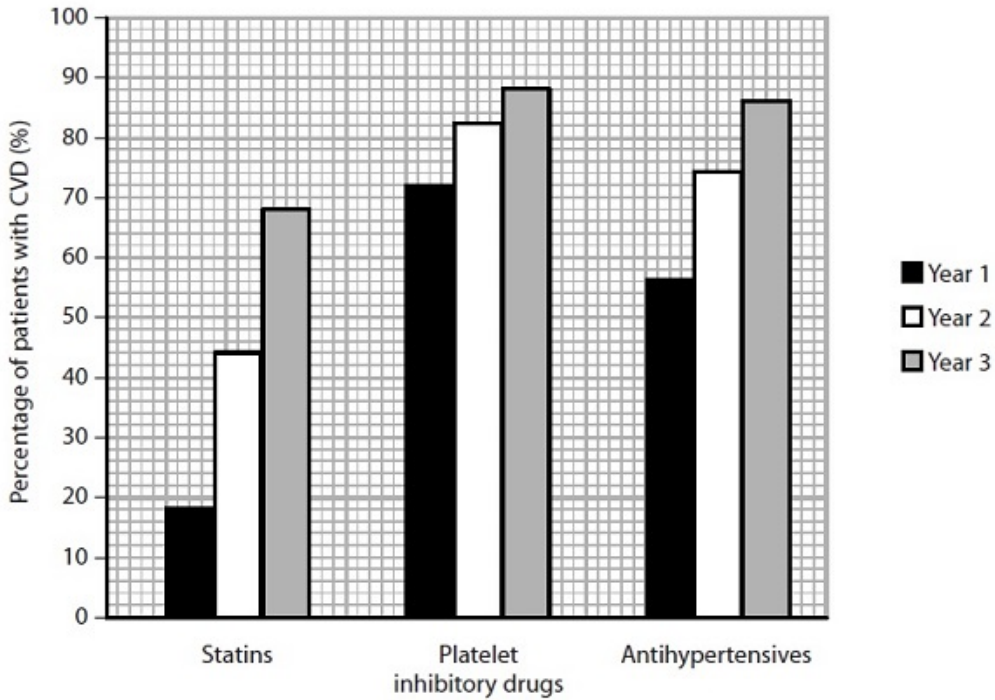
(i) Suggest why there was an increase in the percentage of patients taking statins over the three years of the study.

(2)

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(ii) Using the information in the graph, compare the change in the use of platelet inhibitory drugs with the change in the use of antihypertensives, over the three years of this study.

(3)

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(c) Explain why patients with CVD would take each of the following drugs.

(i) Platelet inhibitory drugs such as aspirin

(2)

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(ii) Antihypertensives such as beta-blockers

(2)

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(Total for question = 11 marks)

Q4.

Cardiovascular disease (CVD) is a major cause of death in developed countries.

A high body mass index (BMI) and diabetes are two risk factors for CVD.

Which of the following is another risk factor for CVD?

(1)

☒ **A** high blood pressure

☒ **B** low blood cholesterol

☒ **C** low salt intake

☒ **D** using statins

(Total for question = 1 mark)

Q5.

It is possible to reduce the risk of CVD by taking medication or changing diet.

Explain the role of antihypertensive drugs in reducing the risk of atherosclerosis.

(4)

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(Total for question = 4 marks)

Q6.

(a) Read through the following passage about the structure of the heart. Write on the dotted lines the most appropriate word or words to complete the passage.

(5)

The heart muscle in the walls of the heart is called .... muscle.

The .... valves control the flow of blood between the chambers of the heart.

The chamber of the heart that receives oxygenated blood from the lungs is named the ....

Deoxygenated blood is transported back to the lungs in the ....

Backflow of blood into the heart is prevented by .... valves.

(b) Arteries and capillaries are blood vessel adapted for specific roles in the circulatory system.

Give **two** differences between the structure of an artery and a capillary.

(2)

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(c) Anticoagulants, such as warfarin, are used to treat cardiovascular disease (CVD).

(i) Explain how anticoagulants can help reduce the effects of CVD.

(2)

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(ii) State **one** risk associated with the use of anticoagulants.

(1)

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(Total for question = 10 marks)