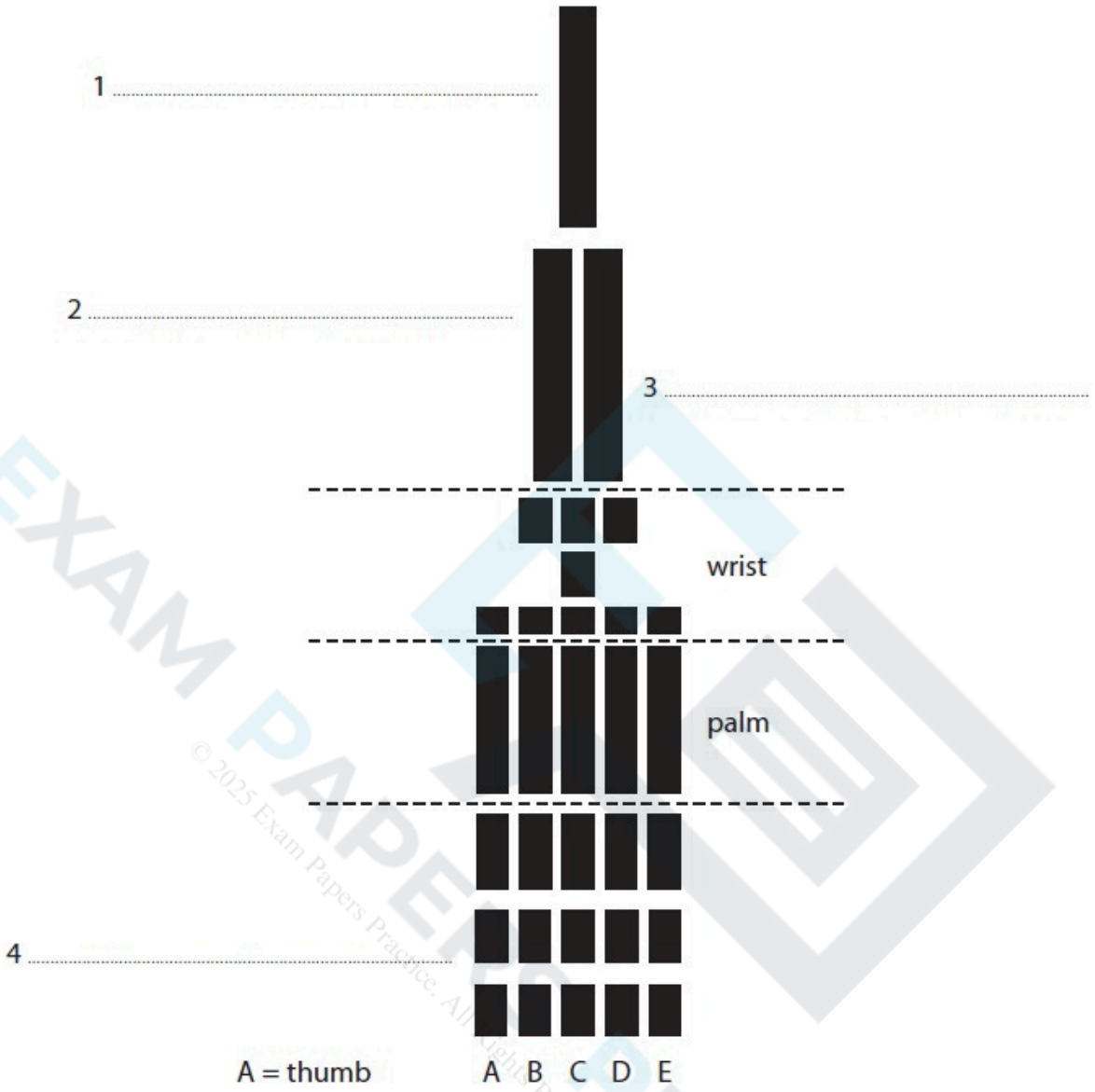
Q1.

The diagram shows a model representing the arrangement of bones in the arm.



(a) (i) Name the bones labelled 1, 2, 3 and 4 on the diagram.

(ii) A hinge joint is a synovial joint.

Draw a circle on the diagram to show where a hinge joint is found.

(iii) Name two other types of synovial joint found in the skeleton.

1 .....

2 .....

(b) Vitamin D is important for the growth and development of healthy bones.

Explain how vitamin D helps the growth and development of bones.

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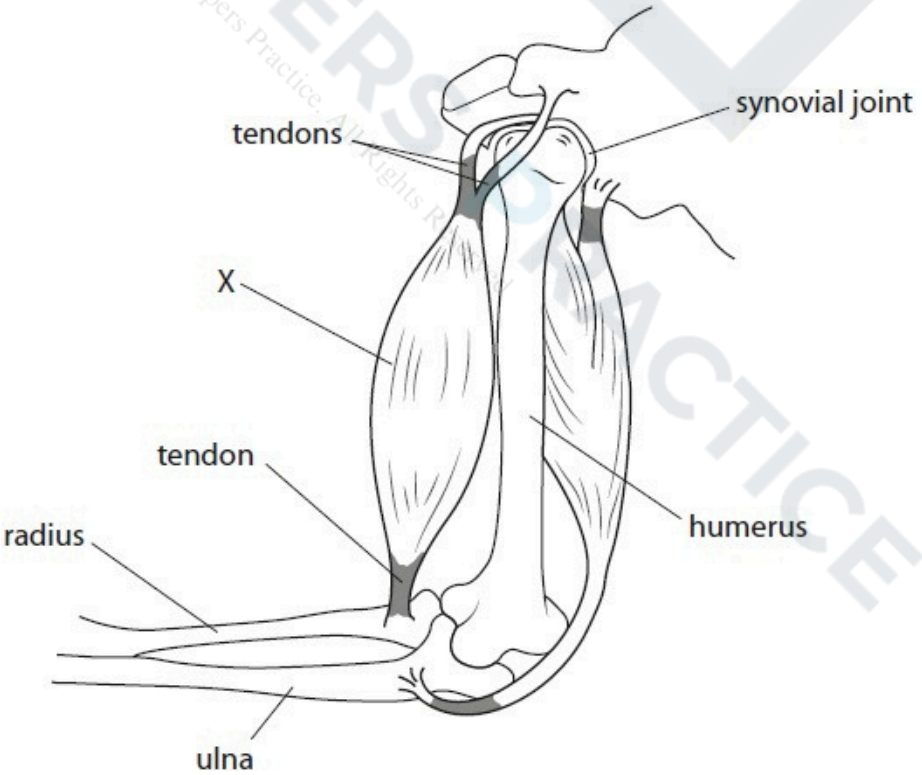
(Total for question = 10 marks)

Q2.

The diagram shows the bones of a human arm and the muscles that move the lower arm.



(a) (i) Muscle X needs energy to contract.

Name the process that supplies this energy.

(ii) Muscle X contracts when the lower arm is raised further. Describe the changes in shape of muscle X when the lower arm is raised further.

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(iii) Explain how the contraction of muscle X causes the lower arm to be raised.

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(b) Draw a labelled diagram to show the internal structure of the synovial joint.

(Total for question = 12 marks)

Q3.
Osteoporosis is a disease that affects bones. Bones become weak and can easily be damaged. Once bones are damaged from osteoporosis they are difficult to repair.
One in every three women and one in nine men over the age of 60 in the UK have osteoporosis.
In 1990, data showed that 1.7 million people worldwide fractured their hip bone. 30% of these were men.
Osteoporosis is known as the 'silent disease'.

Taking measures in early life to prevent this condition is more appropriate than treating the condition once it has become established.

(a) (i) Calculate the total number of men worldwide who fractured their hip bone in 1990. Show your working.

total number = ...

(ii) In 1990, only 25% of people in the UK that fractured their hip bone were men.
Suggest **two** possible reasons for the difference in the percentage of men worldwide and the percentage of men in the UK who fractured their hip bone.

1 .....

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2 .....

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(b) Explain **two** measures that can be taken in early life to prevent osteoporosis.

1 .....
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2 .....
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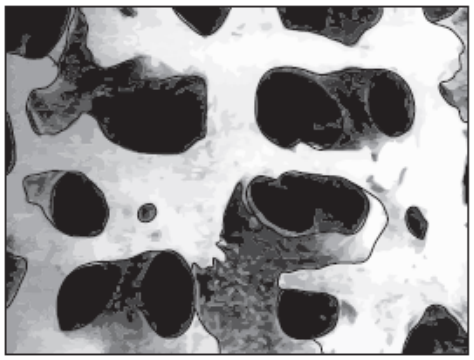
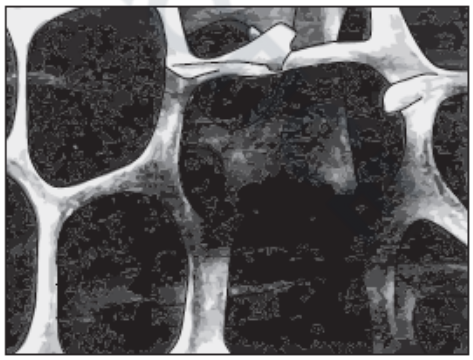
(c) The photographs show the structure of healthy bone and bone that is damaged by osteoporosis.



healthy bone



bone damaged by osteoporosis

(i) Describe how bone damaged by osteoporosis differs from healthy bone.

Use the photographs to help you with your answer.

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(ii) Suggest why osteoporosis is known as the 'silent disease'.

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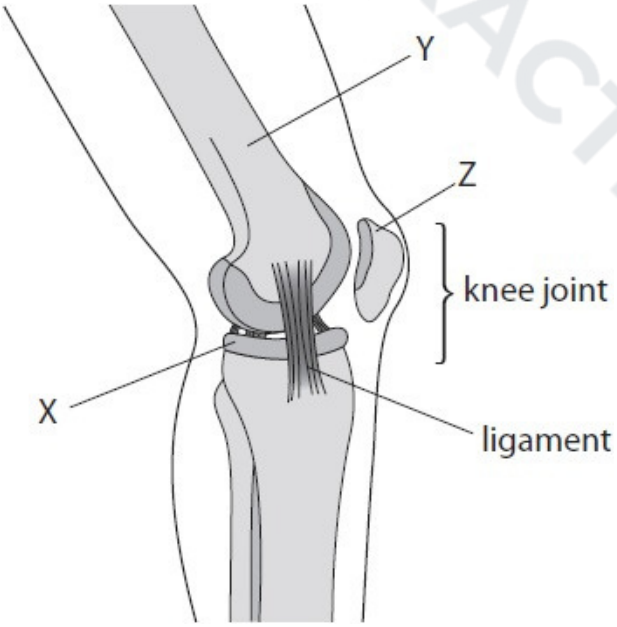
(Total for question = 12 marks)

Q4.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

(a) The diagram shows structures in part of a human leg.



(i) The box lists structures in the human leg.

cartilage	femur	kneecap	muscle
fibula	tendon	tibia	

Use words from the box to name structures X, Y, and Z.

X .....

Y .....

Z .....

(ii) What is the function of ligaments in the knee joint?

☒ **A** ligaments attach muscles to the leg bones

☒ **B** ligaments hold the leg bones together

☒ **C** ligaments move the leg bones

☒ **D** ligaments stop the leg bones rubbing together

(iii) The type of joint found in the knee and the elbow is the same.

Give the name of this type of joint.

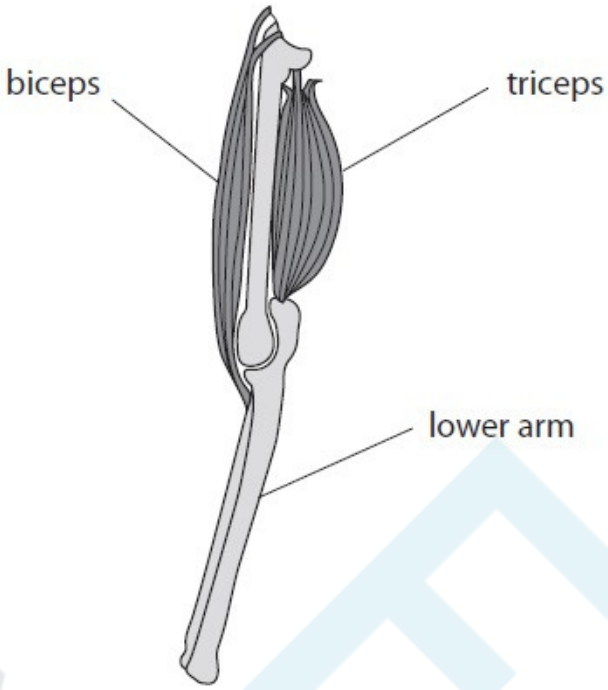
(b) Aerobic respiration releases energy for muscles to contract.

Complete the word equation for aerobic respiration.

glucose + ... → ..... + water

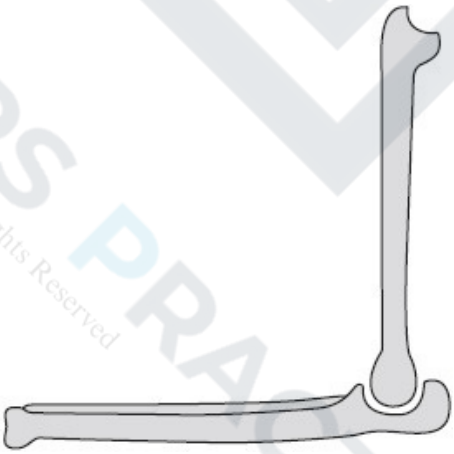
(c) Diagram 1 shows a model of the human arm, with the lower arm extended.

Diagram 1



Complete diagram 2 to show how the muscles change when the lower arm is raised.

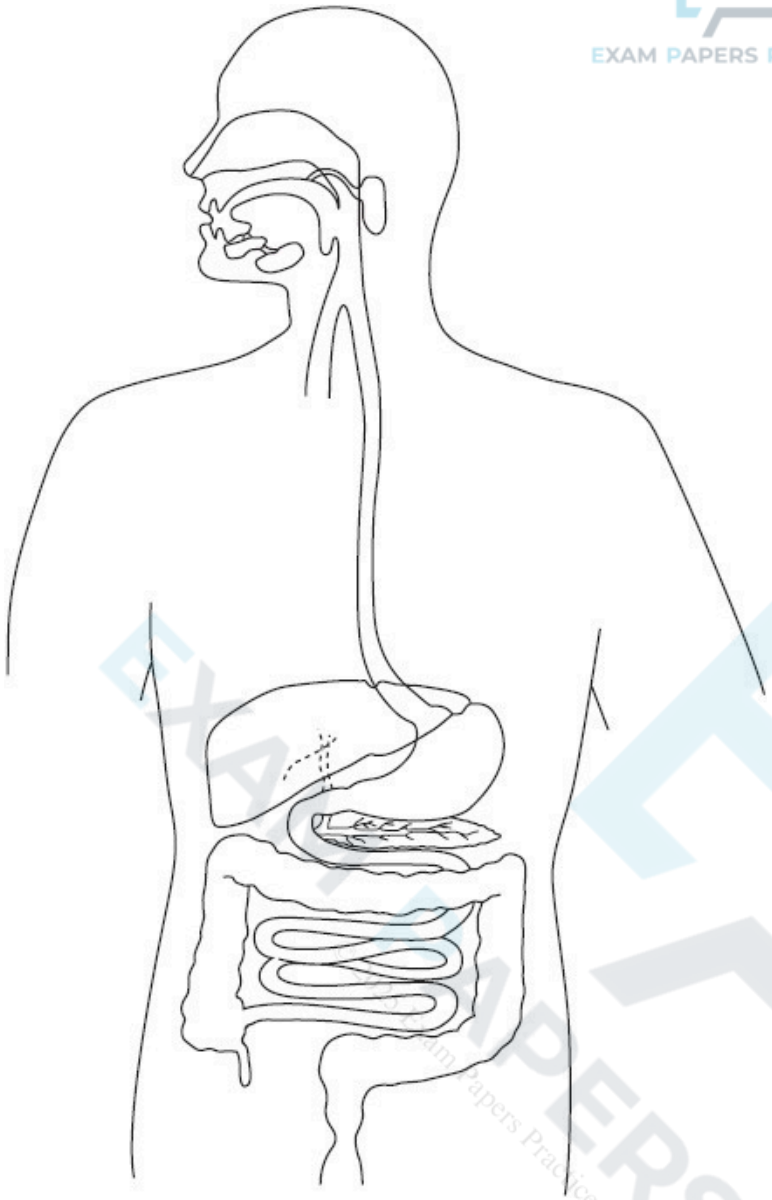
Diagram 2



(Total for question = 9 marks)

Q5.

The diagram shows the alimentary canal.



(a) Identify these areas of the alimentary canal using label lines and the correct letters.

(i) Label with an X the area where starch digestion begins.

(ii) Label with a Y the area that has a pH of 2

(iii) Label with a Z the area where both lipid and protein digesting enzymes are produced.

(b) Some people have the condition known as coeliac disease. This results in the villi being flattened.
Explain why some people with untreated coeliac disease will eventually develop osteoporosis.

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(c) Another condition of the alimentary canal is colon cancer. This is often treated by removal of the large intestine. Explain why people who have this treatment often suffer from dehydration.

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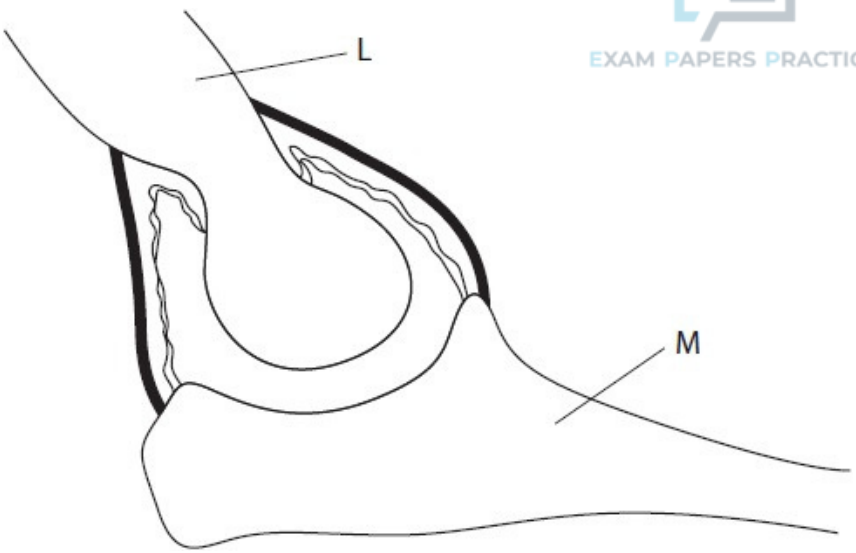
(Total for question = 9 marks)

Q6.

The diagram shows some of the structures of the elbow joint.



(a) State what is meant by the term **joint**.

(2)

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(b) (i) Give the name of bone L and the name of bone M.

(2)

L .....

M .....

(ii) Cartilage has not been shown on the diagram.

Draw the missing cartilage on the diagram.

(2)

(c) Explain the effects on a person if the cartilage in this joint is missing or damaged.

(2)

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(d) Tendons are important in the functioning of a joint. Explain the importance of tendons in the movement of bone M.

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(Total for question = 12 marks)