

**AQA, OCR, Edexcel**

**A Level**

# **A Level Biology**

## **Muscles Questions**

Name:

**M M E**

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**Total Marks: /32**

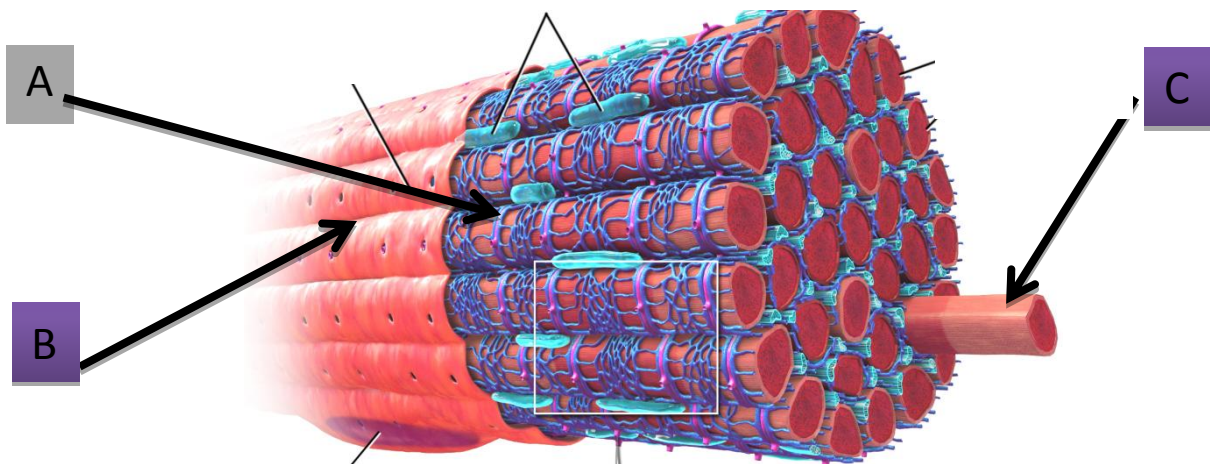
## Muscle Contraction

There are approximately 640 skeletal muscles in the human body. Muscles produce movement through contraction; skeletal muscles are involved in movement. They act as effectors because they react to stimuli.

1. A skeletal muscle is an organ of the muscular system and is made up of many different components.

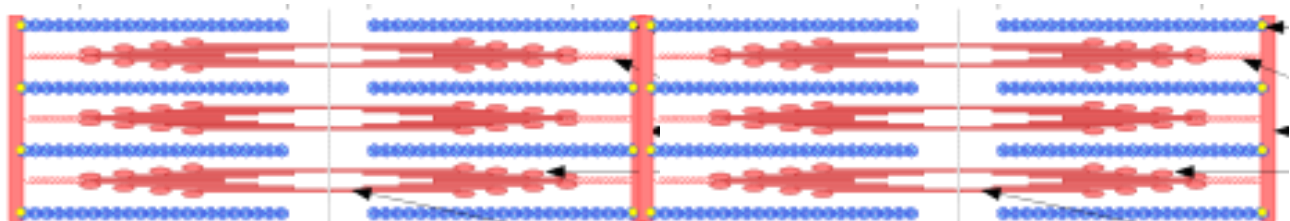
a) The diagram below shows a muscle.

i) Identify the parts labelled A - D. (3 marks)



ii) Why do muscle cells contain a large quantity of mitochondria? (2 mark)

iii) Label the different filaments on the diagram below. (2 marks)



- iv) Use the terms in the box below to label the diagram of the sarcomere.  
(4 marks)

I - Band	A - Band
H - Zone	Z - Line

- v) Explain how a muscle contraction affects each part of the sarcomere listed in the box above. (4 marks)

2. The sliding filament theory describes the processes occurring during muscle contraction. It is thought that contraction occurs through the repetition of the actin and myosin cross bridge cycle.

- a) i) How is the structure of actin and myosin adapted for their functions? (2 marks)

- ii) What is the role of tropomyosin in muscle contraction? (3 marks)

- iii) Calcium ions trigger muscle contraction. Explain the role of calcium ions in this process. (6 marks)

3. Adenosine Triphosphate is an important molecule with many biological functions, It is said to be the 'energy currency' used by all living organisms.

- a) Describe the role of ATP in muscle contraction? (4 marks)

- b) Using your knowledge of ATP, explain why rigor mortis causes the muscles to stiffen? (2 marks)