



Rewarding Learning

**ADVANCED**  
General Certificate of Education  
2024

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--	--

# Sport Science and the Active Leisure Industry

Assessment Unit A2 2

*assessing*



The Application of Science  
to Sports Performance

**[AAL21]**

\*AAL21\*

**TUESDAY 11 JUNE, MORNING**

## TIME

2 hours.

## INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided.**

**Do not write outside the boxed area on each page, or on blank pages.**

Complete in black ink only. **Do not write with a gel pen.**

Answer **all five** questions.

## INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in questions **3(c)**, **4(b)(ii)**, **5(b)** and **5(c)**.



Answer **all** questions

During exercise, muscles contract to produce efficient movement.

1 (a) Identify and describe **two** types of muscular contraction.

(i) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [2]

(ii) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ [2]



(b) Describe a **structural** characteristic of the following skeletal muscle fibre types and state a sporting activity suited to each:

(i) Slow twitch / Type I fibres:

---

---

---

---

---

---

---

---

---

---

[2]

(ii) Fast twitch glycolytic / Type IIb fibres:

---

---

---

---

---

---

---

---

---

---

[2]

[Turn over







Successful coaches use a range of transfer methods to enhance learning and performance.

**(b)** Explain each transfer of learning method using a relevant sporting example.

**(i)** Positive Transfer:

---

---

---

---

---

---

---

---

[2]

**(ii)** Bilateral Transfer:

---

---

---

---

---

---

---

---

[2]



**(iii) Retroactive Transfer:**

---

---

---

---

---

---

---

[2]



Skills are acquired for sport through learning and practice.

**3 (a)** Identify **three** types of skill.

---

---

---

[3]











---

---

---

---

[8]

14177

[Turn over



\*28AAL2111\*

Synovial joints allow a range of movement patterns to complete sporting actions.

**4 (a)** Define each of the movement patterns using relevant sporting examples. Identify the synovial joint and the agonist/prime mover.

**(i) Plantar Flexion:**

---

---

---

---

Sporting example:

---

---

---

---

Synovial joint:

---

---

Agonist/prime mover:

---

---

[4]



**(ii) Flexion of the elbow:**

---

---

---

---

**Sporting example:**

---

---

---

---

**Synovial joint:**

---

---

**Agonist/prime mover:**

---

---

[4]



**(iii) Abduction of the shoulder:**

---

---

---

---

**Sporting example:**

---

---

---

---

**Synovial joint:**

---

---

**Agonist/prime mover:**

---

---

[4]



An efficient cardiovascular system is essential for an endurance athlete.

(b) (i) Define the term bradycardia and identify a **structural** adaptation that enables it to occur.

---

---

---

---

---

---

---

---

---

---

[2]

[Turn over

14177



\*28AAL2115\*








---



---



---



---



---



---



---



---



---



---

[10]

[Turn over

14177



\*28AAL2117\*





(ii) Disadvantages:

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

[4]







---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

[12]

14177

[Turn over



\*28AAL2121\*





A large rectangular area with a thick black border, containing 20 horizontal lines for writing.

14177

[Turn over



\*28AAL2123\*

---

---

---

---

---

---

---

---

---

---

[16]

---

**THIS IS THE END OF THE QUESTION PAPER**

---







**BLANK PAGE**

**DO NOT WRITE ON THIS PAGE**

14177



\*28AAL2125\*

**BLANK PAGE**  
**DO NOT WRITE ON THIS PAGE**

14177



\*28AAL2126\*





**BLANK PAGE**  
**DO NOT WRITE ON THIS PAGE**

14177



\*28AAL2127\*

**DO NOT WRITE ON THIS PAGE**

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
<b>Total Marks</b>	

Examiner Number

Permission to reproduce all copyright material has been applied for.  
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

AAL21/4  
289648



\*28AAL2128\*