



## ATAR course examination, 2023

### Question/Answer booklet

# PHYSICAL EDUCATION STUDIES

Place one of your candidate identification labels in this box.  
Ensure the label is straight and within the lines of this box.

WA student number: In figures

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In words

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### Time allowed for this paper

Reading time before commencing work: ten minutes  
Working time: two and a half hours

Number of additional  
answer booklets used  
(if applicable):

### Materials required/recommended for this paper

#### *To be provided by the supervisor*

This Question/Answer booklet  
Multiple-choice answer sheet

#### *To be provided by the candidate*

Standard items: pens (blue/black preferred), pencils (including coloured), sharpener, correction fluid/tape, eraser, ruler, highlighters

Special Items: up to three calculators, which do not have the capacity to create or store programmes or text, are permitted in this ATAR course examination

### Important note to candidates

No other items may be taken into the examination room. It is **your** responsibility to ensure that you do not have any unauthorised material. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.



## Structure of the examination

The Physical Education Studies ATAR course examination consists of a written component and a practical (performance) component.

## Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of written examination
Section One Multiple-choice	20	20	30	20	20
Section Two Short answer	7	7	70	63	50
Section Three Extended answer	4	2	50	30	30
<b>Total</b>					100

## Instructions to candidates

- The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2023: Part II Examinations*. Sitting this examination implies that you agree to abide by these rules.
- Answer the questions according to the following instructions.

**Section One:** Answer all questions on the separate Multiple-choice answer sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. Do not use erasable or gel pens. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

**Section Two:** Write your answers in this Question/Answer booklet preferably using a blue/black pen. Do not use erasable or gel pens. Wherever possible, confine your answers to the line spaces provided.

**Section Three:** Consists of four questions. You must answer two questions. Write your answers in this Question/Answer booklet preferably using a blue/black pen. Do not use erasable or gel pens.

- You must be careful to confine your answers to the specific questions asked and to follow any instructions that are specific to a particular question.
- Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

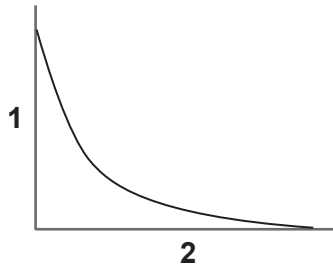
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**Section One: Multiple-choice****20% (20 Marks)**

This section has **20** questions. Answer **all** questions on the separate Multiple-choice answer sheet provided. For each question, shade the box to indicate your answer. Use only a blue or black pen to shade the boxes. Do not use erasable or gel pens. If you make a mistake, place a cross through that square, then shade your new answer. Do not erase or use correction fluid/tape. Marks will not be deducted for incorrect answers. No marks will be given if more than one answer is completed for any question.

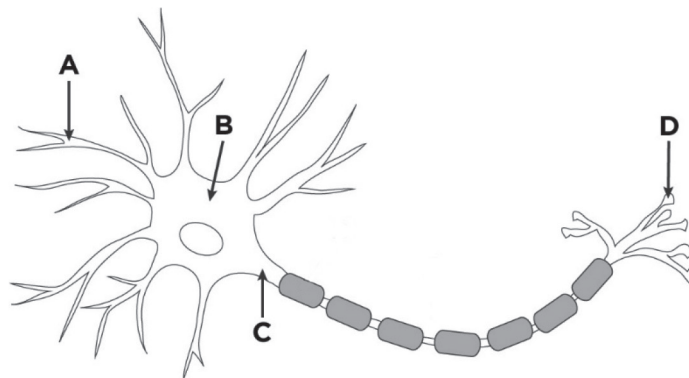
Suggested working time: 30 minutes.

1. In relation to muscle contraction, which statement about the graph below is correct?



- (a) label 1 is force  
 (b) label 1 is velocity  
 (c) label 2 is force  
 (d) label 2 is muscle length
2. A coach is required to analyse movement skills to enhance or improve their athlete's performance. Which statement below identifies correctly the process they would follow?
- (a) preparation, observation, intervention, evaluation  
 (b) intervention, evaluation, preparation, observation  
 (c) evaluation, preparation, observation, intervention  
 (d) preparation, observation, evaluation, intervention

3. Using the diagram below, identify the correct name for each part labelled A to D.

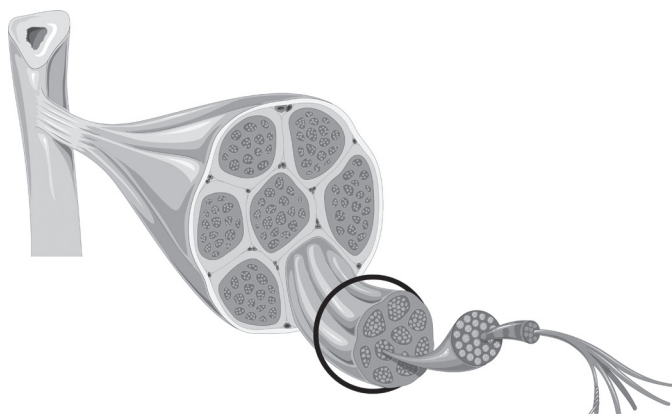


	A	B	C	D
(a)	axon	cell body	dendrites	synapses
(b)	dendrites	cell body	axon	synapses
(c)	dendrites	cell body	synapses	axon
(d)	synapses	axon	cell body	dendrites

4. During an athlete’s off-season, it is highly beneficial for them to

- (a) ensure they taper so that they are in peak performance for pre-season.
- (b) increase their intensity.
- (c) continue increasing their level of fitness.
- (d) allow for rest and recovery while maintaining some fitness levels.

5. What is the name of the skeletal muscle structure circled below?



- (a) epimysium
- (b) muscle fibre
- (c) fascicle
- (d) myofibril

See next page

6. An athlete wishes to join an established netball team. The coach is unaware of the athlete's playing history, including their goals, injuries and performance ability. Which of the strategies below would be the **most** useful for the coach to implement immediately in order to gain a better understanding of this athlete?
- (a) video analysis
  - (b) questionnaire
  - (c) peer feedback
  - (d) the athlete's reflective journal
7. Which of the following is **not** a category of transfer of learning?
- (a) wet weather to dry weather
  - (b) theory to practice
  - (c) training to competition
  - (d) skill to skill
8. An athlete has been playing ultimate frisbee for the last year but is now wanting to join a basketball team. Which of the below **best** identifies the effects of transfer of learning for this athlete?
- (a) zero effects
  - (b) positive effects
  - (c) negative effects
  - (d) bilateral effects
9. Identify the correct statement about the spinning figure skaters below.

For copyright reasons this image cannot be reproduced in the online version of this document but may be viewed at the following link  
<https://kaiserscience.files.wordpress.com/2015/10/angular-momentum-ice-skater.jpeg>

Skater 1 has

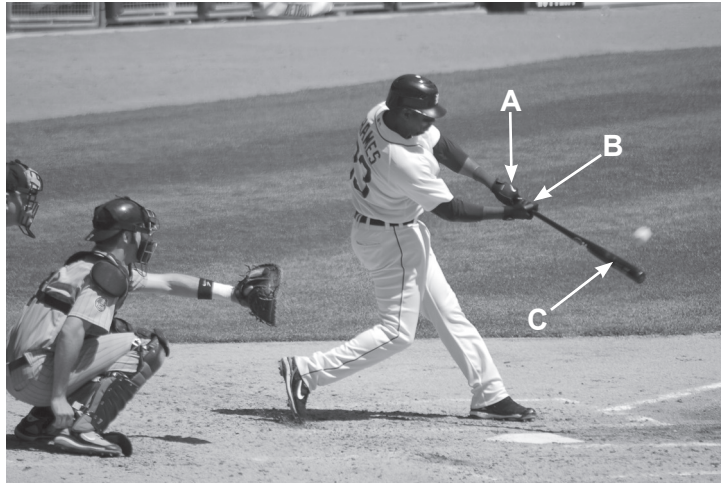
- (a) greater angular momentum than Skater 2.
- (b) less angular momentum than Skater 2.
- (c) greater angular velocity than Skater 2.
- (d) less angular velocity than Skater 2.

See next page

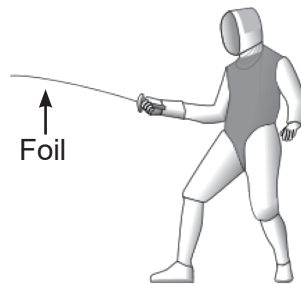
10. Which of the following conditions is present in a high-altitude training environment compared with a sea level environment?
- (a) the air is thin so there is a lower percentage of oxygen
  - (b) the ratio of oxygen to carbon dioxide is lower
  - (c) the ratio of carbon dioxide to oxygen is equal
  - (d) there is less oxygen inhaled per breath
11. Socceros' goalkeeper Andrew Redmayne had to save the penalty kick of his Peruvian opponent for his team to qualify for the soccer World Cup. Which of the following is **most** likely to have applied to Andrew Redmayne in this scenario? He
- (a) used thought stopping to raise his confidence.
  - (b) psyched himself up to increase his motivation.
  - (c) set himself the goal of not making a mistake to improve his stress level.
  - (d) used imagery to reduce his stress level.
12. When an athlete suffers soft tissue damage, which of the following items of training program modification advice is **most** appropriate?
- (a) Increase carbohydrate intake and do specialised activities to improve the injured site, with a focus on interval training.
  - (b) Increase protein intake and do specialised activities to allow rest of the injured site, with a focus on cross training. Ensure that the athlete stays motivated during this time.
  - (c) Increase protein and fat intake; do specialised activities to allow rest of the injured site, with a focus on high intensity interval training method; and ensure the athlete only attends one training session per week.
  - (d) Increase carbohydrate and fat intake and do specialised activities to improve the injured site, with a focus on cross training. Ensure that the athlete stays motivated during this time.
13. In the 2022 Beijing Olympics, Australian Big Air snowboarder Matthew Cox crashed when he was unable to complete the fourth rotation of his jump prior to landing. This is **most** likely because of
- (a) the low moment of inertia.
  - (b) high impulse on take-off.
  - (c) insufficient angular momentum.
  - (d) the influence of air resistance.
14. Athletes seek to gain every advantage over their opponents through training, diet and/or supplements. Which of the following is **not** an advantage of anabolic steroids?
- (a) increases the performer's size, strength and power
  - (b) decreases recovery time
  - (c) increases alertness by raising heart rate
  - (d) stimulates protein synthesis

See next page

15. Third class levers are often used in sports that involve hitting a ball, such as baseball. Which of the answers below identifies correctly the labels A, B and C respectively?



- (a) effort, fulcrum, load  
 (b) fulcrum, effort, load  
 (c) load, effort, fulcrum  
 (d) fulcrum, load, effort
16. Athletes competing in the sport of fencing use a device called a foil, as in the image below. This foil weighs 500 g, which allows the athlete to move and control it with ease in order to strike their opponent in the torso area and score points. This quality of control is due in **most** part to the



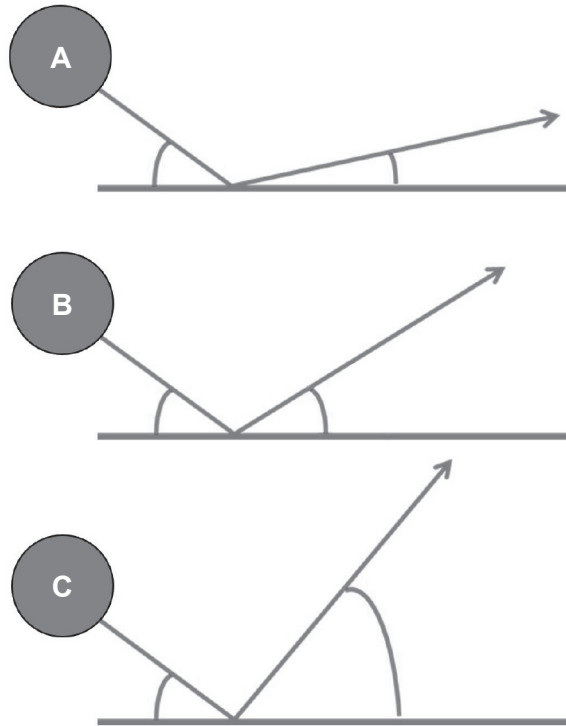
- (a) low moment of inertia of the foil.  
 (b) high moment of inertia of the foil.  
 (c) low angular velocity of the foil.  
 (d) high angular velocity of the foil.
17. Which of the following is **not** a strategy to reduce drag for a freestyle swimmer?
- (a) being as streamlined as possible  
 (b) wearing a swim cap  
 (c) dropping the legs at the hips when kicking  
 (d) keeping the head aligned to the body

See next page

18. A coach is having a difficult time in getting his players to bond and be respectful toward each other. Which of the following strategies would **least** enhance his chances of improving the situation?

- (a) organising social activities outside of normal training periods
- (b) designing team building activities
- (c) initially creating sub-groups so players could get to know each other better
- (d) allowing players to confront each other in an open forum

19. Which statement **best** describes the spin on the balls in the diagrams below?



- (a) ball A has side spin
- (b) ball B has top spin
- (c) ball C has back spin
- (d) they all have no spin

20. An Australian football player is having trouble with her kicking action and is wanting to gain more distance. Her coach has noticed she is quite restricted in her leg movement. Which of the following should her coach focus on **first** to improve her action? The

- (a) player's balance while kicking.
- (b) range of motion at the player's hip.
- (c) way the player drops the ball to kick.
- (d) player's confidence in kicking.

End of Section One

See next page



**Section Two: Short answer****50% (63 Marks)**

This section has **seven** questions. Answer **all** questions. Write your answers in the spaces provided.

Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages to continue an answer, indicate at the original answer where the answer is continued, i.e. give the page number.

Suggested working time: 70 minutes.

**Question 21****(8 marks)**

Complete the table below by filling in the unshaded boxes, to show the characteristics of fast and slow twitch fibres.

Characteristic of fibre	Type I	Type IIa	Type IIb
Colour of fibre			
Muscle fibre size			
Force production			
Resistance to fatigue			
Mitochondrial density			
Capillary density			
Contraction speed			
Activity type			

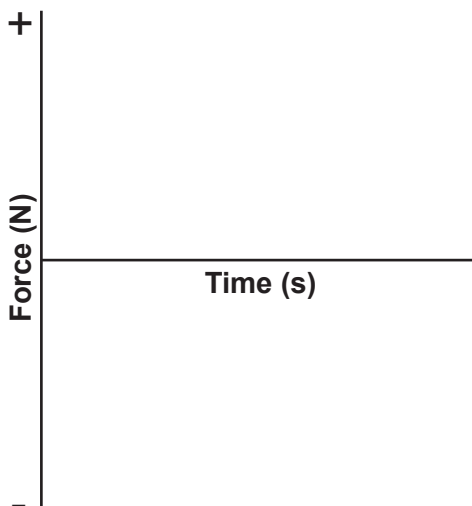
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Question 22

(6 marks)

The ability to perform a vertical jump is important to athletes who compete in sports such as basketball, Australian football or high jump, as they are required to jump as high as possible to either rebound the ball, out mark an opponent or clear the bar.

- (a) On the graph below, draw the outcome of a vertical jump for an athlete jumping as high as possible, from bending their knees, to landing on the ground. (1 mark)



- (b) (i) Name and define the biomechanical principle that is represented by this graph. (2 marks)

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- (ii) Explain how the biomechanical principle named in part (b)(i), is beneficial in preventing injury to athletes landing after a vertical jump. (3 marks)

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## Question 23

(10 marks)

A pair of sport science students are measuring the effect that new baseball bat technology has on how far a ball can be hit. They are comparing a traditional wooden bat with a modern composite metal bat. They control variables by using a machine to swing each bat in the same way every time to hit a stationary ball off a tee at the same angle. The distance at which the ball lands is then measured.

- (a) Define 'coefficient of restitution' and justify how this experiment relates to this principle. (3 marks)

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- (b) Identify **one** factor that can affect the coefficient of restitution and state how it would influence the results of this experiment. (2 marks)

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- (c) Explain why it was important, for the validity of the experiment, for the students to make sure that the force of the bat applied to the ball was kept the same each time. Your answer should refer to Newton's Second Law of Motion. (3 marks)

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**Question 23** (continued)

- (d) If one of the sport science students was to hit the ball off the tee and then have the ball pitched to them by the machine, name and outline what effect this would have on their transfer of learning. (2 marks)

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**Question 24****(9 marks)**

Athletes may use peer feedback, checklists and video to analyse, reflect on and correct their performance.

Outline **two** advantages and **one** disadvantage associated with each of these methods of analysis.

(a) Peer feedback (3 marks)

Advantage one: \_\_\_\_\_

\_\_\_\_\_

Advantage two: \_\_\_\_\_

\_\_\_\_\_

Disadvantage: \_\_\_\_\_

\_\_\_\_\_

(b) Checklists (3 marks)

Advantage one: \_\_\_\_\_

\_\_\_\_\_

Advantage two: \_\_\_\_\_

\_\_\_\_\_

Disadvantage: \_\_\_\_\_

\_\_\_\_\_

(c) Video (3 marks)

Advantage one: \_\_\_\_\_

\_\_\_\_\_

Advantage two: \_\_\_\_\_

\_\_\_\_\_

Disadvantage: \_\_\_\_\_

\_\_\_\_\_

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Question 25

(12 marks)

In 2022, Nedd Brockmann ran from Perth’s Cottesloe Beach to Sydney’s Bondi Beach in 46 days and 12 hours, averaging 84 kilometres per day.

- (a) In relation to the contraction of Nedd’s muscles during his run, outline **six** phases of the sliding filament theory. (6 marks)

One: \_\_\_\_\_

\_\_\_\_\_

Two: \_\_\_\_\_

\_\_\_\_\_

Three: \_\_\_\_\_

\_\_\_\_\_

Four: \_\_\_\_\_

\_\_\_\_\_

Five: \_\_\_\_\_

\_\_\_\_\_

Six: \_\_\_\_\_

\_\_\_\_\_

- (b) Excluding nutritional considerations, outline **two** physiological strategies that Nedd could have implemented to prevent injuries and aid in his recovery. (2 marks)

One: \_\_\_\_\_

\_\_\_\_\_

Two: \_\_\_\_\_

\_\_\_\_\_

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- (c) Using the information below, identify which nutritional plan would benefit Nedd the most in meeting his requirements for this event. Justify your choice. (4 marks)

Nutritional plan 1		Nutritional plan 2	
Carbohydrates	55%	Carbohydrates	60%
Protein	30%	Protein	15%
Fats	15%	Fats	25%

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**Question 26**

**(6 marks)**

During the United Cup Tennis Tournament, players are able to interact with their coaches and fellow teammates. In the 2022 tournament, Australia’s Zoe Hives was able to discuss her game plan and thoughts with her coaches, Lleyton Hewitt and Sam Stosur, during her match.

- (a) Identify the most likely style of leadership suggested by this interaction between Zoe and her coaches. (1 mark)

\_\_\_\_\_

- (b) Outline **five** benefits to Zoe of this style of leadership. (5 marks)

One: \_\_\_\_\_

\_\_\_\_\_

Two: \_\_\_\_\_

\_\_\_\_\_

Three: \_\_\_\_\_

\_\_\_\_\_

Four: \_\_\_\_\_

\_\_\_\_\_

Five: \_\_\_\_\_

\_\_\_\_\_

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**Question 27**

**(12 marks)**

The West Australian Football League Women’s (WAFLW) teams include players from feeder country areas, such as the South West. All players have the same contractual obligations, but training expectations differ slightly, depending on location. As a result, some metropolitan players’ attitudes have declined, as they feel they are putting more effort in than their country counterparts. This creates difficulties for coaching staff in establishing and maintaining team cohesion.

Using Carron’s Model of group cohesion, outline **two** considerations that the coaching staff in this scenario will need to take into account and state a relevant strategy they could use to improve group cohesion for each of the following factors.

(a) Personal (3 marks)

One: \_\_\_\_\_

\_\_\_\_\_

Two: \_\_\_\_\_

\_\_\_\_\_

Strategy: \_\_\_\_\_

\_\_\_\_\_

(b) Environmental (3 marks)

One: \_\_\_\_\_

\_\_\_\_\_

Two: \_\_\_\_\_

\_\_\_\_\_

Strategy: \_\_\_\_\_

\_\_\_\_\_

(c) Leadership (3 marks)

One: \_\_\_\_\_

\_\_\_\_\_

Two: \_\_\_\_\_

\_\_\_\_\_

Strategy: \_\_\_\_\_

\_\_\_\_\_

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(d) Team (3 marks)

One: \_\_\_\_\_

\_\_\_\_\_

Two: \_\_\_\_\_

\_\_\_\_\_

Strategy: \_\_\_\_\_

\_\_\_\_\_

**End of Section Two**

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## ACKNOWLEDGEMENTS

- Question 3** Adapted from: Henley, C. (2021). *Postsynaptic Cell* [Diagram]. Retrieved May, 2023, from <https://openbooks.lib.msu.edu/neuroscience/chapter/the-neuron/>
- Question 5** Adapted from: Servier Medical Art. (2013). *Structure of Tendon* [Diagram]. Retrieved April, 2023, from <https://www.flickr.com/photos/serviermedicalart/9913707915/in/album-72157635835026636/>  
Used under Creative Commons Attribution 2.0 Generic licence.
- Question 9** Pearson Education. (2004). [Diagram of ice skaters showing motion]. Retrieved April, 2023, from [https://kaiserscience.files.wordpress.com/2015/10/\[...\]-ice-skater.jpeg](https://kaiserscience.files.wordpress.com/2015/10/[...]-ice-skater.jpeg)
- Question 15** Philpott, M. (2007). *Marcus Thames Tigers 2007* [Photograph]. Retrieved April, 2023, from [https://commons.wikimedia.org/wiki/File:Marcus\\_Thames\\_Tigers\\_2007.jpg](https://commons.wikimedia.org/wiki/File:Marcus_Thames_Tigers_2007.jpg)  
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- Question 16** Wolfe, S. (2007). *Fencing Foil Valid Surfaces* [Clipart]. Retrieved April, 2023, from [https://www.newworldencyclopedia.org/entry/File:Fencing\\_foil\\_valid\\_surfaces.svg](https://www.newworldencyclopedia.org/entry/File:Fencing_foil_valid_surfaces.svg)  
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