



ATAR course examination, 2021

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

Number of additional
answer booklets used
(if applicable):

Time allowed for this paper

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

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.

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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	62	50
Section Three Extended answer	4	2	50	30	30
Total					100

Instructions to candidates

- The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2021: Part II Examinations*. Sitting this examination implies that you agree to abide by these rules.

- Write your answers in this Question/Answer booklet preferably using a blue/black pen. Do not use erasable or gel pens.

- 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. 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.

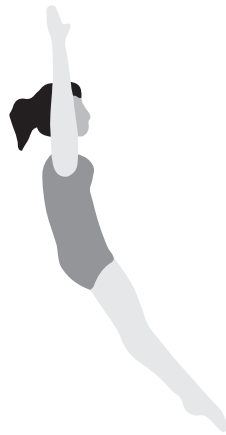
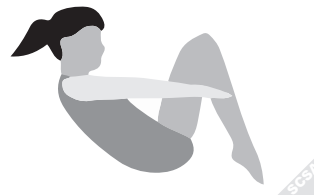
- You must be careful to confine your answers to the specific questions asked and to follow any instructions that are specific to a particular question.
- Supplementary pages for planning/continuing your answers to questions are provided at the end of this Question/Answer booklet. If you use these pages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

See next page

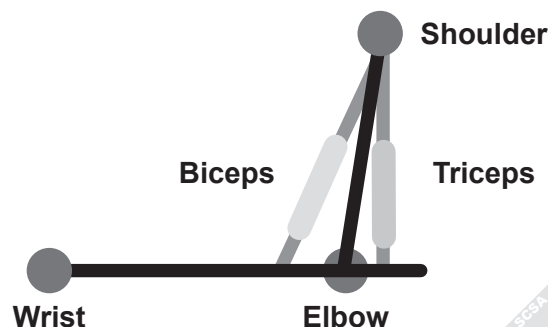
Section One: Multiple-choice**20% (20 Marks)**

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.

**Layout****Tuck**

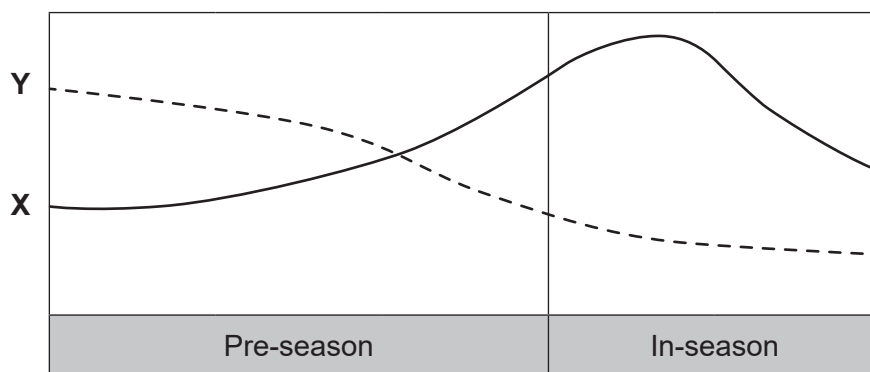
1. During a vault routine, a gymnast moves from a layout to a tuck position and back into a layout to land. In this routine, the angular momentum will
- alternate from large to small to large.
 - alternate from small to large to small.
 - be non-existent.
 - remain the same.



2. Above is a schematic diagram of the human elbow. Which statement is correct?
- A bicep curl uses a first-class lever.
 - A tricep extension uses a first-class lever.
 - A bicep curl uses a second-class lever.
 - A tricep extension uses a second-class lever.

See next page

3. According to the sliding filament theory, when a muscle fibre shortens, which of the following also shortens?
- (a) actin
 - (b) myosin
 - (c) sarcomere
 - (d) Z-line
4. During a muscle contraction, the cross-bridge cycle, whereby myofilaments are continuously detached and reattached, occurs. What is the major chemical involved in making the detachment occur?
- (a) ATP
 - (b) ADP
 - (c) calcium
 - (d) tropomyosin
5. For the training program below, what does the line labelled 'X' represent?



- (a) intensity
 - (b) duration
 - (c) frequency
 - (d) volume
6. Identify the correct reason why a golf ball is made with dimples.
- (a) The boundary layer separates later, causing a decrease in form drag.
 - (b) The boundary layer separates later, causing an increase in form drag.
 - (c) The boundary layer separates earlier, causing a decrease in form drag.
 - (d) The boundary layer separates earlier, causing an increase in form drag.
7. To **reduce** social loafing in a team environment, a coach would
- (a) make tasks and drills more challenging and difficult.
 - (b) identify key performance indicators for each team member.
 - (c) mix groups so players are with unfamiliar team-mates.
 - (d) mix groups so players are with a large number of team-mates.

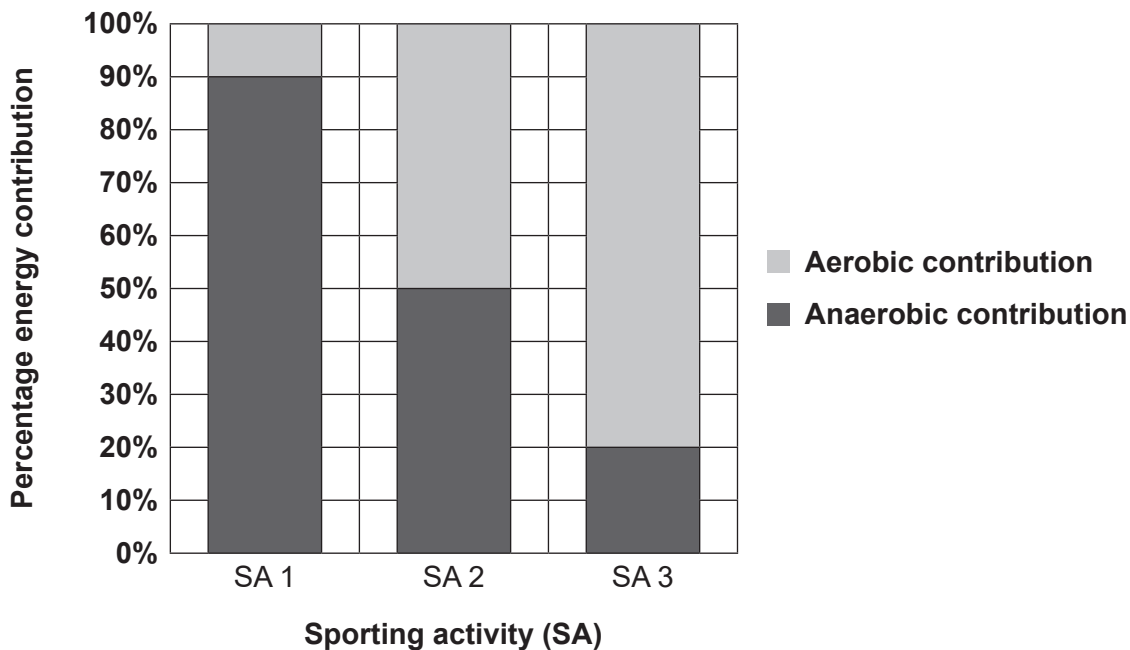
8. To teach hurdles to a beginner track athlete, a coach breaks up the skill and uses the following individual drills:

1. lead leg → 2. trail leg → 3. stepping between hurdles → 4. run the event.

What is this coaching activity called?

- (a) chaining
 - (b) simple to complex
 - (c) whole-part-whole
 - (d) shaping
9. A rugby player has just completed a high intensity running session. Which of the following snacks would be **least** beneficial to the player if eaten immediately after the session?
- (a) jam sandwich with a glass of water
 - (b) some lollies with a sports drink
 - (c) chicken and salad with a glass of water
 - (d) muesli bar with a sports drink
10. You are a coach of an under-13 hockey team and they have not been performing well during games. Which of the following categories of transfer of learning would you try to incorporate that would be of **most** benefit for the team?
- (a) skill to competition
 - (b) practice to theory
 - (c) training to competition
 - (d) skill to skill
11. In the lead-up to an event, an élite endurance athlete would increase their carbohydrate intake. This process, also known as 'carbohydrate loading',
- (a) requires no change to training load leading up to the event.
 - (b) increases muscle glycogen stores prior to the race.
 - (c) is intended to prolong the use of fats as the major fuel source.
 - (d) requires an increase to training load leading up to the event.

12. The graph below shows energy contributions for various sporting activities.

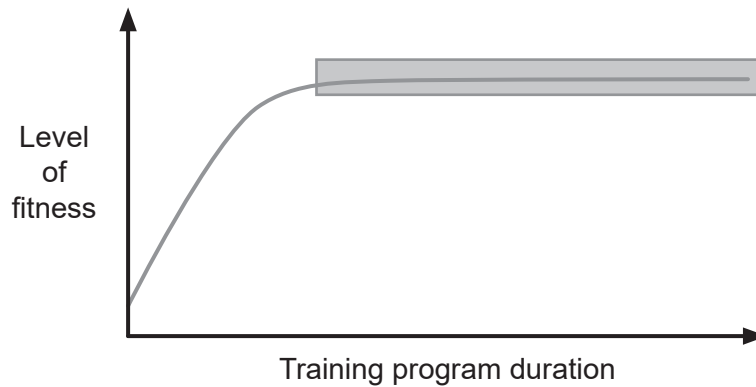


Match the sporting activity (SA) with the correct track event.

	SA1	SA2	SA3
(a)	100 m	400 m	5000 m
(b)	5000 m	100 m	400 m
(c)	1000 m	400 m	5000 m
(d)	100 m	5000 m	400 m

13. There is evidence from research that suggests the stimulant caffeine can enhance performance in high-intensity exercise of a short duration (of up to five minutes). This performance enhancement is **most** likely due to

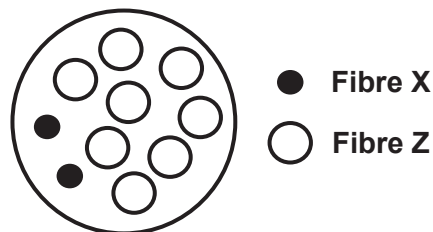
- (a) increased glycogen-storing capacity.
- (b) increased reaction time.
- (c) decreased release of adrenaline.
- (d) decreased perception of fatigue or effort.



14. What does the shaded area on the graph above **best** represent?
- peaking
 - recovery
 - maintenance
 - overtraining
15. Which biomechanical concept is the skater below applying when he pushes against the ground to keep the board moving?



- inertia
 - balance
 - spin
 - torque
16. The diagram below is a cross-sectional sample of skeletal muscle viewed under a microscope.

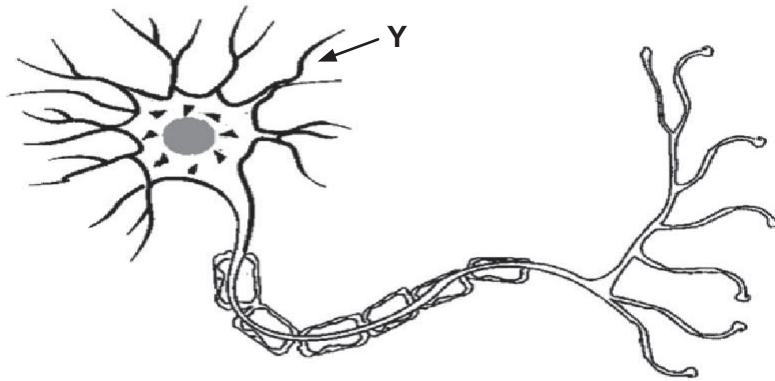


Which statement is correct?

- Fibre X is Type II and the sample belongs to a triathlete.
- Fibre Z is Type II and the sample belongs to a long jumper.
- Fibre X is Type I and the sample belongs to a 50 m swimmer.
- Fibre Z is Type I and the sample belongs to a 5000 m runner.

See next page

17. Which statement is the **most** correct in reference to the coefficient of restitution of a ball that is bouncing?
- (a) velocity before and after the bounce is the same
 - (b) velocity before is greater than after the bounce
 - (c) velocity before is less than after the bounce
 - (d) velocity is irrelevant
18. What is the name of the part of the diagram labelled 'Y'?



- (a) axon
 - (b) dendrite
 - (c) motor unit
 - (d) nucleus
19. Which is the **best** method a coach could use to evaluate a gymnast's performance to detect errors?
- (a) reflective journal
 - (b) questionnaire
 - (c) video analysis
 - (d) heart rate monitor
20. Piloerection (goose bumps) occurs when an athlete performs under what conditions?
- (a) humid
 - (b) hot
 - (c) altitude
 - (d) cold

End of Section One

See next page

Section Two: Short answer

50% (62 Marks)

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

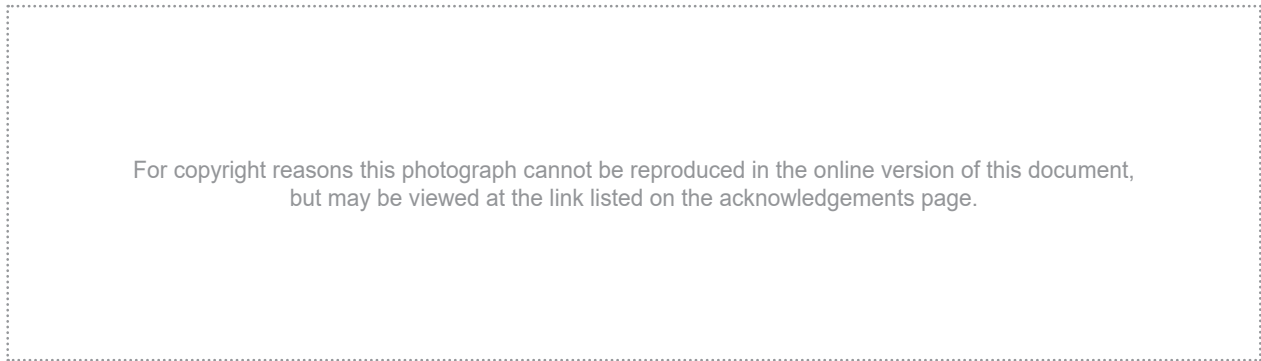
Use a blue or black pen (**not** pencil) for this section.

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

(6 marks)



Damon Heta is a professional darts player from Western Australia. On 19 January 2020, he won a two-year Professional Darts Corporation tour card to play on the Pro Tour.

In the space provided, draw a graph of the force-length for muscle contraction and explain its application to the starting position as indicated in the above dart-throwing progression.

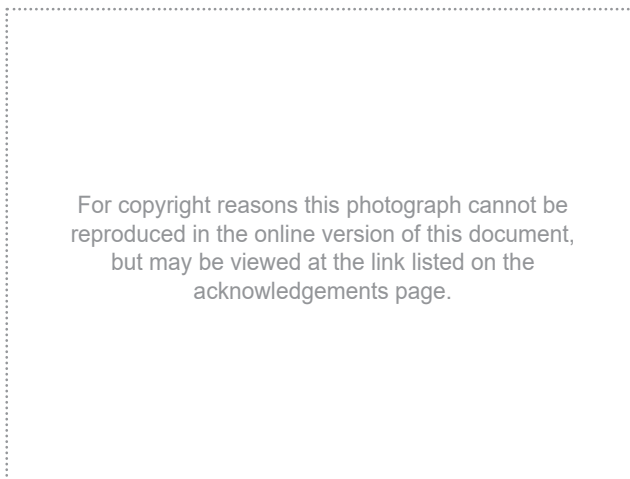


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Question 22

(10 marks)



Australia’s national rugby union team, the Wallabies, ended 2020 by drawing with Argentina for their third drawn game from six Tests for that year. All three draws had Reece Hodge miss a late penalty kick that would have sealed a win for Australia. Relaxation is a mental skill strategy Reece could have used to assist him to be more successful with his penalty kicks.

(a) (i) Define ‘relaxation’. (2 marks)

(ii) Name and outline **one** relaxation technique and how it would assist Reece to be more successful with his penalty kicks. (3 marks)

When kicking for goal, Reece needs to apply the biomechanical principle of force-motion.

- (b) (i) Define Newton's Second Law of Motion. (2 marks)

- (ii) Outline **three** ways in which Newton's Second Law of Motion would assist Reece to kick the ball for distance. (3 marks)

One: _____

Two: _____

Three: _____

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Question 23

(9 marks)

Due to unforeseen circumstances in 2020–2021, many Australian professional sports organisations had to restructure their competitions. Clubs were grouped together and relocated to different parts of Australia to live in ‘hubs’ within which they had to train, eat, sleep and play. Hub life saw players away from their families and friends for extended periods and play matches without crowds. It also saw a number of players break the strict hub rules.

- (a) Define the term ‘group cohesion’. (1 mark)

- (b) Describe **four** strategies coaches could have used to ensure that positive group cohesion occurred within their teams during their time in the hub. (8 marks)

One: _____

Two: _____

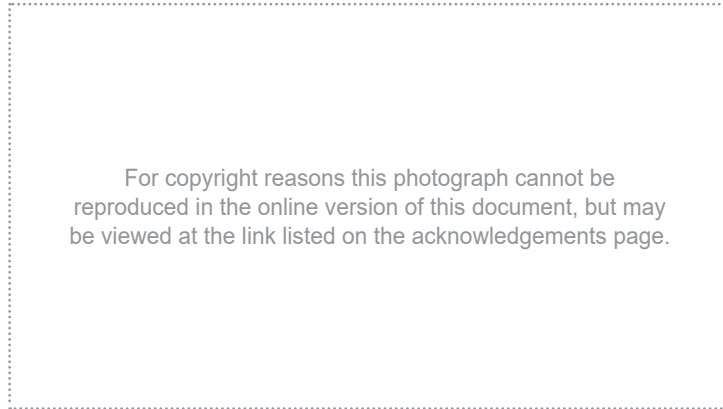
Three: _____

Four: _____

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Question 24

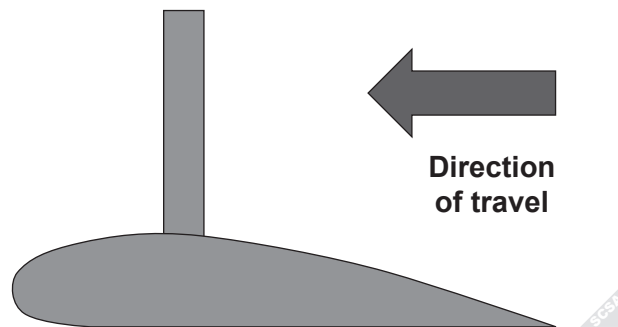
(10 marks)



The most recent America's Cup (March 2021) was raced in New Zealand with the AC75 class of boat, a hydrofoil monohull. When the boat's velocity increases, it is elevated out of the water.

- (a) Name the biomechanical concept a winged keel is designed around. (1 mark)

- (b) Label the diagram below and explain how the principle from part (a) works to increase the velocity of the boat. (9 marks)



See next page

Question 25

(10 marks)

Australian runner, Sinead Diver, ran the third fastest marathon for an Australian female at the London Marathon in 2019.

- (a) (i) Define the term 'peaking'. (2 marks)

- (ii) Describe how Sinead could ensure 'peaking' occurs in her training. (2 marks)

- (b) List **three** ways in which Sinead could adjust her fitness training for the two weeks before a marathon. (3 marks)

One: _____

Two: _____

Three: _____

A golfer is preparing for a golf tournament.

- (c) Would the golfer adjust their training program in the same way Sinead has to prepare for a marathon? Justify your response. (3 marks)

See next page

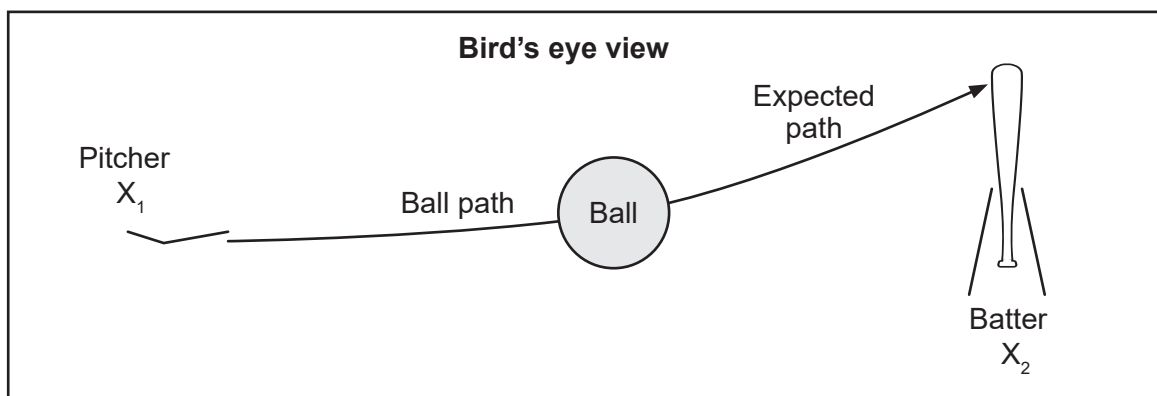
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Question 26

(9 marks)

In January 2021, Western Australian, Liam Hendriks, became the highest paid relief pitcher in American Major League Baseball when he signed up with the Chicago White Sox. He can throw many types of pitches to attempt to deceive the batter by changing the type of spin on the ball.

- (a) On the ball below, draw the direction of the spin for a right-handed curveball pitch moving away from the right-handed hitter. (1 mark)



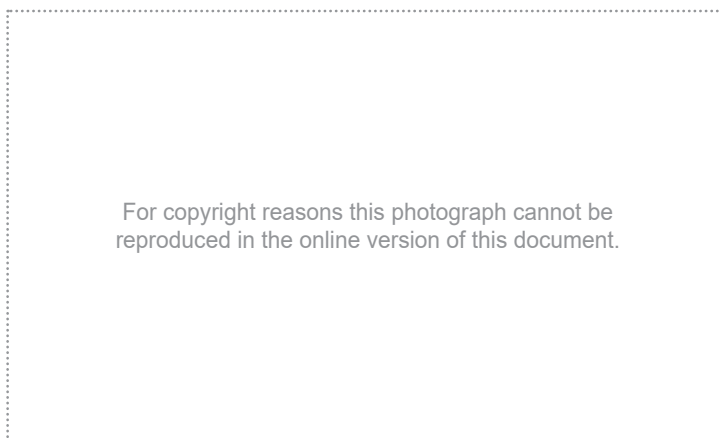
- (b) Explain the biomechanics behind how the curveball moves away from a right-handed hitter. (8 marks)

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Question 27

(8 marks)

In the condensed 2020 AFL season, teams had shorter breaks between matches. Carlton's co-captain, Patrick Cripps, sustained a corked thigh playing against Collingwood and had four days recovery time before he was due to play against Greater Western Sydney.



- (a) A recovery strategy Carlton employed for the team in their four-day break was having sessions of pool running, similar to the image shown above. Outline **two** ways in which this therapy would assist the player's recovery. (2 marks)

One: _____

Two: _____

- (b) (i) Name and outline **two** other recovery methods Patrick could have used as part of his recovery. (4 marks)

One: _____

Two: _____

See next page

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- (ii) For each recovery method in part (b)(i), outline a benefit to Patrick of using this method. (2 marks)

One: _____

Two: _____

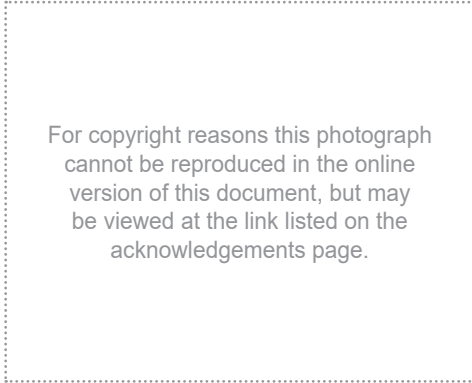
End of Section Two

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See next page

Question 29

(15 marks)



On 16 April 2019, Belgian cyclist, Victor Campenaerts, set a World Record of 55.089 km for the longest distance cycled in an hour. In preparation for his record attempt, Campenaerts slept in an altitude tent that simulated a height of 3000 m.

- (a) Describe why Campenaerts slept in the tent. Identify and outline **four** physiological adaptations that would improve his chances of breaking the world record. (10 marks)

See next page

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Question 30

(15 marks)

- (a) Draw and label a diagram showing the **five** key structures of skeletal muscle and outline each structure. (10 marks)

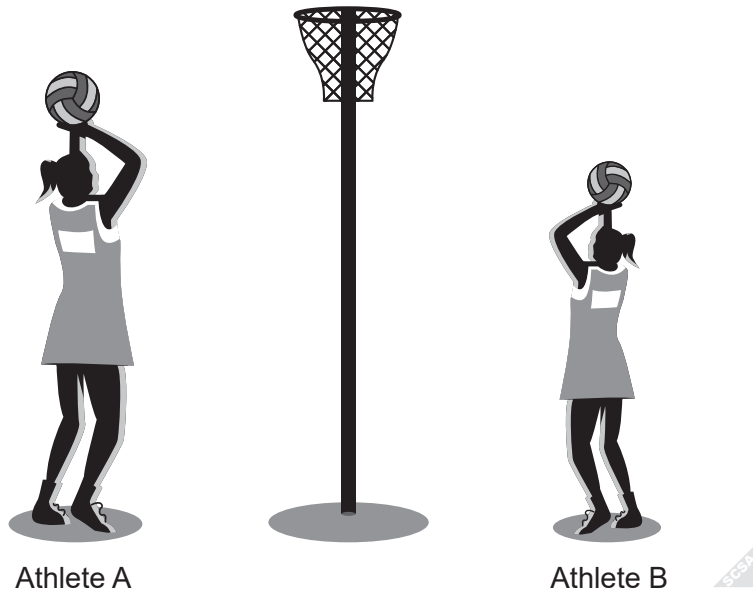
Diagram of skeletal muscle

See next page

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Question 31

(15 marks)



The image above is of two netball players ready to shoot for goal. Athlete A is taller than Athlete B. Both players are the same distance away from the goal.

- (a) Define 'optimal projection' and explain how it would affect both the players' shots for goal. (5 marks)

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Supplementary page

Question number: _____

Multiple horizontal lines for writing.

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ACKNOWLEDGEMENTS

- Question 15** Ylev. (n.d.). *Skateboard* [Photograph]. Retrieved April, 2021, from <https://search.creativecommons.org/photos/6731a2c1-b119-483a-b403-38bd5c0c1226>
Used under a Creative Commons Attribution 2.0 Generic licence.
- Question 18** Hayes, N. (2017). ... [Diagram]. Retrieved April, 2021, from <https://pixabay.com/vectors/> ...
- Question 21** Adapted from: Jimsy. (n.d.). *Person who darts* [Diagram]. Retrieved May, 2021, from <https://www.pixtastock.com/illustration/35040500>
- Question 22** Adapted from: Cornaga, A. (2020). [Photograph of Reece Hodge's penalty kick in Bledisloe Cup match Wellington]. Retrieved May, 2021, from <https://www.abc.net.au/news/2020-11-05/bledisloe-cup-wallabies-to-start-reece-hodge-against-all-blacks/12852122>
- Question 24** Adapted from: Craig, M. (2020). [Photograph of Italy's Luna Rossa yacht competing in the America's Cup World Series]. Retrieved April, 2021, from <https://apnews.com/article/mlb-sailing-auckland-sports-asia-new-zealand-edb3704cefe5d9dc43cd19e39eb0268a>
- Question 27** Adapted from: [Photograph of man aqua jogging]. (n.d.). Retrieved April, 2021, from <https://www.flrunning.com/blog/cross-training-in-the-water-with-aqua-jogging-14143>
- Question 29** [Photograph of Victor Campenaerts breaking UHI hour record]. (2019). Retrieved May, 2021, from https://www.slowlitch.com/articles/images/1/179701-largest_Campenaerts_hour1.png

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