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External Assessment 2026

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# SPORT SCIENCE

SPT315126

## Section A Exercise Physiology

Pages: 20

Questions: 7

**Preparation time for this exam:** 15 minutes

**Suggested working time:** 60 minutes

**Instructions:**

- Answer **all** questions and **all** items within each question.
- Write your answers in the spaces provided in this exam paper.
- The exam is **two (2) hours and thirty (30) minutes** in length. The suggested working time for this section is **approximately 60 minutes**.
- All answers must be written in **English**.
- You **must** make sure your answers address the listed criteria.

| Marker use | |
|---|---|
| C1 | / 25 |
| C2 | / 25 |
| C5 | / 10 |

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# Guide to Exam Structure

| | Questions available | Questions to answer | Suggested working time | Marks available |
|---|---|---|---|---|
| Section A | 7 | 7 | 60 minutes | 60 marks |
| Section B | 4 | 4 | 45 minutes | 45 marks |
| Section C | 4 | 4 | 45 minutes | 45 marks |
| **Totals** | **15** | **15** | **150 minutes (2.5 hours)** | **150 marks** |

# Criteria

You **must** make sure your answers address:

- Criterion 1 describe and analyse physiological aspects of exercise
- Criterion 2 analyse and explain physiological responses to training and recovery
- Criterion 5 analyse and interpret sport science data and information.

**Question 1**

Marker use

This question assesses **Criterion 1**.

Kate Moloney is vice-captain and a consistent performer for the Melbourne Vixens in an Australian Netball League. She plays in the positions of centre and wing defence. Kate is required to perform repeated high-intensity efforts including short sprints, rapid changes of direction, jumps, and passes.



*Figure 1*

a) What is the role of ATP?

/1

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b) State how long **stored** ATP lasts in the muscles.

/1

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c) Describe the process of ATP resynthesis using phosphocreatine (PCr), you may use a diagram.

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d) Explain how the energy continuum would be applied to Kate in a game of netball.

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**Total Q1**

/7

**Question 2**

Marker use

This question assesses **Criterion 1**.

Jessica Morrison is a world-class Australian rower who competes in the 2,000 m rowing event. The event lasts approximately 6–8 minutes and requires both strength and endurance.



*Figure 2*

a) Define steady state during a sporting performance. /1

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b) State how oxygen is transported in the blood. /1

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c) Identify **two (2)** acute muscular adaptations to training. /1

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d) Outline the advantage of having a lactate inflection point (LIP) occur at a higher percentage of $VO_2$ max for a rower. /2

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**Question 2 continues**

Marker use

e) Identify **two (2)** chronic circulorespiratory adaptations and outline how they help maintain performance during a 2,000 m rowing race.

/3

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**Total Q2**

/8

**Question 3**

Marker use

This question assesses **Criterion 1**.

The Socceroos qualified for the 2026 FIFA World Cup, with a 2–1 victory over Saudi Arabia in June 2025. For soccer players this requires contributions from both anaerobic and aerobic energy systems.



*Figure 3*

a)

i. Identify the main fuel used by midfield players during energy production in a soccer match. /1

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ii. Identify the **two (2)** by-products produced during the electron transport chain (ETC) and state how they are removed from the body. /2

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b) A soccer player has a relative $VO_2$ max of 60 ml/kg/min and a body mass of 70 kg. Calculate their absolute $VO_2$ max, showing your working. /2

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**Question 3 continues**

Marker use

c) Define arteriovenous oxygen difference (a-v$O_2$ diff) and state what **two (2)** gases are involved in the process.

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d) Explain how oxygen deficit occurs and how it can affect performance during high-intensity exercise.

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**Total Q3**

/10

**Total C1**

/25

**Question 4**

Marker use

This question assesses **Criterion 2**.

Jay Vine is currently Australia's top ranked road cyclist. Road cyclists compete over distances ranging from 25 km to 250 km. To compete against the best cyclists in the world, Jay is required to have a structured training regime.




*Figure 4*

a) Identify the most common training method Jay would engage in. /1

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b) What type of peaking is appropriate for a top level road cyclist? /1

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c) Outline how periodisation helps an elite cyclist achieve peak performance. /2

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**Question 4 continues**

Marker use

d) Define EPOC and outline the role it plays in the body after a training session for a cyclist.

/3

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**Total Q4**

/7

**Question 5**

Marker use

This question assesses **Criterion 2**.




Charisma Amoe-Tarrant is recognised as one of Australia's top female super-heavyweight weightlifters. She represented Australia at the Tokyo 2020 Olympics and won a bronze medal in the +87kg category at the 2022 Commonwealth Games.

*Figure 5*

a) Define the fitness component of body composition. /1

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b) Define flexibility and outline why it would be an important part of a weightlifter's overall program. /2

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c)

i. Identify **four (4)** different training variables for resistance training. /2

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**Question 5 continues**

Marker use

ii. Select **two (2) of** your answers to item c) i. and for each of these, list a way the weightlifter might implement tapering before a major event like the Olympic Games.

/1

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d) Identify **four (4)** key components weightlifting athletes and their coaches must take into consideration when planning an annual training plan.

/2

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**Total Q5**

/8

**Question 6**

Marker use

This question assesses **Criterion 2**.



The National Rugby League's showpiece event the State of Origin is played between New South Wales and Queensland every year during a 6-week period in the middle of the NRL season. Player training loads are monitored very closely during this time period.

*Figure 6*

a) Identify **one (1)** method used to measure intensity during a field training session. /1

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b) Identify and justify **two (2)** fitness components important for rugby league players when tackling opponents. /2

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c)

i. What is the intention of engaging in an active recovery? /2

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**Question 6 continues**

Marker use

ii. Describe what an active recovery might entail after a game for a rugby league player.

/1

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d) Define overtraining and outline how poor management of training loads may lead to this for State of Origin players.

/2

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e) With appropriate timings, discuss the nutritional replenishment guidelines after a game for a sport like rugby league.

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**Total Q6**

**/10**

**Total C2**

**/25**

## Question 7

Marker use

This question assesses **Criterion 5**.

Figure 7 provides a representation of fuel utilisation during a marathon.

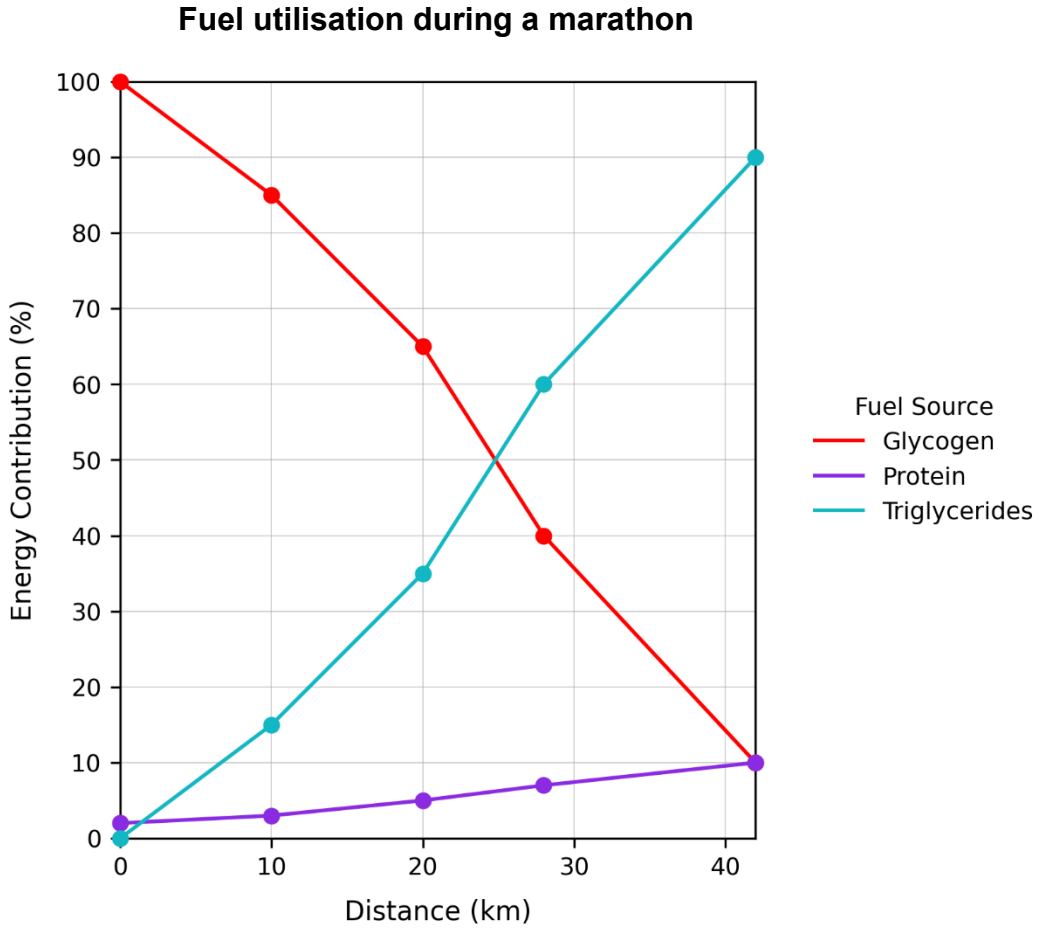



*Figure 7*

a) Identify the percentage contribution of glycogen at 35 km.

/1

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b) What is the approximate difference in energy contribution between glycogen and triglycerides at 30 km?

/1

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**Question 7 continues**

Marker use

c) Identify the approximate distance where triglyceride contribution exceeds 75%.

/1

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d) Using data from Figure 7, explain why protein contribution increases as the race progresses.

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e) Using data from Figure 7, analyse the significance of the crossover point for fuel utilisation and endurance performance.

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f) Using data from Figure 7, analyse how oxygen demand would change over the course of the marathon as fuel utilisation shifts.

/2

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**Total Q7/C5**

/10

# Acknowledgements

**Sources:**

**Figure 1**

Siren Sport. (n.d.). *Melbourne Vixen Kate Moloney on leadership and the changing landscape of women's sport* [Photograph]. *Siren Sport*. https://sirensport.com.au/netball/melbourne-vixen-kate-moloney-on-leadership-and-the-changing-landscape-of-womens-sport/

**Figure 2**

The Cairns Post. (2021). *Aussie rowers fight heat and nerves at Sea Forest Waterway* [Photograph]. *The Cairns Post*. https://www.cairnspost.com.au/sport/olympics/tokyo-olympics-2021-aussie-rowers-fight-heat-and-nerves-at-sea-forest-waterway/news-story/399951c8f53768b986e2f654666d1581

**Figure 3**

Olympics.com. (n.d.). *FIFA World Cup 2026 AFC qualifiers: Australia results and scores* [Photograph]. *Olympics.com*. https://www.olympics.com/en/news/fifa-world-cup-2026-football-afc-qualifiers-australia-results-scores

**Figure 4**

The Australian. (n.d.). *Jay Vine finishes fifth in time trial at cycling world championships after crash* [Photograph]. *The Australian*. https://www.theaustralian.com.au/breaking-news/jay-vine-finishes-fifth-in-time-trial-at-cycling-world-championships-after-crash/news-story/7c84186cfc49204be910e0fc09f5b3d3

**Figure 5**

Australian Broadcasting Corporation. (2022, August 3). *Eileen Cikamatana becomes first woman to win Commonwealth Games gold for two countries* [Photograph]. *ABC News*. https://www.abc.net.au/news/2022-08-03/eileen-cikamatana-first-woman-win-gold-two-countries/101296900

**Figure 6**

National Rugby League. (2020, October 26). *Everything you need to know: State of Origin 2020* [Photograph]. *NRL.com*. https://www.nrl.com/news/2020/10/26/everything-you-need-to-know-state-of-origin-2020/

End of Section A

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# SPORT SCIENCE

SPT315126

## Section B Skill Acquisition

Pages: 16

Questions: 4

**Suggested working time:** 45 minutes

**Instructions:**

- Answer **all** questions and **all** items within each question.
- Write your answers in the spaces provided in this exam paper.
- The exam is **two (2) hours and thirty (30) minutes** in length. The suggested working time for this section is **approximately 45 minutes**.
- All answers must be written in **English**.
- You **must** make sure your answers address the listed criteria.

| Marker use | |
|---|---|
| C3 | / 35 |
| C5 | / 10 |

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# Guide to Exam Structure

| | Questions available | Questions to answer | Suggested working time | Marks available |
|---|---|---|---|---|
| Section A | 7 | 7 | 60 minutes | 60 marks |
| Section B | 4 | 4 | 45 minutes | 45 marks |
| Section C | 4 | 4 | 45 minutes | 45 marks |
| **Totals** | **15** | **15** | **150 minutes (2.5 hours)** | **150 marks** |

# Criteria

You **must** make sure your answers address:

- Criterion 3 analyse and discuss concepts of skill acquisition in sport
- Criterion 5 analyse and interpret sport science data and information.

**Question 8**

Marker use

This question assesses **Criterion 3**.

The Tasmanian JackJumpers were eliminated in the first week of the NBL finals by Melbourne United in season 2025–2026. Coach Scott Roth mentioned the side's inability to execute skills under pressure as one of the reasons for the loss.




*Figure 8*

a) What are the **two (2)** characteristics of a skilled movement? /1

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b) Outline **two (2)** ways in which feedback could help improve the JackJumpers' performance. /2

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c) Identify the most appropriate ways the motor skill of shooting a three-point shot in a game situation under pressure could be classified. /1

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d) With an appropriate definition, outline how Hick's Law could be applied to a game of basketball. /2

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**Question 8 continues**

Marker use

e) Compare two basketballers, with one in the associative and one in the autonomous stage of skill learning, regarding their ability to perform under pressure. /2

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f)

i. Identify the most appropriate method of practice for executing skills under pressure. /1

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ii. Discuss **three (3)** reasons why this is the most appropriate practice method. /3

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**Total Q8** /12

**Question 9**

Marker use

This question assesses **Criterion 3**.

Nelly Korda is one of the world's best female golfers. Her golf swing is regarded as one of the best in the world.



*Figure 9*

a) What source of feedback is provided when a golfer feels the contact between the club and ball? /1

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b) Identify the type of practice method of a golfer repeatedly hitting the same shot at a golf range. /1

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c) Fill in the gaps in Table 1. /4

| Feedback example | Nature of feedback | Practical golf example |
|---|---|---|
| **Outcome of golf shot** | | |
| **Receiving advice on the execution of a golf swing** | | |

*Table 1*

**Question 9 continues**

Marker use

d) Describe how the different memory systems (STSS, STM, LTM) contribute to Korda's performance.

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e) Identify and explain how the different components of the information processing model contribute to elite performance in golf.

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**Total Q9**

/12

**Question 10**

Marker use

This question assesses **Criterion 3**.

Albin Ouschan is currently ranked the best billiards player in the world. Billiards is a sport that requires great skill and strategy. It is a type of cue sport, which also includes snooker, pool or 8-ball.



*Figure 10*

a) Classify a shot in a cue sport in terms of environmental predictability. Justify your response with **two (2)** reasons. /2

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b) Explain how all **three (3)** of Newton's laws could be applied to a cue sport shot. /3

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**Question 10 continues**

Marker use

c) With specific reference to a cue sport, outline **three (3)** benefits of video analysis.

| Benefit | Explanation |
|---|---|
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*Table 2*

/3

d) In terms of levers when executing a cue sport shot, what joint would be the axis point?

/1

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e) What anatomical movement occurs at the axis point during the follow through of a cue sport shot?

/1

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f) What type of stability is most appropriate for cue sports?

/1

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**Total Q10**

/11

**Total C3**

/35

**Question 11**

Marker use

This question assesses **Criterion 5**.

A cohort of elite and recreational tennis players underwent a tennis-specific reaction time test. Table 3 shows reaction times in milliseconds (ms) for elite and recreational tennis players across different ages. Reaction time reflects perceptual-motor skill and decision-making ability in tennis.

| Age | Elite time (ms) | Recreational time (ms) |
|---|---|---|
| 16 | 170 | 190 |
| 17 | 165 | 185 |
| 18 | 160 | 180 |
| 19 | 155 | 178 |
| 20 | 150 | 175 |
| 21 | 147 | 170 |
| 22 | 144 | 168 |
| 23 | 142 | 166 |
| 24 | 140 | 165 |
| 25 | 142 | 167 |
| 26 | 143 | 168 |
| 27 | 144 | 169 |
| 28 | 145 | 170 |
| 29 | 147 | 175 |
| 30 | 148 | 178 |
| 31 | 146 | 179 |
| 32 | 150 | 178 |
| 33 | 152 | 185 |
| 34 | 155 | 188 |

*Table 3: Comparison of reaction times in milliseconds between elite and recreational performers from ages 16 to 34.*

a) Outline the difference in reaction time at age 24. /1

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b) Describe the trend in reaction time across ages for both groups. /1

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**Question 11 continues**

Marker use

c) Identify the group that has the better reaction time. Justify with data from Table 3.

/2

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d) Explain how selective attention may contribute to the difference in times between the elite and recreational players. Explain with reference to the data in Table 3.

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e) At what ages are the elite and recreational tennis players demonstrating peak performance reaction times.

/2

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f) Identify the irregularity in the dataset for the elite players.

/1

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**Total Q11/C5**

/10

# Acknowledgements

**Sources:**

**Figure 8**

ESPN Australia. (n.d.). *NBL Mini: Melbourne United vs. Tasmania JackJumpers | Extended highlights* [Video]. *YouTube*. https://www.youtube.com/watch?v=Pvtiv3KARNU

**Figure 9**

National Club Golfer. (n.d.). *Nelly Korda: What's in the bag?* [Photograph]. *National Club Golfer*. https://www.nationalclubgolfer.com/tour/witb/nelly-korda-witb/

**Figure 10**

Hofstaetter, M. (2012, March). *Making history: Albin Ouschan wins Eurotour in Sarajevo* [Photograph]. *Markus Hofstaetter Photography Blog*. https://blog.markus-hofstaetter.at/2012/03/making-history-albin-ouschan-wins-eurotour-in-sarajevo/

End of Section B

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# SPORT SCIENCE

SPT315126

## Section C Sport Psychology

Pages: 16

Questions: 4

**Suggested working time:** 45 minutes

**Instructions:**

- Answer **all** questions and **all** items within each question.
- Write your answers in the spaces provided in this exam paper.
- The exam is **two (2) hours and thirty (30) minutes** in length. The suggested working time for this section is **approximately 45 minutes**.
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| Marker use | |
|---|---|
| C4 | / 35 |
| C5 | / 10 |

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|---|---|---|---|---|
| Section A | 7 | 7 | 60 minutes | 60 marks |
| Section B | 4 | 4 | 45 minutes | 45 marks |
| Section C | 4 | 4 | 45 minutes | 45 marks |
| **Totals** | **15** | **15** | **150 minutes (2.5 hours)** | **150 marks** |

# Criteria

You **must** make sure your answers address:

- Criterion 4 examine and discuss how sport psychology influences athletic performance
- Criterion 5 analyse and interpret sport science data and information.

**Question 12**

Marker use

This question assesses **Criterion 4**.



*Figure 11*

Danielle Scott is an Australian who competes in freestyle skiing. Throughout her career she has suffered many injury setbacks including serious knee injuries. After initially being overlooked as Australia's first choice at the Milano Cortina 2026 Winter Olympics, she ended up winning a silver medal after Australia's first choice Laura Peel withdrew from the competition.

Freestyle skiing is completed individually and involves athletes projecting themselves off ramps at speed in order to complete various twists and turns in mid-air prior to successfully landing.

a) Outline how low self-efficacy traits may have impacted Danielle during her injury period. /2

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b) With appropriate examples, outline how performance accomplishments may have contributed to Danielle's eventual Olympic silver medal success. /2

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**Question 12 continues**

Marker use

c) What is the example of a tangible extrinsic reward for Danielle in the stimulus?

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/1

d) What is an example of an external stressor Danielle experienced?

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/1

e) Identify and outline **two (2)** pre-competition strategies Danielle could have implemented prior to arriving at the Olympics venue.

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/2

f) Identify and explain the **two (2)** most important attentional styles for a freestyle skier.

/2

| Attentional style | Explanation |
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*Table 4*

**Total Q12**

/10

**Question 13**

Marker use

This question assesses **Criterion 4**.

The Tasmania Devils competed in the Victorian Football League (VFL) and VFLW in 2026. The club recruited players from across Australia for both the men's and women's programs. As a result, both teams had limited experience playing together and needed to develop cohesion, communication and consistent performance under pressure.

a) Describe the concept of flow state. /1

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b) Define state anxiety. /1

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c) After a bad loss, the VFL coach may use negative motivation as a way to improve performance. Describe the concept of negative motivation and provide an example of how it might be implemented. /2

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d) Outline how attentional errors may occur under pressure in a new team environment. /2

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**Question 13 continues**

Marker use

e) Identify and describe the **three (3)** innate needs associated with self-determination theory.

/3

| Need | Description |
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*Table 5*

f) Identify and explain **three (3)** debriefing guidelines the Tasmania Devils would implement after a game has finished.

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**Total Q13**

/12

**Question 14**

Marker use

This question assesses **Criterion 4**.

Matt Jones is regarded as one of the world's best mountain bike riders. Every time he competes he needs elite concentration and focus.



*Figure 12*

a) Outline how Matt would use his senses during a visualisation prior to the race. /3

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b) Identify and outline mental rehearsal techniques Matt could use immediately after a race. /2

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**Question 14 continues**

Marker use

c) Outline how **two (2)** different outcome goals could be applied in mountain biking. /2

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d) Matt may have had feelings of amotivation during times of injury. Define amotivation. /1

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e) Outline **two (2)** reasons why Matt may use positive self-talk during a performance. /2

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f) Explain the concept of the staircase/stepping stone model of goal setting. /3

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**Total Q14** /13

**Total C4** /35

**Question 15**

Marker use

This question assesses **Criterion 5**.

The graph in Figure 13 represents three (3) different athletes: a tennis player, weightlifter and darts player. Each athlete is at a different performance level.

Arousal levels were a self-reported rating from 0 to 10.

Performance level scores were based on the athlete's performance compared to other athletes for that sport.

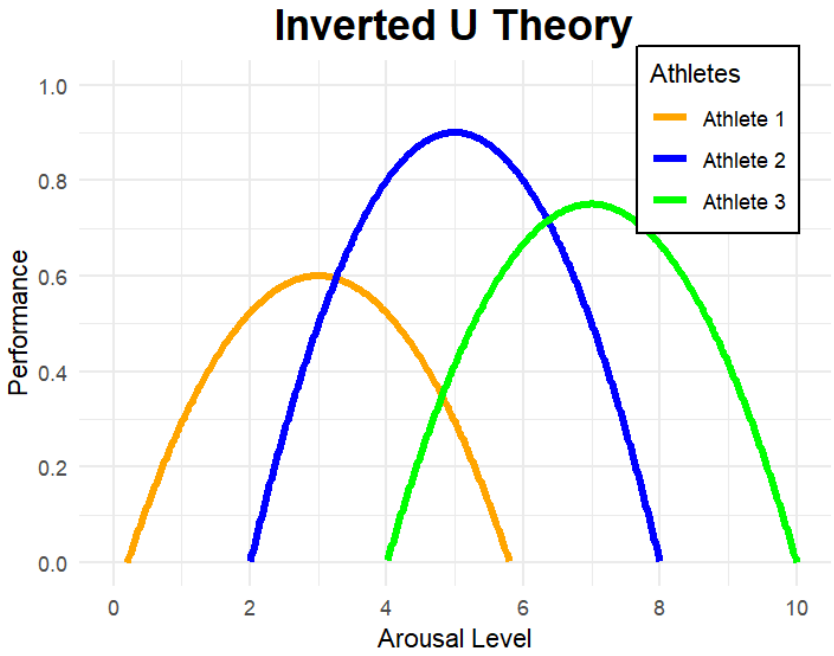



*Figure 13: Inverted U Theory for three different athletes.*

a) Identify the peak arousal level for Athlete 2 and Athlete 3 and the corresponding performance level.

/2

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**Question 15 continues**

Marker use

b) For each curve on Figure 13, identify and justify with data and theory which one represents the tennis player, weightlifter and darts player. /3

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c) From Figure 13, describe the change in performance for Athlete 1 between arousal levels 2 and 5. /2

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A sport coach suggests increasing arousal levels with loud music and a pep talk for both Athlete 1 and Athlete 2 when their arousal levels are at a 4.

d) Using Figure 13, evaluate whether this strategy would be effective for both athletes. Refer to specific arousal levels and performance trends in your answer. /3

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**Total Q15/C5** /10

# Acknowledgements

**Sources:**

**Figure 11**

The Daily Telegraph. (n.d.). *Aerial skier Danielle Scott ready to turn heads at the Winter Olympics* [Photograph]. *The Daily Telegraph*. https://www.dailytelegraph.com.au/sport/womens-sport/aerial-skier-danielle-scott-ready-to-turn-heads-at-the-winter-olympics/news-story/a9fca4ac23c717aa2790ca8e38d7de5a

**Figure 12**

Mountain Biking UK. (n.d.). *A day in the life of slopestyle pro Matt Jones* [Photograph]. *MBUK*. https://www.mbuk.com/articles/a-day-in-the-life-of-slopestyle-pro-matt-jones

End of Section C

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