Candidate Instructions

1. You **MUST** make sure that your responses to the questions in this examination paper will show your achievement in the criteria being assessed.

2. Answer **ALL** questions.

3. Answers must be written in the spaces provided on the examination paper.

4. You should make sure you answer all parts within each question so that the criterion can be assessed.

5. This examination is 3 hours in length. It is recommended that you spend approximately 60 minutes in total answering the questions in this booklet.

6. All written responses must be in English.

On the basis of your performance in this examination, the examiners will provide results on each of the following criteria taken from the course statement:

**Criterion 1** Describe and analyse physiological aspects of exercise.

**Criterion 2** Analyse and explain physiological responses to training.

**Criterion 5** Analyse and interpret sport science data and information.
Question 1

This question assesses **Criterion 1**.

Elite athletes who stress their bodies each day, must consider accessing and replenishing energy stores when training and competing.

a) Define energy. (1 mark)

b) Where is ATP stored in the body, and for how many seconds will it provide energy? (1 mark)

c) Discuss the process of ATP splitting. (3 marks)

d) Identify the THREE fuels athletes consume to help reform ATP. Rank these fuels according to the amount of energy they contribute to an athlete competing in an endurance event. (2 marks)
Question 2

This question assesses **Criterion 1**.

Madison de Rozario is a world class wheelchair endurance athlete who has competed successfully in the Commonwealth Games and the London Marathon this year.

a) What is stroke volume and how would prolonged endurance training have increased Madison de Rozario’s stroke volume? (2 marks)

b) Most of a marathon is completed at sub-maximal pace. Which energy system provides most of the energy for Madison in a marathon, and what are **TWO** by-products produced by this system? (2 marks)

c) If Madison has to respond to an increased race pace or has to race uphill, she may experience Oxygen Deficit. Explain this process and name the specific energy systems which Madison will also use to cope with this increased intensity. (3 marks)

d) What is aerobic steady state and how would Madison’s large stroke volume enable her ability to reach aerobic steady state early in a race? (2 marks)
Question 3

This question assesses **Criterion 1**.

When athletes exercise aerobically they can expect a number of acute responses and chronic adaptations.

a) Considering heart rate, what would be an acute response while exercising, and a chronic adaptation after a number of weeks of exercising? (1 mark)

b) One chronic adaptation to endurance exercise is an increase in the maximal amount of oxygen an athlete can consume, or their VO\textsubscript{2} Max. Explain how increased capillary density in muscles assists this adaptation. (2 marks)

c) Compare and evaluate two endurance athletes’ relative and absolute VO\textsubscript{2} Max capacities by using the following information. (4 marks)

<table>
<thead>
<tr>
<th>Athlete 1</th>
<th>VO\textsubscript{2} Max. = 5.6 Litres/minute</th>
<th>Weight = 80 kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athlete 2</td>
<td>VO\textsubscript{2} Max. = 4.8 Litres/minute</td>
<td>Weight = 60 kg</td>
</tr>
</tbody>
</table>

d) What is Lactate Inflection Point (LIP) and how does its improvement influence aerobic performance? (2 marks)
Question 3 (continued)

e) What are TWO types of training an athlete could use to achieve the following chronic adaptations?  
- Increased diameter of fast twitch muscle fibres  
- Increased stores of creatine phosphate.  

Question 4

This question assesses Criterion 2.

Training sessions should be structured to improve the physiological fitness components that an athlete needs for competition and need to be part of a long term plan that considers major competitions, recovery and return to training from injury and illness.

a) What would usually be the first phase in a training session, and what is it designed to do?  

b) Describe the principle of specificity, and explain how it would guide the conditioning/skill development phase of a training session to improve running speed.  

c) Consider a major sporting event. Outline TWO changes that would occur in a training session during a tapering period?  

d) What is the purpose of a cool down, and what are TWO activities a cool down could include?  

Question 5

This question assesses **Criterion 2.**

A midfield player in a team sport requires a range of fitness components to meet the demands of their position. These could include speed, agility, aerobic capacity and muscular power.

a) In order to improve muscular power, the midfield player could use resistance training. What is meant by 1 Repetition Maximum and by 10 Repetitions Maximum? (2 marks)

b) Explain the training principle of progressive overload, and provide **TWO** examples of how these could be used in a resistance training program. (2 marks)

c) The preparatory or pre-season period of training will be essential to the midfielder’s physiological preparation. Discuss the differences between general preparatory sub-phase and the specific preparatory sub-phase, and include how long each sub-phase should last. (3 marks)

d) Identify **TWO** advantages of cross training which may assist the midfield player. (1 mark)
Question 6

This question assesses **Criterion 2**.

Any athlete who is training appropriately will need to recover between each training session to ensure training quality is maintained.

a) With reference to oxygen consumption, lactic acid and creatine phosphate, explain how Excess Post-Exercise Oxygen Consumption (EPOC) contributes to an athlete’s recovery? (3 marks)

b) What sort of recovery should an athlete use to enhance lactic acid removal, and what will happen to the majority of the lactic acid that is removed? (2 marks)

c) Explain the terms training intensity and Delayed Onset Muscle Soreness (DOMS), and discuss their relationship. (2 marks)

d) An athlete struggling to recover fully after training sessions decides to seek advice from a nutritionist. Outline **THREE** strategies the nutritionist would recommend. (3 marks)
Question 7

This question assesses **Criterion 5**.

All answers to this question must make reference to the information that follows.

VO$_2$ Max is often used as a measure of aerobic capacity. As with many physiological measures, VO$_2$ max will change through life and in response to lifestyle.

**Graph 1**: Changes in VO$_2$ Max with increasing age from 6 to 18 years of age in boys and girls.


a) What is the VO$_2$ Max relative to body weight for 15 year old girls and for 15 year old boys? (1 mark)

b) Compare the increase in VO$_2$ Max (L/min) between the ages of 13 to 18 years for boys and girls. Refer to data in your answer. (3 marks)

c) What is the reason for your observation in (b)? (1 mark)

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Question 7 continues.
d) For each of the active adults and sedentary adults groups in Graph 2, identify in which 20 year period they experience their greatest decline in VO$_2$ Max. How much is each decline? (2 marks)

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e) If sedentary adults began exercising, what would be their expected VO$_2$ Max at age 50 years? (1 mark)

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f) At what age does the expected benefit to sedentary adults of exercise intervention begin to reduce? (1 mark)

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g) What is the difference in VO$_2$ at age 80 years between active adults and sedentary adults? (1 mark)

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Candidate Instructions

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2. Answer **ALL** questions.

3. Answers must be written in the spaces provided on the examination paper.

4. You should make sure you answer all parts within each question so that the criterion can be assessed.

5. This examination is 3 hours in length. It is recommended that you spend approximately 45 minutes in total answering the questions in this booklet.

6. All written responses must be in **English**.

On the basis of your performance in this examination, the examiners will provide results on each of the following criteria taken from the course statement:

**Criterion 3**  Analyse and discuss principles of skill acquisition in sport.

**Criterion 5**  Analyse and interpret sport science data and information.
Question 8
This question assesses **Criterion 3**.

When learning a new physical skill there is a risk that it can be learnt incorrectly. Good demonstration, instruction, practice and feedback can assist the learner to have the best chance to develop well organised and efficient skills.

a) What are **FOUR** characteristics of someone in the cognitive stage of learning? (2 marks)

b) Select a skill and place **FOUR** of its sub-routines in the correct sequence. How is this skill classified? (3 marks)

c) If you are coaching someone to learn the skill identified in b), present **THREE** key, specific teaching points that you could make to reinforce skill learning for the learner. (3 marks)

d) Describe massed practice and identify why this form of practice may **NOT** be preferable for someone learning a skill. (2 marks)

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Question 9
This question assesses **Criterion 3**.

At half time in a soccer match it rains heavily. The ground, which was dry in the first half, is now slippery for players attempting to change direction. Also, the ball now reacts differently when passed along the ground and when bouncing.

a) Define schema and, using a specific example, describe how it could influence response selection in the scenario above.  
(2 marks)

b) Outline what is meant by selective attention, and discuss how its use early in the second half of the soccer match can assist a player to adapt to the changing conditions. Use a specific example to support your answer.  
(3 marks)

c) Effective fakes and baulks can work well in team sports. Name and describe the process a fake or baulk may initiate in an opponent.  
(2 marks)

**Question 9 continues.**
d) Discuss how temporal anticipation may assist a goalkeeper's response time now that their movements may need to be a little slower in the conditions. (2 marks)

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e) Differentiate between feedback that is knowledge of performance (KP) and that which is knowledge of results (KR). Provide an example of which type of feedback would be most beneficial to a player struggling in these conditions. (3 marks)

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Question 10

This question assesses **Criterion 3**.

Many movements executed in a sport have elements in common with movements in other sports. For example, a good overarm throwing technique in cricket is very similar to the technique required to throw a javelin. The subroutines and their sequence and timing, in each, are similar.

a) Describing movements accurately is an important element of skill analysis. What do the following words mean? (2 marks)

- Flexion
- Adduction
- Extension
- Anterior

b) Identify a sporting skill in which:

- flexion occurs at the wrist (1 mark)
- extension occurs at the hip

b) If an elite netball goal shooter decides to play basketball, what are **THREE** ways she can ensure stability before shooting which she can transfer to her new sport? (3 marks)

- ...
- ...
- ...
- ...
- ...
- ...

Question 10 continues
Question 10 (continued)

d) Outline the characteristics of autonomous skill performance, and describe how long term memory assists an elite performer in the execution of their skills in competition. (3 marks)

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e) Good coaching often requires naked eye analysis and immediate and concise feedback to players who are struggling to work out why they are making skill errors. Classify this type of feedback. (1 mark)

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f) The image below illustrates an example of projectile motion in which a person jumps from one structure to another.

Explain how the angle of take-off and velocity of take-off influence the person’s ability to jump successfully from one structure to the other. (3 marks)

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Question 11
This question assesses **Criterion 5**.

**All answers to this question must make reference to the information that follows.**

The following tables include information collected on the response of three balls of different size and mass which became projectiles when a force was applied to them. Each ball had the same force applied to them and was propelled from the same height. The trials were conducted indoors.

**Table 1: Ball characteristics, trial results and mean scores.**

<table>
<thead>
<tr>
<th>Ball Type</th>
<th>Ball Mass (kg)</th>
<th>Time in Air (seconds) 5 Trials</th>
<th>Distance Travelled (metres) 5 Trials</th>
<th>Average Time in Air (seconds)</th>
<th>Average Distance Travelled (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golf Ball</td>
<td>0.0459</td>
<td>0.75 0.78 0.75 0.71</td>
<td>4.14 4.24 4.14 3.83 3.96</td>
<td>0.74</td>
<td>4.06</td>
</tr>
<tr>
<td>Tennis Ball</td>
<td>0.0578</td>
<td>0.70 0.72 0.78 0.69 0.71</td>
<td>3.47 3.53 4.32 3.51 3.50</td>
<td>0.71</td>
<td>3.66</td>
</tr>
<tr>
<td>Baseball</td>
<td>0.1462</td>
<td>0.63 0.65 0.61 0.66 0.69</td>
<td>3.00 3.01 2.99 3.04 3.02</td>
<td>0.65</td>
<td>3.01</td>
</tr>
</tbody>
</table>

Source: [https://sites.google.com/site/catapultprojectile/results/data-tables](https://sites.google.com/site/catapultprojectile/results/data-tables)

a) Identify the ball that travelled the furthest during the trials and how far it travelled. (1 mark)

b) For the golf ball and the tennis ball, identify the range for time in air during the five trials? (2 marks)

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**Question 11 continues**

**Question 11 (continued)**
c) With reference to **TWO** pieces of data, briefly describe the relationship between ball mass and average distance travelled. (3 marks)

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d) Some trials for each ball produced some significantly different results to the majority. What factor influencing the balls’ release may not have been as controlled as others? (1 mark)

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Table 2: Acceleration and velocity data.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Golf Ball</th>
<th>Tennis Ball</th>
<th>Baseball</th>
</tr>
</thead>
<tbody>
<tr>
<td>Velocity (m/s)</td>
<td>5.46</td>
<td>5.15</td>
<td>4.63</td>
</tr>
<tr>
<td>Acceleration (m/s/s)</td>
<td>7.37</td>
<td>7.25</td>
<td>7.12</td>
</tr>
</tbody>
</table>

e) In Table 2, which ball experienced the greatest acceleration? Refer to data in your answer. (1 mark)

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f) For the balls in Table 2, rank the velocity from fastest to slowest. What is responsible for the difference in the balls’ velocity? (2 marks)

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6. All written responses must be in English.

On the basis of your performance in this examination, the examiners will provide results on each of the following criteria taken from the course statement:

**Criterion 4** Examine and discuss how sport psychology influences athletic performance.

**Criterion 5** Analyse and interpret sport science data and information.
This question assesses **Criterion 4.**

Champion tennis player, Arthur Ashe, offered the following advice;

“One important key to success is self confidence. An important key to self confidence is preparation.”

a) Define self confidence. How does self-efficacy in sport differ from self-confidence? (2 marks)

b) What are **TWO** possible implications for an athlete lacking self confidence? (1 mark)

c) For a sport of your choice, provide a specific example of a vicarious experience that may enhance an athlete’s self-efficacy. (1 mark)

d) The comments from Arthur Ashe highlight the importance of preparation to an athlete’s self confidence. Outline **THREE** pre-competition strategies an athlete could use prior to arriving at the competition venue. (3 marks)

e) Define coping strategies, and provide a practical example of a coping strategy from a team sport of your choice. (2 marks)
f) Following competition, planning for the next competitive event will begin almost immediately. What aspect of debriefing could help enhance an athlete’s self-efficacy? (1 mark)

Question 13

This question assesses **Criterion 4**.
One of the challenges for coaches of teams is to bring together a diverse range of people to play as one unit. Their greatest difference will often be in their psychology.

a) A soccer team loses the first five matches of its season. Discuss how an intrinsically motivated player and an extrinsically motivated player may have a different perspective of this situation. (2 marks)

b) Define flow and briefly describe how an intrinsically motivated athlete may achieve a state of flow. (2 marks)

c) Describe how achieving process goals can enhance a player’s intrinsic motivation. Provide an example of a process goal from a sport of your choice. (3 marks)

Question 13 continues.

Question 13 (continued)

d) Goal setting is often based around the SMARTER principle. How does this principle assist a young and improving athlete with their goal to gain selection for the world junior championships,
in a sport of your choice, in two years’ time? Refer to each letter of the acronym in your answer. (4 marks)

Sport of your choice ………………………………………………………

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e) Why should short term and long term goals be linked? (1 mark)

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Question 14

This question assesses Criterion 4.

The Catastrophe Theory aims to represent the relationship between arousal and performance. Although similar to other theories it includes a third variable, anxiety.
a) What is cognitive anxiety? Provide a sporting example that may contribute to an athlete’s cognitive anxiety. (2 marks)

b) An athlete may demonstrate behaviour to coaches and other athletes which may indicate they are anxious. List FOUR of these behaviours. (2 marks)

c) Explain TWO benefits of visualisation which may assist an over anxious athlete to reduce their anxiety to manageable levels. (2 marks)

d) In a team, some athletes may have a pre-disposition to be under-aroused. Describe how their trait anxiety may contribute to this arousal level. (1 mark)

Question 14 continues.

Question 14 (continued)

e) A coach is struggling to raise the arousal level of a number of athletes to optimal levels. Identify TWO methods he could use. (1 mark)
f) Robert Nideffer suggests that when over-aroused our attentional capabilities may suffer. Identify **ONE** of the attentional errors he indicates may occur and, a specific sporting example of the error. (2 marks)


g) Describe the difference between attention and concentration. Which of the following (A or B) is an example of attention. Support your selection with a reason. (3 marks)

A: An AFL player focuses on their kicking technique when in goal kicking range.
B: An AFL player looks for players in a better position before deciding to kick at goal.

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**Question 15**

This question assesses **Criterion 5**.

All answers to this question must make reference to the information that follows.

A sport psychologist is recruited by a soccer club to try and convince players of the benefits of mental rehearsal.
The players are split into two groups of 10. Each group completes a drill, culminating in a shot at a target. Each trial is scored out of 10. The higher the score, the faster and more accurate the performance.

**Group A** repeats this drill once in each of the next two weeks. **Group B** is trained in some mental rehearsal methods, uses these methods and repeats the drill once in each of the next two weeks.

<table>
<thead>
<tr>
<th>Table 1 – Trial results for Group A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Player</td>
</tr>
<tr>
<td>Trial 1</td>
</tr>
<tr>
<td>Trial 2</td>
</tr>
<tr>
<td>Trial 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2 – Trial results for Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Player</td>
</tr>
<tr>
<td>Trial 1</td>
</tr>
<tr>
<td>Trial 2</td>
</tr>
<tr>
<td>Trial 3</td>
</tr>
</tbody>
</table>

a) Which player in Group A benefitted the most from repeating the task? Refer to data in your answer.  
(2 marks)

b) Which player in Group B appears not to have benefitted from using mental rehearsal? Refer to data in your answer.  
(2 marks)

c) A score of 7 or more is considered a good score. Identify the number of players achieving a score of 7 or more in Trial 1 and/or Trial 3 for Group A and Group B. Refer to data in your answer and comment on the results you have identified.  
(4 marks)

**Question 15 continues**
d) Refer to the mean scores for each group in presenting a statement about the effectiveness, or not, of using mental rehearsal. (2 marks)
Candidate Instructions

1. You **MUST** make sure that your responses to the questions in this examination paper will show your achievement in the criteria being assessed.

2. This paper has **THREE** questions.

3. You must answer **TWO** questions in extended response form.

4. Answers must be written in the spaces provided on the examination paper.

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6. This examination is 3 hours in length. It is recommended that you spend approximately 45 minutes in total answering the questions in this booklet.

7. All written responses must be in English.

On the basis of your performance in this examination, the examiners will provide results on each of the following criteria taken from the course statement:

**Criterion 6**
Examine and discuss cross-discipline links.
These questions assess **Criterion 6.**

Answer **TWO** questions in this section.
Question 16

Former Hawthorn AFL player, Luke Hodge, is now playing for the Brisbane Lions. Although not as fast as he once was, he is highly skilled, has a good understanding of strategy and is a very calm player.

Use TWO cross discipline links to demonstrate how Luke Hodge’s high level of skill (Skill Acquisition), his experience and personality (Sport Psychology) will work together to make him a valuable player for Brisbane. (15 marks)

Question 17

At the Gold Coast Commonwealth Games, the Australian netball team was beaten by one point in the Gold Medal match by England, despite being a strong favourite. Australia’s players played tentatively and, at times, looked very slow. England, on the other hand, played confidently and moved quickly around the court.

Use TWO cross discipline links to demonstrate how England’s strong physical condition (Exercise Physiology) positively influenced their mindset throughout the match (Sport Psychology). (15 marks)

Question 18

In game five of the Eastern Conference Basketball Final in the NBA, Boston defeated Cleveland to take a 3 – 2 lead in the best of seven series. Star Cleveland player LeBron James had a poor game. Two days later, James dominated game six with 46 points to lead Cleveland to a win.

Use TWO cross discipline links to demonstrate how James’s physical condition (Exercise Physiology) enabled him to improve his performance (Skill Acquisition) in game six. (15 marks)

Question Number:  
(In the box write the number of the question you are answering)
This question paper and any materials associated with this examination (including answer booklets, cover sheets, rough note paper, or information sheets) remain the property of the Office of Tasmanian Assessment, Standards and Certification.