PHYSICAL EDUCATION STUDIES

Student number: In figures

In words

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: non-programmable calculators approved for use in this 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

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<td>100</td>
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Instructions to candidates

1. The rules for the conduct of the Western Australian external examinations are detailed in the *Year 12 Information Handbook 2018*. Sitting this examination implies that you agree to abide by these rules.

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

3. 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.

   Sections 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.

4. 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.

5. 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.
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. The connective tissue surrounding the entire skeletal muscle is known as

   (a) epimysium.
   (b) perimysium.
   (c) fascicle.
   (d) myofibril.

2. John is an 8-year-old boy who has begun swimming lessons. Which type of feedback should his teacher avoid using?

   (a) extrinsic
   (b) knowledge of results
   (c) negative
   (d) positive

3. The benefits for athletes who train at altitude will occur after

   (a) 2–3 weeks of training at altitude and will last up to 6 months at sea level.
   (b) 2–3 weeks of training at altitude and will last up to 2 months at sea level.
   (c) 5–14 days of training at altitude and will last up to 6 months at sea level.
   (d) 5–14 days of training at altitude and will last up to 2 months at sea level.

4. Recovery for athletes is vital in optimising their performance. One method of aiding recovery is the use of nutritional strategies. What are the main benefits of this method?

   (a) replenish muscle glycogen, replace lost fluids and electrolytes and prevent delayed onset muscular soreness
   (b) replace lost fluids and electrolytes and manufacture new muscle and red blood cells
   (c) replace lost fluids and electrolytes and prevent delayed onset muscular soreness
   (d) replenish muscle glycogen, replace lost fluids and electrolytes and assist in repairing muscle tissue
5. Which statement is best related to low GI foods?

(a) They are digested rapidly and quickly release glucose to the muscles.
(b) Athletes are advised to eat them 1–4 hours before a competition.
(c) They are more beneficial for power athletes than endurance athletes.
(d) Athletes are advised to eat them during competition.

6. A father teaches his son to ride a bike using a ‘balance bike’ (a bike without pedals as seen in Image 1). Once he is confident in balancing on two wheels while moving, the father puts his son on a normal bike to learn to use the pedals as seen in Image 2.

What coaching activity is the father using in this situation?

(a) simple to complex
(b) static to dynamic
(c) shaping
(d) chaining

7. During a game, Perth Heat baseball pitcher Alex Boshers throws the following four pitches, putting a different spin on each throw and creating a different flight path for each pitch.

<table>
<thead>
<tr>
<th>Pitch</th>
<th>Flight path</th>
<th>Spin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>fast and straight with no deviation in line</td>
<td>?</td>
</tr>
<tr>
<td>2</td>
<td>slow and dips quickly</td>
<td>?</td>
</tr>
<tr>
<td>3</td>
<td>slow and breaks sharply to the left</td>
<td>?</td>
</tr>
<tr>
<td>4</td>
<td>slow and wobbles unpredictably</td>
<td>?</td>
</tr>
</tbody>
</table>

Which is the correct order for the spin put on each pitch delivered?

(a) back spin top spin side spin no spin
(b) side spin no spin back spin top spin
(c) top spin no spin side spin back spin
(d) no spin back spin top spin side spin
8. An athlete wanting to transfer from snowboarding to skateboarding changes coaches to prepare. What is the correct order of steps the coach would take to analyse the movement of the athlete to improve their technique?

(a) Evaluate → Prepare → Observe → Feedback  
(b) Observe → Prepare → Evaluate → Feedback  
(c) Prepare → Observe → Evaluate → Feedback  
(d) Prepare → Observe → Feedback → Evaluate

9. Pictured below is Australian rower, Kim Crow. She is applying the principle of leverage to move her boat through the water. The blade of her oar in the water acts as the fulcrum.

What is the correct statement about the lever system she is employing?

Kim is using a:

(a) 1st Class lever whereby the load is on the same side of the fulcrum as the effort.  
(b) 1st Class lever whereby the load is on the opposite side of the fulcrum to the effort.  
(c) 2nd Class lever whereby the load is on the opposite side of the fulcrum to the effort.  
(d) 2nd Class lever whereby the load is on the same side of the fulcrum as the effort.
10. In the World’s Strongest Man competition, the ‘Atlas Stones’ event requires competitors to lift stones weighing from 100 kg to 160 kg onto five platforms.

Competitors generate more force when the stones are lifted

(a) quickly because it allows the recruitment of more Type IIa muscle fibres.
(b) quickly because more sarcomeres can contract simultaneously.
(c) slowly because it allows the recruitment of more Type I muscle fibres.
(d) slowly because more motor units can contract simultaneously.

11. At the beginning of each season of the Indian Premier League Twenty20 cricket competition, players are recruited by each team via a player auction. The rules of the competition state that teams can only retain a maximum of three players from the previous season. As a result, teams experience a large turnover of players each year.

According to Carron’s Model of Group Cohesion, this is an example of ____________ and may have a ________________ impact on group cohesion.

(a) a personal factor, positive
(b) an environmental factor, negative
(c) a leadership factor, negative
(d) a team factor, positive

12. Identify the muscle fibre type that best matches the characteristics and relative proportion outlined below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Relative proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of mitochondria</td>
<td>Moderate</td>
</tr>
<tr>
<td>Motor neuron size</td>
<td>Large</td>
</tr>
<tr>
<td>Resistance to fatigue</td>
<td>Moderate</td>
</tr>
<tr>
<td>Capillary density</td>
<td>Low</td>
</tr>
</tbody>
</table>

(a) Type Ia  
(b) Type Ib  
(c) Type IIa  
(d) Type IIb
13. With regard to the athlete's predominant energy system, the best recovery strategy for a high jumper to use while waiting for the next jump height to be set is
(a) to rest.
(b) a light walk.
(c) to stretch.
(d) to eat food.

14. When cold, an athlete will utilise a higher amount of energy to maintain their core body temperature. As a result
(a) carbohydrate sources are depleted, increasing aerobic endurance.
(b) glycogen stores are depleted, decreasing aerobic endurance.
(c) protein sources are depleted, decreasing aerobic endurance.
(d) fat sources are depleted, increasing aerobic endurance.

15. Before they enter the ice rink to complete their routine a skater takes a minute to breathe deeply a number of times. What type of mental skill strategy are they most likely using?
(a) goal-setting
(b) imagery
(c) self-talk
(d) relaxation

16. To ensure that an athlete performs at their optimal level, they will taper prior to a competition. This involves
(a) reducing training volume and increasing intensity during training.
(b) increasing training volume and reducing intensity during training.
(c) reducing training volume and reducing intensity during training.
(d) increasing training volume and increasing intensity during training.

17. Provided the same ball is used on each surface, which is the correct statement in relation to the image below?

(a) Clay courts have a lower coefficient of restitution than grass courts.
(b) On grass, a player has less time to hit the ball due to the high coefficient of restitution.
(c) Hard courts have a higher coefficient of restitution than grass courts.
(d) A player on grass has more time to hit the ball due to the high coefficient of restitution.

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18. A characteristic of a Type IIb muscle fibre compared to a Type I muscle fibre is that it
   (a) has greater stores of creatine phosphate (CP).
   (b) is a darker shade of red.
   (c) has a greater number of myoglobin.
   (d) does not fatigue as quickly.

19. The in-season phase of a training program should aim to
   (a) develop a base level of fitness.
   (b) correct any weaknesses in speed or strength.
   (c) decrease the intensity of training while the volume slowly increases.
   (d) increase the intensity of training while the volume slowly decreases.

20. Compared to a hot and dry day, a hot and humid day increases the risk of heat exhaustion for an athlete because
   (a) radiation from the body is increased.
   (b) evaporation of sweat is reduced.
   (c) convection is decreased.
   (d) conduction from the body is increased.

End of Section One
Section Two: Short answer  

This section has eight 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**  

(a) Name the structures that are labelled on the diagram above.  

A:  

B:  

C:  

D:  

E:  

(9 marks)
Question 21 (continued)

A basketball player needs to be able to control the amount of force her muscle contractions produce in different situations.

(b) Define the ‘all or none’ principle and describe how the basketball player is able to control the forcefulness of her skeletal muscle contractions to perform a fast, penetrating pass. (4 marks)
Question 22

The graphs below represent the distribution of blood around the body under four different conditions; exercising at room temperature, exercising in the heat, exercising in the cold and the body at rest.

(a) Identify the condition that each graph represents. (4 marks)

Graph A: ________________________________

Graph B: ________________________________

Graph C: ________________________________

Graph D: ________________________________
Question 22 (continued)

(b) Justify why you chose the graphs that represent 'exercising in the heat' and 'exercising in the cold'.

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(6 marks)
Max Duffy was drafted to play in the Australian Football League by the Fremantle Dockers in 2012. In his debut game with Fremantle, he kicked a goal from 52 metres with his first kick of the game. In December 2017, he was awarded a scholarship to the University of Kentucky to play as a punter in the University's gridiron team. The role of the punter is to kick the ball as high and as far as possible to maximise his teammates' ability to run into position. A punt of 45–50 metres is considered a good kick.

(a) Describe the category of transfer of learning that Max has experienced. (2 marks)

(b) Identify two other categories of transfer of learning and provide an example of what Max might experience for each category. (4 marks)
Alec Potts won a bronze medal at the Rio Olympic Games in the men’s archery team event. During this event, competitors aim to shoot their arrows at the centre of a 1.2 m target from a distance of 70 metres. Following a strong start in the Bronze Medal match, Alec and his teammates were able to hold their nerve against their fast-finishing Chinese opponents to win.

(a) Explain how the biomechanical principle of force-time is applied by the bowstring to project the arrow effectively to the target. (4 marks)

(b) Outline two mental skill strategies Alec could have used during the event and outline how each would have reduced the stress he may have experienced. (4 marks)
At the 2012 London Olympic Games, new starting blocks were introduced, as shown in the diagram above. By comparison with the blocks at the 1984 Olympics, the new blocks have a more steeply sloped surface and a raised lip at the rear.

(a) Justify the sloped design of the new starting blocks in relation to the biomechanical principle of balance.  (2 marks)

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(b) In relation to the biomechanical principle of force-motion, explain how the raised lip at the rear of the block improves the performance of the swimmer.  (3 marks)

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Jeannette is a beginner lacrosse player who needs to purchase a lacrosse stick. There is a choice of two sticks, ‘Il Mostro” and ‘Diabelek’, and the length and weight of each is given in the table below.

<table>
<thead>
<tr>
<th>Type of Stick</th>
<th>Length (cm)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Il Mostro</td>
<td>188</td>
<td>350</td>
</tr>
<tr>
<td>Diabelek</td>
<td>101</td>
<td>280</td>
</tr>
</tbody>
</table>

(a) Use the information provided to identify the **most** relevant biomechanical concept that Jeannette needs to understand to choose the best stick.  

(b) Apply your knowledge of the above biomechanical concept to justify which stick you would suggest Jeanette should select.  

(c) Social loafing can occur in a lacrosse team. What is social loafing? Provide **two** examples of how a coach can minimise it.
Cynthia is a marathon runner who is training for the Australian Marathon Championships to be held in Sydney. A colleague suggests that she should take anabolic steroids to improve her performance in the Marathon.

(a) Ignoring the legal ramifications of using anabolic steroids, justify if this advice is correct or not for a marathon runner. (3 marks)

(b) Identify three physiological side effects Cynthia could experience from using anabolic steroids. (3 marks)

(c) Other than anabolic steroids, name two other categories of performance enhancers. (2 marks)
Question 28  (10 marks)

Daniel and Ahmed have just finished competing at the State Swimming Championships and from their results have been selected in the Western Australian Team for the National Championships in 15 weeks’ time. Below is an outline of the first 12 weeks of the training program the two swimmers use leading up to the National Championships.

12 week swimming training program

(a) For which weeks has Ahmed’s coach applied the training principle of recovery? (1 mark)

(b) During week nine, one of the swimmers complains to the coach that his shoulder is sore. Which athlete is more likely to have injured his shoulder? (1 mark)

(c) In relation to the training program, identify and explain the potential cause of the injury. (3 marks)
(d) Identify **two** psychological symptoms the athlete may have experienced prior to the injury occurring? (2 marks)

________________________________________________________________________

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________________________________________________________________________

(e) With reference to periodisation, identify and explain the training strategy you would advise the coach to apply in weeks 13 and 14 of the training program to ensure that Daniel and Ahmed perform at their optimum level at the National Championships. (3 marks)

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End of Section Two
PHYSICAL EDUCATION STUDIES 20

Section Three: Extended answer 30% (30 Marks)

This section contains four questions. You must answer two 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: 50 minutes.

Question 29 (15 marks)

Professional cycling teams invest time and resources in reducing the amount of drag experienced by their riders from wind resistance. They do this by making adjustments to their cycling technique on the basis of research conducted in a wind tunnel as seen in the two images below:

(a) Identify the image with the more aerodynamic position and justify your response by discussing the following points:

- the type of drag being minimised
- the two different types of fluid flow seen in the images and how they affect drag.

(7 marks)

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See next page
(b) With reference to the sliding filament theory, describe how a muscle contraction occurs in the legs of a cyclist to create movement. Your answer must describe what happens from when the muscle receives the initial neural impulse to when it relaxes. (8 marks)

See next page
Cross-country skiers are among the fittest endurance athletes of any sport. At the 2018 Winter Olympic Games, athletes competed in the Mass Start Classic, raced over 30 km (female) and 50 km (male).

Cross-country skiers need to be sufficiently fuelled to perform at their optimal level. Discuss the nutritional strategies the athlete should employ before, during and after the race to ensure they perform at their best and assist in their recovery.
The World Under-24 Ultimate Frisbee Championships were held in Perth in January 2018. This tournament consisted of teams playing 10 games over a one-week period.

(a) A key element of the game is the frisbee flying smoothly through the air. In reference to the frisbee’s performance in the air, explain how Bernoulli’s principle assists in keeping the frisbee in the air longer and thus enhancing the distance it travels. Draw and label a diagram to assist your explanation. (5 marks)
Twelve months before the World Championships the Australian athletes had to play in the National Championships to earn selection. Once the teams were selected, the National coaches had to plan and design a 12 month training program for the players to peak at the World Championships with the ability to play 10 games over a week.

(b) Discuss the elements of periodisation the coaches would apply to the training program, starting from the end of the National Tournament and going through to the World Championships. (10 marks)
Western Australia’s State Volleyball teams made history in December 2017 when the Hornets (male team) and the Pearls (female team) appeared at the Australian Volleyball League (AVL) grand finals in Melbourne for the first time together.

(a) Discuss how environmental, leadership and personal factors in Carron’s model of group cohesion may have helped the Hornets and Pearls to have a successful 2017 season.

(9 marks)
(b) During a game of volleyball, players can serve by hitting the ball with topspin. On the diagram below, draw the trajectory of a ball served with topspin and write an explanation of how the flight path is affected by the spin of the ball. (6 marks)
Supplementary page

Question number: ____________

__________________________________________________________________________

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ACKNOWLEDGEMENTS

Question 6  
Image 1  

Image 2  

Question 9  

Question 10  

Question 17  

Question 21  

Question 24  

Question 29  

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