



St Stephen's School

SERVE GOD SERVE ONE ANOTHER

PHYSICAL EDUCATION STUDIES ATAR

YEAR 12 – UNIT 3&4

SEMESTER 2, 2020

Student number: In figures

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Student Number: 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.

Structure of this paper

Section	Number of questions available	Number of questions to be answered	Suggested working time (minutes)	Marks available	Percentage of exam
SECTION ONE: Multiple-choice	20	20	25	20	20
SECTION TWO: Short answer	8	8	75	70	50
SECTION THREE: Extended answer	4	2	50	30	30
					100

Instructions to candidates

1. The rules for the conduct of examinations are detailed in the *St Stephen's School Parent Handbook* and in *SEQTA* under documents. 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 the 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 and Three: Write answers in this Question/Answer Booklet with a blue or black pen ONLY.

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 the 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. 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: 25 minutes.

1. Fast twitch muscle fibres are more suited to explosive activities because they have a:
 - (a) high oxidative capacity, high resistance to fatigue, high force capacity
 - (b) high glycolytic capacity, high force capacity, high speed of contraction
 - (c) high oxidative capacity, high force capacity, high speed of contraction
 - (d) low glycolytic capacity, high force capacity, high speed of contraction

2. A technique involving systematic tensing and relaxing of major muscle groups is commonly known as:
 - (a) progressive muscle relaxation
 - (b) meditation
 - (c) yoga
 - (d) progressive tension control

3. A lever designed to reduce the amount of force required to move a heavy object would be a:
 - (a) first class lever, where the force arm is longer than the resistance arm
 - (b) second class lever, where the force arm is longer than the resistance arm
 - (c) third class lever, where the force arm is longer than the resistance arm
 - (d) both (a) and (b)

4. The angular momentum of a diver performing a reverse two and a half somersault with two and a half twists will be:
- (a) highest during the twist phase
 - (b) lowest during the twist phase
 - (c) highest during the somersault phase
 - (d) constant throughout the movement
5. Establishing group goals, roles and norms are important for developing:
- (a) team dynamics
 - (b) team confidence
 - (c) team cohesion
 - (d) team hierarchy
6. Without additional nutritional intervention, low intensity, continuous exercise lasting 3-4 hours will require the majority of the ATP to be resynthesised by breaking down:
- (a) carbohydrates
 - (b) creatine phosphate
 - (c) fats
 - (d) proteins
7. Mental imagery can lead to performance improvements by:
- (a) improving neural pathways between the brain and the muscles
 - (b) ensuring over arousal never occurs
 - (c) improving muscle memory
 - (d) providing visual cues to the athlete

8. A sprint coach is analysing her athlete's start technique. After establishing the key features of the skill, the next stage in the qualitative analysis process is:
- (a) identifying the strengths and weaknesses of the athlete's performance
 - (b) establishing some process goals for the athlete to follow
 - (c) determining the appropriate angle to observe the athlete
 - (d) providing some feedback on the areas to improve
9. Connective tissue sheaths support each cell and reinforce the muscle as a whole. Which answer reflects the appropriate order of connective tissue organisation from most external, to most internal?
- (a) endomysium, perimysium
 - (b) epimysium, perimysium
 - (c) perimysium, epimysium
 - (d) endomysium, epimysium
10. Which is correct when considering leadership styles?
- (a) the athlete's skill level can determine the style adopted
 - (b) male athletes always respond to a dictatorial approach
 - (c) a casual leadership style should be the dominant approach in junior sport
 - (d) leadership styles should not change as this can be confusing for the athlete
11. Which of the following is an appropriate sporting example of the biomechanical principle of inertia?
- (a) Increase muscle mass through strength training in order to increase the body's ability to rapidly accelerate.
 - (b) Train with a weighted vest on during a sprint session so that smaller forces are required to overcome the inertia of the body.
 - (c) Increase the length of a baseball bat to make it easier to swing.
 - (d) Use racing flats/spikes in competition as the smaller mass of the shoes makes the athlete's feet feel light and quick.

Questions 12 and 13 refer to the information below:

Ski Jumping involves competitors taking advantage of lift forces in order to travel the greatest possible distance. The images below show how ski jumping has evolved over the years.



A-Ski Jumper in the early
1900's

B-Ski Jumper in 2005

12. Which statement is correct in regard to the impact of fluid mechanics on the ski jumpers?
- (a) A high-pressure zone underneath the skier is generated through higher fluid velocity.
 - (b) The fluid flowing over the top of the skier is accelerated, creating an area of low pressure.**
 - (c) The fluid flowing over the top of the skier is accelerated, creating an area of high pressure.
 - (d) The high-pressure zone above the skier increases flight time.
13. When comparing the technique of the two ski jumpers, which statement is correct?
- (a) Ski jumper B will travel a further distance as they have a more appropriate angle of attack and airfoil shape to optimise lift and minimise drag.**
 - (b) Ski jumper A has a decreased cross-sectional area by standing in an upright, narrow position.
 - (c) Ski jumper B ensures they have no angle of attack as this would otherwise decrease lift.
 - (d) Ski jumper A experiences the greatest amount of lift due to the narrow ski position, but the most drag due to the loose clothing.

14. A tennis player could increase the linear velocity of the tennis ball by:
- (a) increasing the length of their racket
 - (b) increasing the racket's velocity through improved segmental interaction of the body's segments
 - (c) reducing the racket's radius of rotation by sliding their hands closer to the proximal end of the racket
 - (d) both (a) and (b)
15. Humans are usually 25–30% stronger when lowering, than when lifting a weight, in the same exercise. This is because
- (a) less crossbridges are attached during eccentric movements.
 - (b) the force a muscle can resist in an eccentric contraction is less than the force a muscle can create concentrically.
 - (c) muscle fibres use both active and passive elements to produce force while they are lengthening, but they can only use active elements to produce force while they are shortening.
 - (d) the sarcomere has optimal overlap during an eccentric contraction.
16. The examples below outline the focus a coach jotted down when preparing his volleyball training session to develop the hit/spike. Which training activity has the coach employed?
- Use a ball toss to ensure a more predictable trajectory
 - Only incorporate one type of hit (cross court only) to reduce attentional demands
 - Remove defensive blockers to eliminate external pressure
- (a) static to dynamic
 - (b) chaining
 - (c) practise to competition
 - (d) simple to complex

17. An increased body temperature will contribute to fatigue by:
- (a) reducing oxygen availability to the cardiac muscle
 - (b) reducing blood pressure and increasing plasma levels
 - (c) increasing blood flow to the skin's surface
 - (d) increasing blood flow to the muscles and vital organs
18. A ball that is hit furthest from its centre of gravity will travel with the greatest amount of:
- (a) linear velocity
 - (b) torque
 - (c) spin
 - (d) angular momentum
19. Negative transfer of learning most likely occurs when
- (a) a hockey player strikes a golf ball but is not used to the smaller size the ball.
 - (b) a tennis player batting in softball has to use a longer and heavier bat than the tennis racket they are used to.
 - (c) the skills have a similar action but there are critical differences in technique.
 - (d) all of the above.
20. Which statement is true in relation to the coordination continuum?
- (a) A skill cannot exhibit characteristics of both simultaneous and sequential movements.
 - (b) Sequential movements favour generating maximal strength.
 - (c) More simultaneous movements are effective for skills requiring accuracy.
 - (d) Sequential force summation is optimised when the number of segments used is reduced.

Section Two: Short answer**50% (70 marks)****Question 21****(10 marks)**

- (a) Identify and explain the structure shown in the two diagrams.

(2 marks)

Description	Marks
Identifies sarcomere	1 mark
Explains functional unit of muscle Shortens during muscle contraction Contains actin and myosin filaments	1 mark for any point

- (b) Identify the contractile proteins involved in the change of length from diagram A to B.

(1 mark)

Description	Marks
Identifies actin and myosin	1 mark for both

- (c) Explain the theory which outlines the process that causes the change in length from diagram A to B.

(5 marks)

Description	Marks
Once impulse reaches the muscle, calcium is released into sarcomere	1 mark
Causes binding sites on actin to open	1 mark
Myosin reaches up and latches onto actin, forming crossbridges	1 mark
ATP is broken down & Crossbridges pull actin towards middle of sarcomere	1 mark
Causes z lines to move closer, H zone to decrease/disappear/sarcomere shortens	1 mark

- (d) Explain why the force that the muscle can produce is related to the velocity of contraction.

(2 marks)

Description	Marks
During concentric contraction, greater force produced at lower velocity of contraction	1 mark
This gives crossbridges more time to be recruited/more are recruited, therefore more force is able to be produced	1 mark

Question 22**(6 marks)**

- (a) Identify and explain two physiological responses to competing in the hot conditions in Doha. (4 marks)

<p>Increase in core body temperature</p> <ul style="list-style-type: none"> • due to outside temperature and body's metabolism whilst exercising <p style="text-align: center;">or</p> <ul style="list-style-type: none"> • due to inadequate homeostasis via other systems <p style="text-align: center;">or</p> <ul style="list-style-type: none"> • due to competition for blood between the muscles and the skin 	1–2
<p>Increase in heart rate (cardiac drift)</p> <ul style="list-style-type: none"> • elevated body temperature means blood must go to the skin to allow heat loss as well as muscles to continue exercising <p style="text-align: center;">or</p> <ul style="list-style-type: none"> • due to reduced blood volume/stroke volume 	1–2
<p>Increased cardiac output</p> <ul style="list-style-type: none"> • due to the body needs to increase the blood supply to go to the muscles as well as the skin. 	1–2
<p>Decreased cardiac output</p> <ul style="list-style-type: none"> • due to stroke volume decreasing the body is unable to keep up the demand for blood 	
<p>Increase in sweating</p> <ul style="list-style-type: none"> • due to the body losing heat through evaporation 	1–2
<p>Decrease stroke volume</p> <ul style="list-style-type: none"> • due to the reduction in blood volume through the loss of sweat 	1–2
<p>Increase in blood pressure</p> <ul style="list-style-type: none"> • due to increased blood viscosity/reduced blood volume resulting from the body sweating 	1–2
<p>Increased peripheral blood flow</p> <ul style="list-style-type: none"> • due to blood being redirected to the skin to dissipate heat through convection 	1–2
<p>Vasodilation of blood vessels in skin</p> <ul style="list-style-type: none"> • due to blood being redirected to the skin to dissipate heat through convection 	1–2
<p>Increased respiration/ventilation</p> <ul style="list-style-type: none"> • due to blood being diverted to skin the muscles require more O₂ delivered to them 	1–2
<p>Increase skin temperature</p> <ul style="list-style-type: none"> • due to radiation of the sun, conduction and convection 	1–2
<p>Decrease blood/plasma volume</p> <ul style="list-style-type: none"> • due to the increase in sweating <p style="text-align: center;">or</p> <ul style="list-style-type: none"> • Increase blood viscosity – blood viscosity is a measure of the resistance of blood to flow. It can also be described as the thickness and stickiness of blood. 	1–2
<p>Increase blood viscosity</p> <ul style="list-style-type: none"> • due to the reduction in blood volume through the loss of sweat 	1–2

- (b) Describe one method of heat transfer the athletes could have utilised during their event.

(2 marks)

Description	Marks
Convection – transfer of heat via currents running past the body. Athlete could use handheld fans, other example	1 mark to explain method, 1 mark for example of use
Conduction – transfer of heat from one object to another via contact. Athlete could use ice vests, ice packs etc.	1 mark to explain method, 1 mark for example of use
NOT RADIATION – can argue evaporation as have not stated that the humidity was high	

Question 23

(6 marks)

- (a) On the diagram below, label the fulcrum and resistance.

(2 marks)



Description	Marks
Labels fulcrum at axis point (left)	1 mark
Labels resistance as the green weight on the bar	1 mark

- (b) Classify the lever system above if the force is applied at the black “X”.

(1 mark)

Description	Marks
Identifies second class lever	1 mark

- (c) Using your knowledge of torque, explain the implications of applying the force at the white "X" instead of the black "X".

(3 marks)

Description	Marks
Defines torque as the turning effect created as a result of an eccentric force being applied around a fixed point or axis (or similar)	1 mark
Explains that applying the force at the white X instead of black X reduces the distance from the axis that force is applied (reduced moment arm)	1 mark
This means that the person needs to increase the force they apply to create the same amount of torque (ie apply more force to lift the bar than if they apply the force at the black X) or similar	1 mark

Question 24

(13 marks)

- (a) Outline the four (4) factors identified in Carron's model of group cohesion. Give an example of each factor in a state representative netball team.

(8 marks)

Description	Marks
Personal – characteristics of team members including motives for participating If the athletes have the same motivation ie all want to win the national championship then they will be more cohesive	1 mark to explain factor, 1 mark for application
Environmental – normative forces that hold a group together ie contracts that players need to abide by – if they believe that these are fair and equitable then they will be more cohesive	1 mark to explain factor, 1 mark for application
Leadership – characteristics of the coaches and leadership group If the style of leadership matches what the players need and want – ie democratic leader, then they will be more cohesive	1 mark to explain factor, 1 mark for application
Team – characteristics of the team including stability, successes and failures etc Maintaining the same playing group, shared understanding of tactics and strategies, prior successes and failures	1 mark to explain factor, 1 mark for application

(b) Identify two methods to increase task cohesion within the netball team.

(2 marks)

Description	Marks
<ul style="list-style-type: none"> Communicating clearly and regularly so all members understand their roles and responsibilities Having clear and understood expectations/roles/norms Making clear what each individual must do in order for the team to achieve its goals Developing pride within subunits – defence, midfield, attack Set challenging but realistic goals for the team as a whole and for individual players – players are involved in this process Being fair and consistent in dealing with the player group Prioritize team goals over individual goals Promote high levels of motivation Have regular team meetings – provides an opportunity for players to voice their opinion 	1 mark each for any two

(c) Explain three methods that a coach could utilise to measure group cohesion within their team.

(3 marks)

Description	Marks
Questionnaires – asks the players questions about levels and dimensions of task and social cohesion to test player satisfaction	1 mark
Sociograms – diagram which shows interrelationship between players within a team, uses answers to questionnaire	1 mark
Observation – coach can use checklist to observe players in team and see how they interact with each other.	1 mark

Question 25**(11 marks)**

In November 2019 a petition was begun to deny the city of Denver, Colorado (1603m above sea level) any professional sporting representation due to the altitude sickness experienced by visiting teams.



- (a) Explain three chronic adaptations to altitude that a Denver athlete may gain in order to place him at an advantage in a professional NFL football game.

(3 marks)

Description	Marks
<p>Increased haematocrit – increased red blood cell count and therefore increased ability to carry oxygen and deliver to muscle</p> <p>Increased mitochondria – increased aerobic respiration occurring in the body</p> <p>Increased aerobic enzymes – increases rate of aerobic respiration, increased oxygen unloading at the tissue</p> <p>Increased capillaries – increased blood supply around muscle and lungs – greater oxygen transfer</p> <p>Increased myoglobin – increased ability to carry oxygen in the muscle.</p>	<p>1 mark each for any three</p>

- (b) Once the petition was denied, visiting teams needed to quickly assess ways to acclimatise to the altitude conditions in Denver. Describe two methods that the teams could utilise to prepare for these conditions.

(4 marks)

Description	Marks
Live high, train low – athletes train at sea level to reduce detraining, but sleep at altitude to gain adaptations	1 mark to identify, 1 mark to explain
Live high, train high – athletes live and train at altitude, gain adaptations but at risk of detraining due to how difficult it is to train in hypoxic conditions.	1 mark to identify, 1 mark to explain

- (c) As well as the issues with altitude, many visiting teams complained of the impact of the very low temperatures in Denver. Describe two physiological implications of competing in the cold conditions as an NFL footballer.

(4 marks)

Description	Marks
Increased shivering – involuntary muscle contractions – this will decrease accuracy of passes and catches, as well as using up glycogen so athletes cannot play at a high intensity for as long	1 mark to explain, 1 mark to explain implication for performance
Increased peripheral vasoconstriction – this causes decreased muscle contraction in periphery – catching/accuracy etc	1 mark to explain, 1 mark to explain implication for performance

Question 26

(7 marks)

In the English Premier League soccer competition, new ball technology has ensured consistency across matches after many players were complaining that the ball was deflating slightly during the game, and this was causing their skill performance to decrease due to inconsistent bounce of the ball.

- (a) Identify and define the biomechanical principle utilised in this example.

(2 marks)

Description	Marks
Identifies coefficient of restitution	1 mark
Defines coefficient of restitution as a number between 0 and 1, measure of elasticity of object/surface, ratio of height dropped and height bounced (or similar)	1 mark

- (b) Explain the implications of a deflated ball in relation to the principle mentioned in part a).

(2 marks)

Description	Marks
Deflated ball does not bounce as high due to decreased coefficient of restitution	1 mark
This will make it difficult for the players to read the bounce of the ball – causing issues in game performance – or similar explanation relating change in ball pressure to performance (not simply restating question)	1 mark

- (c) One Premier League team in particular has been having additional issues with a number of players “slacking off” at training and not putting in 100% effort in games. Identify and define the psychological phenomenon occurring and provide one recommendation to reduce its likelihood in the team.

(3 marks)

Description	Marks
Identifies social loafing	1 mark
The tendency of an individual to decrease their performance/effort when part of a team	1 mark
<p>Write a team contract which states;</p> <p>Group expectations</p> <p>Individual responsibilities</p> <p>Forms of communication</p> <p>Methods of discipline</p> <p>Consequence of breaching team rules</p> <p>Develop rules of conduct;</p> <ul style="list-style-type: none"> • Establish rules of expected behaviour which will help the team achieve goals and objectives. <p>Create appropriate group sizes;</p> <ul style="list-style-type: none"> • Assigning too many members to an easy task encourages loafing. <p>Evaluate all members of a group individually</p> <ul style="list-style-type: none"> • Members will be more productive if they know that their individual contribution will be evaluated. <p>Rotate responsibility and positions where possible to maximise individual contribution</p> <p>Provide regular feedback to each individual player</p> <p>Make a roster to ensure all players assist with setting up and putting away equipment</p> <p>Set challenging individual and team goals for each training session</p>	1 mark

Question 27**(10 marks)**

Each year the Ironman Triathlon World Championships are held at Kona, Hawaii. The event comprises a 3.9km open water swim, 180km cycle and 42.2km run. The average athlete takes over 12 hours to complete the course.

- (a) Define the three types of drag experienced by a triathlete in the Ironman event. Explain one method the athlete could utilise to reduce each type of drag.

(6 marks)

Description	Marks
Defines surface drag as the drag created between the surface of an object and the fluid moving past it	1 mark
Reduce surface drag by shaving down, reducing surface area in contact with the fluid	1 mark
Defines wave drag as the friction created by the interaction between fluids – swimmer being at the surface of the water	1 mark
Reduce wave drag by streamlining, staying underwater for as long as possible	1 mark
Defines form drag as the resistance created by a pressure differential between front and back of an object moving through a fluid	1 mark
Reduces form drag by reducing cross sectional area, running/swimming in another athlete's wake (NOT cycling leg)	1 mark

- (b) Due to the extreme length of the event, athletes must have a strict and well-planned nutrition program. Explain the nutrition plan for a triathlete pre- and during the Ironman event.

(4 marks)

Description	Marks
Pre event: <ul style="list-style-type: none"> Carbo loading – 7-10g/kg low GI carbohydrate to increase glycogen storage and have prolonged energy release throughout race Pre event meal – 2g/kg low GI to top up storage and prolonged release Hydration – 600ml 3-4hrs prior, 400ml just before to prime stomach and reduce risk of dehydration 	1 mark each for any two If correct info but no WHY – max 1 out of possible 2 marks
During event: <ul style="list-style-type: none"> 1g/kg high GI carbohydrate every hour – increases blood glucose allowing for an immediate source of energy to spare stored glycogen 	1 mark each for any two If correct info but no WHY – max 1 out of possible 2 marks

- Hydration – approx. 200ml every 15min during activity
– electrolytes too, avoid dehydration

Question 28**(7 marks)**

- (a) The following table includes the key properties for the three types of muscle fibres. Complete the table by filling in the information for the unshaded boxes.

(4 marks)

Property	Muscle fibre types		
	Type I	Type IIa	Type IIb
Resistance to fatigue	High	Moderate	Low
Contractile speed	Slow	Fast	
Major energy source	Aerobic	Anaerobic/Lactic Acid	ATP-PC

- (b) Being low in organisation yet high in complexity, the javelin event is a difficult skill to teach to young athletes. Identify and explain the coaching activity best utilised in teaching this skill. Justify your answer.

(3 marks)

Description	Marks
Identifies chaining	1 mark
Involves breaking the skill down into its component parts and then sequentially learning each component one at a time	1 mark
Not shaping because low in organisation – the parts don't rely heavily on each other and can therefore be taught/learned in parts.	1 mark

End of Section Two**See Next Page**

Section Three: Extended answer**30% (30 marks)****Question 29****(15 marks)**

Loris Karius is a German professional soccer player who formerly played as a goalkeeper for Premier League club Liverpool. Following the 2018 Champions League Final vs Real Madrid, Karius was blamed for the team's loss, having made two crucial mistakes during the fixture.

(a) Explain the role of the following parts of the nervous system, and how they would function together to allow Karius to attempt to save a shot on goal.

- Spinal cord
- Sensory neurons
- Motor neurons
- Brain
- Motor unit

(10 marks)

Description	Marks
Sensory Neuron – sensory receptors in the eyes see the ball kicked off the boot Pass information from the sensory receptors to the brain	1-2
Brain – receives information from the sensory neuron, interprets the information and makes decisions based on these inputs e.g. move in the direction of the ball Sends information to the spinal cord	1-2
Spinal cord – connects CNS to PNS. Receives information from the brain. Sends information to the motor neuron/PNS	1-2
Motor neuron – receives information from the spinal cord/CNS. neuron that conveys impulses from the CNS to the muscle fibres via its axons	1-2
Motor unit – the motor neuron and all the fibres it innervates. The motor neuron receives signal to cause contraction (innervation/stimulation) of the associated muscle fibres	1-2

In an attempt to address all concerns, Liverpool's goal keeping coach undertook a comprehensive review following the game into Karius' technique.

(b) Identify a qualitative model the coach might have employed to analyse Karius' technique and explain the structure of this model.

See Next Page

(5 marks)

Description	Marks
Knudsen & Morrison model of Qualitative Analysis.	1
1. Preparation - develop pre-requisite knowledge base about goal keeping. Perhaps develop a checklist	1 mark description of each stage Total – 4 marks
2. Observation - the coach gathers and sources the information / records and measures the movement/ systematic gathering of information	
3.Evaluation - Identify the strengths and weaknesses of the Karius, prioritise in order of importance for correction and identify methods which can be used to improve performance	
4. Intervention - provide feedback to the Karius and strategies for improvement	

Question 30**(15 marks)**

Ellyse Perry is an Australian sportswoman who has represented her country in both cricket and soccer, debuting for both national teams at the age of 16. Perry is the youngest Australian to play international cricket and the first to have appeared at both the cricket and soccer World Cups.

- (a) Explain the categories of transfer of learning as they relate to this example. Outline the effects of transfer and identify how two effects best relate to Perry's transition between cricket and soccer.

(8 marks)

Description	Marks
Skill to skill – when a skill learned in one situation has an effect on a skill in a different situation	1 mark
Training to competition – when skills learnt in training are developed into competition/game situations	1 mark
Theory to practice – the transfer of theoretical skills into a performance scenario	1 mark
Positive – when a skill learnt in one sport benefits a skill learnt in another sport	1 mark
Negative – when a skill learnt in one sport hinders a skill learnt in another sport	1 mark
Zero – when a skill learnt in one sport has no effect on a skill learnt in another sport	1 mark
Positive – any positive skill transfer between cricket and soccer	1 mark
Zero – any zero transfer between cricket and soccer	1 mark

As the nominated free-kick specialist in her team, Perry is often required to “curl” the ball around the wall of players and past the goalkeeper.



- (b) Explain the Magnus Effect as it relates to the application of side spin on the soccer ball. Use a diagram to support your answer.

See Next Page

(7 marks)

Description	Marks
Diagram: <ul style="list-style-type: none"> Correctly labelled direction of motion, spin, air resistance Correctly labelled high and low pressure areas, magnus force through middle of ball 	1 mark each dotpoint (2 marks total)
Magnus effect – the way an object's flight path through fluid is affected by spin OR application of eccentric/off centre force causes spin	1 mark
On one side of ball, boundary layer is travelling in same direction as air resistance, opp direction on other side	1 mark
Where travelling in same direction, this causes high velocity of air particles and therefore low pressure	1 mark
Where travelling in opp direction, this causes low velocity of air particles and therefore high pressure	1 mark
Objects move high to low pressure, therefore ball's flight path will deviate to side with low pressure	1 mark

Question 31**(15 marks)**

Between August 2014 and March 2015, the Australian Men's Cricket team had arguably one of their busiest summers. They played a four match test series against India in September, followed by one day matches and a T20 series against South Africa and England in December/January before the Cricket World Cup in February.

- (a) Using your knowledge of periodisation, explain the application of the principles of peaking, tapering, and recovery in the annual plan for the team.

(9 marks)

Description	Marks
Diagram: <ul style="list-style-type: none"> Correctly labelled direction of motion, spin, air resistance Correctly labelled high and low pressure areas, magnus force through middle of ball 	1 mark each dotpoint (2 marks total)
Magnus effect – the way an object's flight path through fluid is affected by spin OR application of eccentric/off centre force causes spin	1 mark
On one side of ball, boundary layer is travelling in same direction as air resistance, opp direction on other side	1 mark
Where travelling in same direction, this causes high velocity of air particles and therefore low pressure	1 mark

Where travelling in opp direction, this causes low velocity of air particles and therefore high pressure	1 mark
Objects move high to low pressure, therefore ball's flight path will deviate to side with low pressure	1 mark

“The Test: A new era for Australia’s team” is a docuseries following the Australian Men's Cricket Team, offering a behind the scenes look at how one of the world's best cricket teams fell from grace and was forced to reclaim their title and integrity. A key member of the series is head coach Justin Langer, given the role of rebuilding both the team and trust of the Australian public.

- (b) Discuss the different styles of leadership Justin could have used throughout his time as Australian coach as well as a particular situation that would have best suited each leadership style.

(6 marks)

Coaching style	Advantage	Disadvantage	Most appropriate
Laissez Faire	<ul style="list-style-type: none"> Athletes learn to function on their own Athletes who are intrinsically motivated Experienced athletes allowing for creativity, eg strategies, game plans Training can be fun with little pressure to perform 	<ul style="list-style-type: none"> Players can waste time and fool around Risky or dangerous if not correct discipline in place Players may lack direction Coaching program can lack structure and progression Coach appears to lack interest and limited learning takes place Inexperienced players do not know what to do and learn little 	<ul style="list-style-type: none"> Pre season – see who demonstrates leadership Athletes who value socialisation and participation Athletes who are intrinsically motivated Experienced performers – can work out their own strategies Athletes who only need advice before they make the final decision
Democratic	<ul style="list-style-type: none"> Mutual respect leads to high levels of team spirit Players feel they have an ownership of the team and the decisions made 	<ul style="list-style-type: none"> Can waste time debating or deciding best way to move forward Too many different opinions can lead to confusion Some athletes may try and take over decision making from the coach Some athletes perform better when given clear instructions about their roles 	<ul style="list-style-type: none"> Experienced athletes who want input into decision making Athletes who are intrinsically motivated Athletes who want to create their own solutions to problems When there is plenty of time available for decisions to be made

Authoritarian	<ul style="list-style-type: none"> • Fear of consequences of failure motivates some players • Clear expectation of roles – effective when limited time available • Very effective in potentially dangerous situations 	<ul style="list-style-type: none"> • Not as much fun • Too strict • Players may feel anxious as coaching style is too harsh/critical • Too many rules restrict players • Can lead to player / coach conflict • Less effective when team is losing 	<ul style="list-style-type: none"> • Athletes who need direction and focus • Athletes who value extrinsic motivation • Athletes who want to know where they stand • Young athletes who are learning the game • When safety is a concern • When there is little time available and direction is required immediately
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Question 32**(15 marks)**

USA gymnast Simone Biles made headlines in 2020 by posting a video of her completion of a brand new vaulting stunt, prompting the naming of the “Biles Vault”.



(a) Using your knowledge of biomechanics, explain the application of the following principles in the vault event:

- Conservation of angular momentum
- Segmental interaction
- Force-Time

(9 marks)

Description	Marks
<p>Conservation of angular momentum: amount of angular motion possessed by a body in flight remains constant (or similar)</p> <p>Once Biles' body leaves the vault – she can manipulate ang mom through body position:</p> <ul style="list-style-type: none"> • Brings mass of body close to axis to rotate quickly with low moment of inertia • Moves mass of body further away from axis to slow rotation and get ready for safe landing 	<p>1 mark for definition 2 marks for explanation</p>
<p>Segmental interaction: transfer of momentum/force across body segments for optimal use (strength or accuracy)</p> <ul style="list-style-type: none"> • Biles wants to jump with optimal force – ensures previous segment has reached optimal velocity before next begins • Ensures body part is balanced • Uses larger slower segments first and then smaller faster • Uses as many body segments as possible 	<p>1 mark for definition 2 marks for explanation</p>
	1 mark

- (b) Explain three ergogenic aids that would benefit the performance of a gymnast. In your answer you must detail the specific advantage that the athlete may gain from the use of the aid.

(6 marks)

END OF EXAMINATION

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[illegible]

[illegible]

[illegible]

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