



Curriculum Council
Government of Western Australia



Western Australian Certificate of Education Marking Guidelines, Sample 2008

PHYSICAL EDUCATION STUDIES

SECTION ONE: MULTIPLE-CHOICE

(15 MARKS)

Question	Answer	Marks
1	A	1
2	A	1
3	D	1
4	C	1
5	B	1
6	D	1
7	B	1
8	C	1
9	C	1
10	C	1
11	D	1
12	C	1
13	B	1
14	B	1
15	B	1

SEE NEXT PAGE

SECTION TWO: SHORT RESPONSE

(45 MARKS)

OPTION A: CANDIDATES FOR 2A/2B

Question 1

(15 Marks)

Refer to the following diagrams, which show an athlete performing the overarm throw on two separate occasions.

- (a) Compare the two pairs of diagrams above. Which action (A or B) would enable the person to throw the furthest if all other factors were constant?

(1 mark)

Description	Marks
<i>Action B</i>	1

- (b) With reference to the diagrams, identify and explain three biomechanical principles that apply to the successful performance of an overarm throw for maximal distance.

(6 marks)

Description	Marks
<i>Optimal projection – throwing object at optimal angle</i>	1 for name and 1 for description
<i>Force – motion – use of coordination and strength to change the state of motion of the ball.</i>	1 for name and 1 for description
<i>Segmental interaction – the ability to perform the skill whilst transferring energy across various muscles in correct sequence.</i>	1 for name and 1 for description

- (c) Identify four stages in the observation and analysis process for skill development.

(8 marks)

Description	Marks
<i>Preparation -What is the phasing in an action – Pre (preparation), action (during), post (follow through)</i>	1 for name and 1 for description
<i>Observation – appropriate viewing angle. Order of components related to how action is visually scanned – ground up</i>	1 for name and 1 for description
<i>Evaluation – Identification of desirable and undesirable aspects of the performance.</i>	1 for name and 1 for description
<i>Intervention – providing feedback and correctional strategies to improve performance</i>	1 for name and 1 for description

OPTION A: CANDIDATES FOR 2A/2B

Question 2

(15 Marks)

A state level athlete has been performing below his potential for the last few months and is struggling to make the National squad. The athlete can't explain his poor form and has asked a senior club member to attend a number of training sessions to see if there are any obvious training issues which may be affecting his performance. The club member notices that the coach speaks to the athlete in a short, sharp dictatorial manner. There is minimal technical instruction or feedback and little direction or focus given to the athlete.

- (a) Summarise the style of leadership that has been demonstrated by the coach.

(2 marks)

Description	Marks
<i>Autocratic</i>	1
<i>Coach has complete power, leadership by command without consultation</i>	1

- (b) Describe four qualities a coach may display as an effective leader.

(4 marks)

Description	Marks
<i>Chose any 4 from the list below</i>	1 mark for each of the 4 explanations
<i>Intuition- Instinct, inspiration</i>	
<i>Humanity- put team members first and be willing to listen to them.</i>	
<i>Self – Motivation – ability to motivate others with their own enthusiasm.</i>	
<i>Loyalty- Ability to support all aspects of the team.</i>	
<i>Compassion- Understand others feelings.</i>	
<i>Confidence- Belief in oneself to make the correct decisions.</i>	
<i>Courage- Do what is right regarding the needs of team members.</i>	
<i>Judgement- Ability to make decisions logically after considering all factors.</i>	
<i>Integrity- Ability to act honestly and with appropriate behaviour.</i>	

- (c) State how debriefing could assist the coach to enhance the athlete's performance.
(3 marks)

Description	Marks
<i>Athlete would be able to express feelings/thoughts</i>	1
<i>Coach could assess how successful that athlete has been in applying skill instruction</i>	1
<i>To foster a positive relationship through communication</i>	1

- (d) Explain what purpose front loading would have in an interaction between this coach and the athlete?
(3 marks)

Description	Marks
<i>Letting the athlete know what the point of activity is</i>	1
<i>Athlete can focus on a specific aspect of the training or his performance for improvement</i>	1
<i>Review learning from previous sessions</i>	1

- (e) List three techniques of communication that could be used by the coach to improve her interaction with the athlete?
(3 marks)

Description	Marks
<i>Two-way</i>	1
<i>By using verbal and non-verbal messages, greater understanding</i>	1
<i>By using sender and receiver approaches, avoid misunderstanding of the message</i>	1

OPTION A: CANDIDATES FOR 2A/2B

Question 3

(15 Marks)

People often say sport is '10% physical and 90% mental'. It is not uncommon for individuals or teams that are losing at half time or part way through a match to win the game. Mentally these athletes must be able to remain focussed throughout the entire match.

- (a) Outline the difference between short and long term goals with reference to the situation described above and a sport of your choice.

(3 marks)

Description	Marks
<i>Long term goals are set for the completion of a phase such as a year or season. Short term goals are those used to build on and achieve long term goals such as weekly training schedule or practising strategies.</i>	2 1 for each definition
<i>Response may vary depending on scenario chosen e.g. soccer team losing at half time, opposition goals scored through heading by taller players. By re-assessing goals set before the game and changing to using low, quick passes, the team is able to overcome the issue of height difference.</i>	1

- (b) For the situation described above, it will be extremely important that all team members remain in their optimal arousal zone. Explain the arousal zones of the Inverted U Hypothesis and the impact these have on performance.

(6 marks)

Description	Marks
<ul style="list-style-type: none"> ▪ <i>Low level – associated with boredom and/or lack of interest.</i> ▪ <i>Optimal – area for optimal performance.</i> ▪ <i>High level – associated with anxiety and high tension.</i> 	3 Each must have ALL names AND descriptions
<ul style="list-style-type: none"> ▪ <i>Low level – not mentally prepared for competition leading to lower levels of performance.</i> ▪ <i>Optimal – this results in the highest possible levels of performance.</i> ▪ <i>High level – athlete experiences levels of arousal which will detract from performance.</i> 	3 Each must have correct description

- (c) At half time, if athletes are feeling overwhelmed or are concerned with their poor judgements on the field, they may need to undertake some relaxation. Briefly explain three types of relaxation that could be used in this situation.

(3 marks)

Description	Marks
<i>Breathing techniques – controlled breathing used to refocus on key aspects of the competition/match.</i>	1
<i>Progressive muscle relaxation – involves the progressive tension and relaxation of major muscle groups.</i>	1
<i>Self hypnosis – Involves athletes blocking out negative thoughts and replacing them with positive ones</i>	1

- (d) A coach believes an umpire has unfairly penalised her team in the first half and is causing it to lose. Describe three problems that could arise for the losing athlete's mental set if a coach focuses on the perceived poor umpiring decisions in her half time address.

(3 marks)

Description	Marks
<i>Players' focus is on an external factor out of their control (inappropriate focus).</i>	1
<i>Players lose emotional control and react negatively to the umpire (umpire abuse).</i>	1
<i>Player becomes anxious and plays tentatively rather than confidently (self efficacy).</i>	1

SECTION TWO: SHORT RESPONSE

(45 MARKS)

OPTION B: CANDIDATES FOR 2B/3A

Question 1

(15 Marks)

People often say sport is '10% physical and 90% mental'. It is not uncommon for individuals or teams that are losing at half time or part way through a match to win the game. Mentally these athletes must be able to remain focussed throughout the entire match.

- (a) Outline the difference between short and long term goals with reference to the situation described above and a sport of your choice.

(3 marks)

Description	Marks
<i>Long term goals are set for the completion of a phase such as a year or season. Short term goals are those used to build on and achieve long term goals such as weekly training schedule or practising strategies.</i>	2 1 for each definition
<i>Response may vary depending on scenario chosen e.g. soccer team losing at half time, opposition goals scored through heading by taller players. By re-assessing goals set before the game and changing to using low, quick passes, the team is able to overcome the issue of height difference.</i>	1

- (b) For the situation described above, it will be extremely important that all team members remain in their optimal arousal zone. Explain the arousal zones of the Inverted U Hypothesis and the impact these have on performance.

(6 marks)

Description	Marks
<ul style="list-style-type: none"> ▪ <i>Low level – associated with boredom and/or lack of interest.</i> ▪ <i>Optimal – area for optimal performance.</i> ▪ <i>High level – associated with anxiety and high tension.</i> 	3 Each must have ALL names AND descriptions
<ul style="list-style-type: none"> ▪ <i>Low level – not mentally prepared for competition leading to lower levels of performance.</i> ▪ <i>Optimal – this results in the highest possible levels of performance.</i> ▪ <i>High level – athlete experiences levels of arousal which will detract from performance.</i> 	3 Each must have correct description

- (c) At half time, if athletes are feeling overwhelmed or are concerned with their poor judgements on the field, they may need to undertake some relaxation. Briefly explain three types of relaxation that could be used in this situation.

(3 marks)

Description	Marks
<i>Breathing techniques – controlled breathing used to refocus on key aspects of the competition/match.</i>	1
<i>Progressive muscle relaxation – involves the progressive tension and relaxation of major muscle groups.</i>	1
<i>Self hypnosis – Involves athletes blocking out negative thoughts and replacing them with positive ones</i>	1

- (d) A coach believes an umpire has unfairly penalised her team in the first half and is causing it to lose. Describe two problems that could arise for the losing athlete's mental set if a coach focuses on the perceived poor umpiring decisions in her half time address.

(3 marks)

Description	Marks
<i>Players' focus is on an external factor out of their control (inappropriate focus).</i>	1
<i>Players lose emotional control and react negatively to the umpire (umpire abuse).</i>	1
<i>Player becomes anxious and plays tentatively rather than confidently (self efficacy).</i>	1

OPTION B: CANDIDATES FOR 2B/3A

Question 2

(15 Marks)

The graph below shows the relationship between the number of motor units contracting and the total tension developed in a muscle from three different athletes.

- (a) Describe the effect of increasing the number of motor units contracting on the potential to develop muscle tension.

(1 mark)

Description	Marks
<i>Direct relationship, as the number of units increases so does the muscle tension.</i>	1

- (b) Identify which line best represents a strength-trained athlete and explain your answer.

(2 marks)

Description	Marks
<i>Line A</i>	1
<i>There is greater tension or strength developing in the muscles in relation to the decreased number of motor units contracting.</i>	1

- (c) The coach of a weightlifter is training to peak her athlete for a major competition. Outline the application of peaking and periodisation and how they would underpin the training program to ensure that the athlete peaks at the right time and avoids overtraining.

(4 marks)

Description	Marks
<i>Peaking – point at which performance gains are maximised prior to competition</i>	1
<i>Application – final phase of training prior to a competition involves tapering to <u>decrease</u> training <u>volume</u> for <u>recovery</u> (taper). Overtraining can occur if peak is too early in the season</i>	1 all three terms required - application
<i>Periodisation – phasing the training in the competition cycle – not the same training load all the time</i>	1
<i>Involves planned variations in volume & intensity to maximise performance and avoid overtraining</i>	1 application

- (d) List four variables that you would monitor as indicators of overtraining and explain what you would be looking for from each observation.

(8 marks)

Description	Marks
<p>List any 4 from:</p> <ul style="list-style-type: none"> ▪ <i>Heart rate – Increase in resting heart rate and max heart rate, keeping it in an ideal range for that particular athlete.</i> ▪ <i>Muscle Soreness – Persistent muscle and joint soreness.</i> ▪ <i>Fatigue – Prolonged fatigue.</i> ▪ <i>Concentration levels – A decrease in concentration levels.</i> ▪ <i>Motivation / depression – Signs of boredom and decreased motivation. Loss of competitive drive and enthusiasm.</i> ▪ <i>Coordination – decrease in coordination.</i> ▪ <i>Mood – easily irritated and moody. Signs of anger, anxiety or depression.</i> ▪ <i>Increased negative feelings – reduced confidence and helplessness.</i> ▪ <i>Illnesses – prolonged illnesses and more frequent illnesses.</i> ▪ <i>Appetite – decrease in appetite and weight loss.</i> ▪ <i>Injuries – prolonged injuries.</i> ▪ <i>Sleep patterns – interrupted sleeping patterns or increased insomnia.</i> ▪ <i>Recovery from training – delayed recovery from training.</i> 	<p style="text-align: center;">0 – 8 1 mark for each variable and 1 mark for the explanation</p>

OPTION B: CANDIDATES FOR 2B/3A

Question 3

(15 Marks)

An Indigenous athlete living away from home for the first time is struggling to achieve in an Australian Football League (AFL) team and to cope with the lifestyle changes involved.

As the coach of this athlete, suggest **three ways** you may manage change in **each** of the following areas to support him to reach his goal of being successful both on and off the field.

- (i) Economic
- (ii) Social
- (iii) Cultural
- (iv) Emotional
- (v) Physical

(15 Marks)

Description	Marks
<p><i>Economic – Cost of living / expenses</i></p> <ul style="list-style-type: none"> - <i>billeting player with a family</i> - <i>providing skills for budgeting</i> - <i>facilitate finding employment opportunities</i> 	3
<p><i>Social – status within team</i></p> <ul style="list-style-type: none"> - <i>Sociogram to identify affiliations within the team (team cohesion) and establish support</i> - <i>Establish regular communications with family members – to reduce sense of isolation from family</i> - <i>Off field behaviour expectations</i> 	3
<p><i>Cultural –</i></p> <ul style="list-style-type: none"> - <i>Buddy player with other established Indigenous players</i> - <i>Ensure cultural awareness training with club officials</i> - <i>Education for all team members on cultural differences</i> 	3
<p><i>Emotional – self concept</i></p> <ul style="list-style-type: none"> - <i>Goal setting ST & LT within football & outside football</i> - <i>Institute stress management strategies with player</i> - <i>Develop and teach motivational techniques</i> 	3
<p><i>Physical – training</i></p> <ul style="list-style-type: none"> - <i>Thorough assessment of current physical capacities & physical maturity</i> - <i>Plan individualised weights & fitness program based on individual needs</i> - <i>Match physical contests with similarly skilled and similar body size</i> - <i>Assess technique to avoid injury</i> 	3 Any 3 of those listed

SECTION TWO: SHORT RESPONSE

(45 MARKS)

PART C: CANDIDATES FOR 3A/3B

Question 1

(15 Marks)

An Indigenous athlete living away from home for the first time is struggling to achieve in an Australian Football League (AFL) team and to cope with the lifestyle changes involved.

As the coach of this athlete, suggest **three ways** you may manage change in **each** of the following areas to support him to reach his goal of being successful both on and off the field.

- (i) Economic
- (ii) Social
- (iii) Cultural
- (iv) Emotional
- (v) Physical

(15 Marks)

Description	Marks
<p><i>Economic – Cost of living / expenses</i></p> <ul style="list-style-type: none"> - <i>billeting player with a family</i> - <i>providing skills for budgeting</i> - <i>facilitate finding employment opportunities</i> 	3
<p><i>Social – status within team</i></p> <ul style="list-style-type: none"> - <i>Sociogram to identify affiliations within the team (team cohesion) and establish support</i> - <i>Establish regular communications with family members – to reduce sense of isolation from family</i> - <i>Off field behaviour expectations</i> 	3
<p><i>Cultural –</i></p> <ul style="list-style-type: none"> - <i>Buddy player with other established Indigenous players</i> - <i>Ensure cultural awareness training with club officials</i> - <i>Education for all team members on cultural differences</i> 	3
<p><i>Emotional – self concept</i></p> <ul style="list-style-type: none"> - <i>Goal setting ST & LT within football & outside football</i> - <i>Institute stress management strategies with player</i> - <i>Develop and teach motivational techniques</i> 	3
<p><i>Physical – training</i></p> <ul style="list-style-type: none"> - <i>Thorough assessment of current physical capacities & physical maturity</i> - <i>Plan individualised weights & fitness program based on individual needs</i> - <i>Match physical contests with similarly skilled and similar body size</i> - <i>Assess technique to avoid injury</i> 	3 Any 3 of those listed

OPTION C: CANDIDATES FOR 3A/3B

Question 2

(15 Marks)

It can be said that: '***A champion team will always beat a team of champions.***'

- (a) Define group cohesion.

(2 marks)

Description	Marks
<i>The degree to which a team has bonded</i>	1
<i>Demonstrating collective cooperation</i>	1

- (b) Identify four factors outlined in Carron's model that may affect group cohesion. Give an example for each factor.

(8 marks)

Description	Marks
<i>Environmental – forces holding the group together. e.g. Expectations of others, scholarships, contracts, age and size of groups</i>	1 for name and 1 for example
<i>Personal – individual characteristics of group members. e.g. Motives for participating. Task motivation, affiliation motivation and self motivation.</i>	1 for name and 1 for example
<i>Leadership – the style of leadership and the relationships developed. e.g. The role of the leader is critical in the development of group cohesion</i>	1 for name and 1 for example
<i>Team – relates to the characteristics of the task. e.g. Individual compared to team sports, the desire for group success</i>	1 for name and 1 for example

(c) Identify five things a coach can do to build group cohesion.

(5 marks)

Description	Marks
<i>List any five of the following:</i>	1
<i>Make people feel valued by arranging regular meetings</i>	1
<i>Have clear goals</i>	1
<i>Develop a team ethos, pride and identity</i>	1
<i>Try to keep personnel stable</i>	1
<i>Be personal yet professional</i>	1
<i>Create opportunities to get to know others</i>	1
<i>Resolve conflicts quickly and fairly</i>	1

OPTION C: CANDIDATES FOR 3A/3B

Question 3

(15 Marks)

Tennis player Maria Isitallova won a record 167 singles titles and 172 doubles titles. Seventeen years later she again competed in events on the women's tour at the age of 47.

The following changes occur with ageing and will have decreased Maria's aerobic capacity and performance. Explain how each of these factors will lead to a decrease in aerobic capacity.

- (a) Decreased size and number of skeletal muscle mitochondria

(2 marks)

Description	Marks
<i>Mitochondria convert glucose to ATP.</i>	1
<i>Reduced muscle mass, associated with aging, also leads to reduced mitochondria which in turn results in reduced aerobic capacity.</i>	1

- (b) Decreased stroke volume

(2 marks)

Description	Marks
<i>Stroke volume refers to the amount of blood pumped with each contraction.</i>	1
<i>With less blood and therefore less O₂, VO₂ max reduces with age leading to decreased aerobic capacity.</i>	1

- (c) Decreased capillarisation

(2 marks)

Description	Marks
<i>Capillarisation decreases with age and with subsequent reduced training.</i>	1
<i>Capillarisation is the capacity to carry blood (and therefore O₂) to working muscles and in turn this leads to decreased aerobic capacity.</i>	1

- (d) Identify three other physiological changes Maria may experience due to aging.

(3 marks)

Description	Marks
<i>Body fat content increases whilst fat-free mass decreases</i>	1
<i>Decrease in bone density due to decrease in oestrogen levels for females.</i>	1
<i>Flexibility of joints decrease.</i>	1

Maria has spent her life playing and training at or around sea-level. In the modern era she must play a series of qualifying tournaments at various remote high altitude locations designed to broaden the tennis market.

- (e) Identify three key physiological changes that occur when competing at high altitude. What effect will each have on her performance?

(6 marks)

Description	Marks
<p><i>Higher respiration rates and loss of fluids</i></p> <ul style="list-style-type: none"> - <i>Causes dehydration resulting in poorer endurance.</i> 	1 mark for physiological change and 1 mark for effect
	1
<p><i>Lower concentration O₂ leading to lower levels of O₂ available for working muscles.</i></p> <ul style="list-style-type: none"> - <i>Causing lower muscle endurance and strength</i> 	1
	1
<p><i>Lower O₂ affects brain metabolism</i></p> <ul style="list-style-type: none"> - <i>Causes severe headaches and some disorientation resulting in slower reactions (and altitude sickness) if not acclimatised</i> 	1
	1

SECTION THREE: EXTENDED RESPONSE

(40 MARKS)

Question 1

(20 Marks)

In relation to this sudden announcement of a highly talented young cricketer's retirement:

- (a) Identify and explain the impact of a key physical, mental and social factor that played a role in this particular case of burnout.

(6 marks)

Description	Marks
<i>Physical – recurring injury to elbow and surgery.</i>	1
<i>Impact: Playing with pain and recurring injury which spread to other muscle groups and also required painful follow-up surgery</i>	1
<i>Mental – performance anxiety and emotional exhaustion.</i>	1
<i>Impact: Playing without confidence or love and enjoyment of the game.</i>	1
<i>Social – as young cricketer of the year; fan expectation.</i>	1
<i>Media expectations and lifestyle of professional cricketer.</i>	1

(b) As his coach, develop and justify holistic strategies to facilitate both his mental and physical recovery to play elite cricket again, including:

- goal setting
- managing stress and anxiety
- decision making

(7 marks)

Description	Marks
<p><i>Describe the general nature of this issue in this case - dealing with a player with chronic and recurring problems. The player had high expectations placed on him; failure to meet up to expectations has caused anxiety and depression, 'emotional exhaustion'</i></p>	<p>1</p>
<p><i>Goal setting:</i></p> <ul style="list-style-type: none"> - <i>as a link to assisting athlete motivation;</i> - <i>clarify short term physical goals e.g., rest from bowling, take up swimming or another physical recreational activity the payer enjoys;</i> - <i>establish relevant longer term goals –establish a progressive, muscle strengthening and flexibility program for hamstring and back muscles</i> 	<p>2 (any 2 of the 3)</p>
<p><i>Managing stress and anxiety:</i></p> <ul style="list-style-type: none"> - <i>Introduce the concept of resilience as it applies to burnout and recovery</i> - <i>Consider a model of behaviour such as "social cognitive model"</i> - <i>Identify relevant strategies to support e.g., counselling to help player identify source of stress; linking with others who have experienced it (role modelling)</i> - <i>e.g., teach strategies such as meditation; and handling the media scrutiny</i> 	<p>2 (any 3 of the 4)</p>
<p><i>Decision making:</i></p> <ul style="list-style-type: none"> - <i>Discuss relevant models for long term decision making and solution focused decision making</i> - <i>Values associated with sustained physical activity fro wellbeing</i> - <i>Discuss life skills such as planning, goal setting and checking progress</i> - <i>Self awareness and responsibility for future decisions and actions</i> 	<p>2 (any 3 of the 4)</p>

- (c) You attended a recent coaches conference at which a key topic of discussion was “Cricket authorities do not and should not have a role in player burnout”. Present an argument against this proposition by addressing factors related to holistic, long term player well being, including codes of ethics in sport.

(7 marks)

Description	Marks
<i>Definition of ‘player burnout’: player who has developed a range of chronic injuries, motivation and mental problems and has become socially more isolated within the team to the extent that s/he can no longer perform anywhere near their potential best.</i>	2 for holistic factors; 1 for a single factor answer
<i>Address common features in burnout - overuse (within the team, overexposure to excessive training loads/levels and overexposure (in the media spotlight) as a potential cause of burnout.</i>	1
<i>Analyse and apply codes of ethics in relation to player health and well being e.g., Australian Sports Commission; Department for Sport and Recreation; Coaches code of ethics addressing player wellbeing.</i>	2
<i>Address the place of equity and social justice in developing policy if the current authority’s view is ‘no role to play’; a contracted player.</i>	2

Question 2

(20 Marks)

Using your knowledge of environmental conditions select an outdoor team sport that you are familiar with and explain how you would adjust your skills, tactics and strategies to optimise your performance in the following situations:

- wet weather
- hot, dry conditions
- freezing
- windy conditions

Allocation of marks (any 5 in each category)

Wet weather

<i>Skills</i>	<i>Tactics</i>	<i>Strategies</i>
<i>Strive for basic execution not complex moves</i>	<i>Exploit own strengths to gain position</i>	<i>Need to consider equipment selection</i>
	<i>Select a formation of play to adapt to the wet</i>	<i>Consider the playing surface</i>

Hot dry conditions

<i>Skills</i>	<i>Tactics</i>	<i>Strategies</i>
<i>Select skills that are slower in tempo</i>	<i>Time movements so that they are efficient and conserve energy</i>	<i>Wear lightweight, breathable clothing</i>
<i>Be aware of the affect of temperature on ball flight</i>	<i>Do not show how tired you are (i.e. mental training)</i>	<i>Hydrate</i>
		<i>Ice jackets</i>

Freezing conditions

<i>Skills</i>	<i>Tactics</i>	<i>Strategies</i>
<i>Simplify movements</i>	<i>Extensive warm up</i>	<i>Wear thermal clothing</i>
	<i>Keep moving when not involved in play</i>	<i>Acclimatise</i>

Windy conditions

<i>Skills</i>	<i>Tactics</i>	<i>Strategies</i>
<i>Concentrate and focus on simple execution</i>	<i>Vary the direction and angle of passes</i>	<i>Using smaller steps, paces</i>
	<i>Use the wind to advantage</i>	<i>Lowering the COG</i>

SEE NEXT PAGE

SECTION THREE: EXTENDED RESPONSE

Question 3

(20 Marks)

- (a) Describe the optimal sequencing of body parts involved in performing a well coordinated tennis forehand stroke as shown in the picture above. Integrate movement (biomechanical) principles into the optimal sequencing that you suggest to help justify your answer.

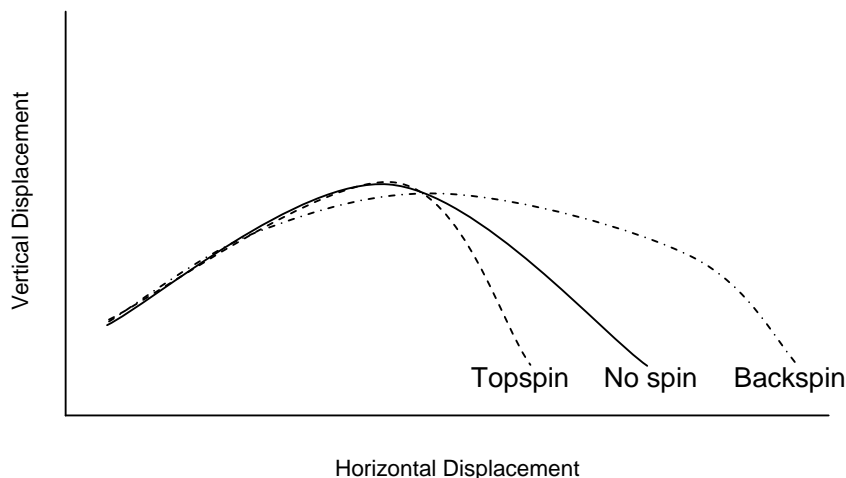
(5 marks)

Description	Mark
<i>Sequential movement of the body parts from the largest and strongest segments through to the smallest and fastest</i>	1
<i>The stronger and larger muscles of the thighs and trunk are moved first in the tennis forehand followed by the smaller and faster muscles of the shoulders and arms</i>	1
<i>Important to sequentially stabilise each segment so that the next segment accelerates around a stable base to transfer momentum</i>	1
<i>Incorporating a number of body parts into the tennis forehand action allows maximum time and distance for the summation of momentum, because force can be applied over the maximum possible time</i>	1
<i>Follow through with the racquet to ensure there is no deceleration of the racquet before contact with ball</i>	1

- (b) Hitting the forehand with topspin can make ball's trajectory change compared to hitting the ball with backspin or with no spin. Draw a graph of the expected trajectories of tennis balls hit with topspin, backspin and no spin (assume all other factors contributing to ball trajectory are constant).

(5 marks)

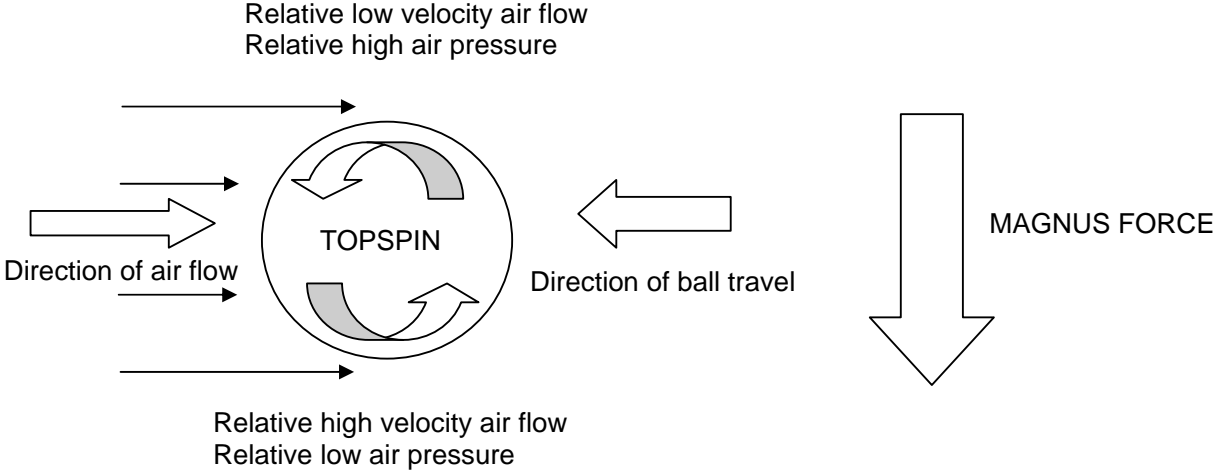
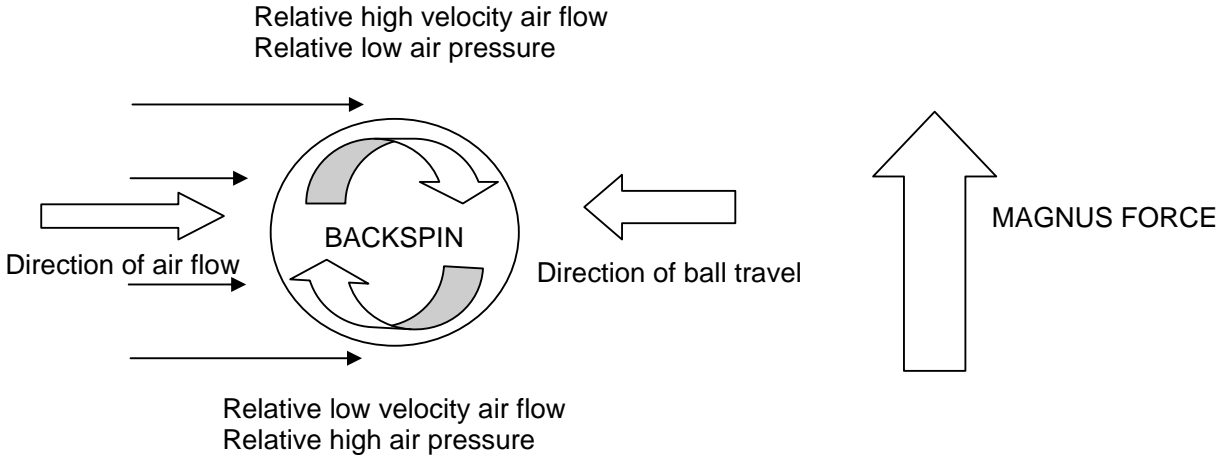
Description	Mark
<i>1 mark for each line (can be drawn on different axes)</i>	3 (1 mark for each line)
<i>Labelling of axes</i>	2



Explain the different trajectories using movement (biomechanical) principles (you may use diagrams to illustrate your response).

(10 marks)

Description	Mark
<i>A backspinning ball will travel through the air with more horizontal displacement than a ball with no spin.</i>	1
<i>The backspinning ball will have relatively high air velocity on top of the ball and low air velocity under the ball</i>	1
<i>The backspinning ball will have relatively low air pressure on top of the ball and high air pressure under the ball</i>	1
<i>The spin results in a Magnus force in an upwards direction that causes the ball to travel further horizontally</i>	1
<i>Further mark for diagram (pictured below) that includes the above points</i>	1
<i>A topspinning ball will travel through the air with less horizontal displacement than a ball with no spin.</i>	1
<i>The topspinning ball will have relatively low air velocity on top of the ball and high air velocity under the ball</i>	1
<i>The topspinning ball will have relatively high air pressure on top of the ball and low air pressure under the ball</i>	1
<i>The spin results in a Magnus force in a downwards direction that causes the ball to drop towards the ground faster than a ball with no spin and less distance horizontally</i>	1
<i>Further mark for diagram (pictured below) that includes the above points</i>	1



SECTION THREE: EXTENDED RESPONSE

Question 4

(20 Marks)

Volleyball is a net-divided team game in which players attempt to score points by hitting the ball into the unguarded spaces of the opponent's court. Players who form the team require a number of key physical variables such as hand-eye coordination, reaction time, anticipation, agility and leg power.

A talented under-17 volleyball player was set a weight-training program designed to focus primarily on **leg power**.

Table 1

Exercise	1 Repetition maximum	Sets	Repetitions	Weight
Squats	90 kg	6	4	87.5 kg
Hamstring curls	27 kg	12	5	18 kg
Calf raises	57.5 kg	5	6	37.5 kg
Leg press	85 kg	4	7	50 kg

- (a) Identify the **two** errors in this program and state the training guideline that should guide the plan for developing muscle power.

Table 1

(3 marks)

Description	Marks
<i>Error 1</i> <i># sets too high in hamstring curl @12 (endurance not power)</i>	1
<i>Error 2</i> <i>Weight for squats is too high @87.5kg (=97% of 1RM) (strength not power)</i>	1
<i>Power training guideline</i> <i>Muscle power requires moderate weights and fast explosive intensity and repetition sets at relatively low number</i> <i>e.g., 2 – 6. i.e. moderate load & low reps</i>	1

The volleyball player followed the initial program shown in Table 1. After five weeks, progressive overload was commenced. The proposed figures for the leg press to be used in week five are shown in Table 2 below.

Table 2

Exercise	Sets	Repetitions	Weight
Leg press	5	10	55kg

SEE NEXT PAGE

- (b) Explain whether the principle of progressive overload has been applied correctly.

(2 marks)

Description	Marks
<i>Incorrect</i>	1
<i>Should maintain the # repetitions but alter the load and sets only for progressive overload muscle power</i>	1

- (c) A likely result of this training program is an increase in the overall size and therefore the strength of the muscle. Two potential mechanisms that could be involved are muscle hypertrophy and muscle hyperplasia. Give a definition of each mechanism and explain to what extent each would be a factor in developing muscle power through the weights program.

(6 marks)

- (i) Muscle hypertrophy

(3 marks)

Description	Marks
<i>Hypertrophy: Increase in size of muscle due to increase in size of individual muscle fibres</i>	1
<i>Resistance training with moderate weights and higher reps than in this program promotes hypertrophy more than endurance activities</i>	1
<i>All muscle fibre types are stimulated in weight training</i>	1

- (ii) Muscle hyperplasia

(3 marks)

Description	Marks
<i>Increase in muscle size due to an increase in numbers of fibres</i>	1
<i>Long term, V high load weight training <u>may</u> stimulate fibre numbers</i>	1
<i>Not a factor in muscle size with this power training program</i>	1

- (d) An analysis of the athlete's movement on court identifies relatively poor agility. The coach decides to include martial arts and running as part of the athlete's agility conditioning program. Discuss how these additional activities improve the player's agility by referring to the following coaching and learning principles.

- (i) Specificity of training

(2 marks)

Description	Marks
<i>Define – the similarity of the training to the demands of the sport.</i>	1
<i>Martial arts training is more specific than running because rapid change of body posture or speeded footwork changing of directions</i>	1

- (ii) Cross training

(2 marks)

Description	Marks
<i>Cross training introduces variety to the athlete's program and allows conditioning of other fitness components</i>	1
<i>Both activities serve this purpose but only martial arts can contribute to agility training; running to aerobic conditioning</i>	1

- (iii) Transfer of training

(2 marks)

Description	Marks
<i>Practicing one skill carries over the learning to another similar skill</i>	1
<i>Martial arts practice requires quick reactions, footwork, body posture changes, balance control. More positive transfer from MA than running</i>	1

- (e) To prepare the team for the upcoming national championships the coach devises simulation drills. Define what is meant by simulation drills and explain why the coach would use simulation drills.

(3 marks)

Description	Marks
<i>Define – Create a practice environment that is close to the 'real' setting</i>	1 mark for each aspect
<i>Create the similar level of distraction, stress and pressure for players to test skills and tactics under pressure</i>	1
<i>To identify potential player weaknesses in focused decision making</i>	1