



PHYSICAL EDUCATION STUDIES

Stage 3

WACE Examination 2010

Final Marking Key

This 'stand alone' version of the WACE Examination 2010 Final Marking Key is provided on an interim basis.

The Standards Guide for this examination will include the examination questions, marking key, question statistics and annotated candidate responses. When the Standards Guide is published, this document will be removed from the website.

Section One: Multiple-choice

15 Marks

Question	Answer
1	a
2	c
3	c
4	c
5	d
6	c
7	c
8	d
9	b
10	c
11	b
12	a
13	c
14	b
15	b

Section Two: Short answer

(45 Marks)

Question 16

(8 marks)



To lift the combined mass of the bar and weights, the athlete shown in the picture above uses strength and power.

- (a) Define Newton's Second Law of Motion and explain it in relation to the acceleration of the bar and its weights. (2 marks)

Description	Marks
Newton's Second Law: $F = ma$ (no mark for formula only) Force acting on a body gives it an acceleration in the direction of the force and is of a magnitude inversely proportional to the mass of the body. (or suitable textbook definition)	1
In relation to acceleration: A body will accelerate with acceleration proportional to the force and inversely proportional to the mass. Or acceleration of the bar will be higher for higher muscle force (directly proportional) [as mass is constant then not applicable to state that acceleration will be lower with the heavier mass of object (inversely proportional to mass)]	1
	Total 2

- (b) The amount of energy exerted by the muscles on the bar and its weights is dependent on three mechanical characteristics of muscle. Explain what these are. (3 marks)

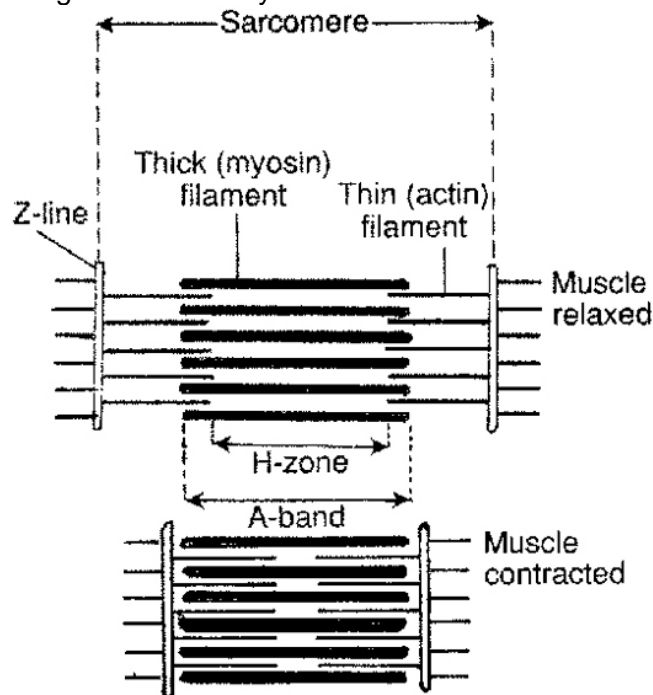
Description	Marks
Increasing velocity of muscle contraction decreases force (concentric/eccentric references acceptable in explanation) Force and velocity – the quicker the muscular contraction the greater velocity of the bar bell upward. The force the muscles provide decreases with the increase velocity of the muscle shortening	1
Length of muscle affects tension Force and length – the length of each muscle used in the raising of the bar varies as to how much tension each muscle can provide, Pre – stretch is a suitable answer on its own So either the comment above or pre – stretch is ok	1

<p>Time to gain maximum force force and time - the greater the force provided in the limited time frame helps accelerate the barbell upward.</p> <p>force time is the time taken for a muscle to generate maximal force – also referred to as electromechanical delay</p>	<p>1</p>
	<p>Total 3</p>

- (c) Use the sliding filament theory to explain how contraction occurs in skeletal muscle.
You may use a diagram as part of your answer. (3 marks)

Description	Marks
<p>Explanation: Myofibrils have several sections know as sarcomeres (1), which are end to end for the length of the muscle. Within each myofibril are two myofilaments – myosin – (a thick filament) and actin – (a thin filament) (1). During muscular contraction, the bunching occurs when myosin glides in between the actin, sarcomere shortens and creating movement (1).</p> <p>If a labelled diagram(s) provided for relaxed and contracted muscle but no explanation then only (1 mark for diagram partly correct; 2 marks for fully correct – do not need H zone; A band labels)</p>	1–3
	Total 3

Exemplar diagram of sliding filament theory.....

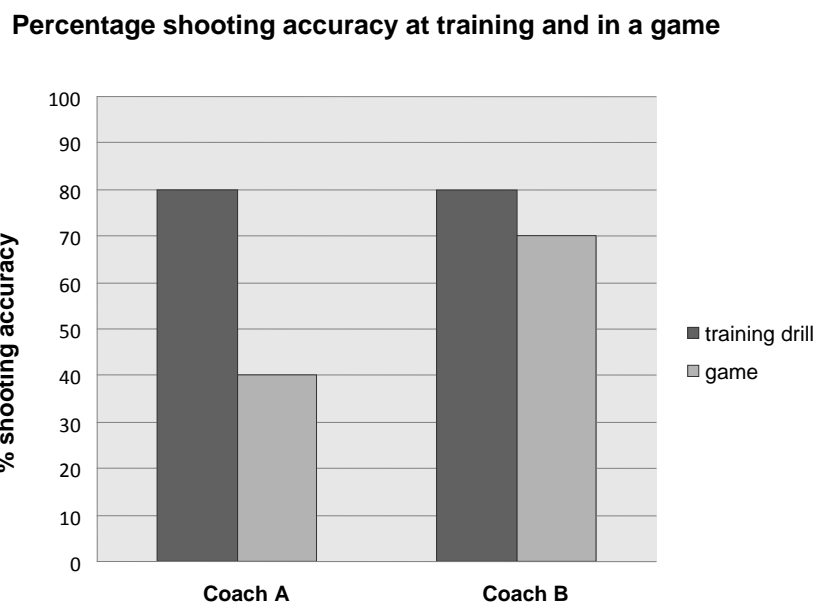


Question 17

(5 marks)

Netball is an invasion game in which shooters try to position for goal shots as close to the post as possible but defenders try to force goal shots from the furthest distance possible. In order to improve the goal-scoring accuracy of their shooters in games, Coach A and Coach B design drills that employ either variable or specific practice at training.

Considering the graph below which shows the performance of A and B's goal shooters in practice and in a game, identify which skill training strategy each coach used and explain why one practice method was superior to the other in producing better shooting accuracy in the game.

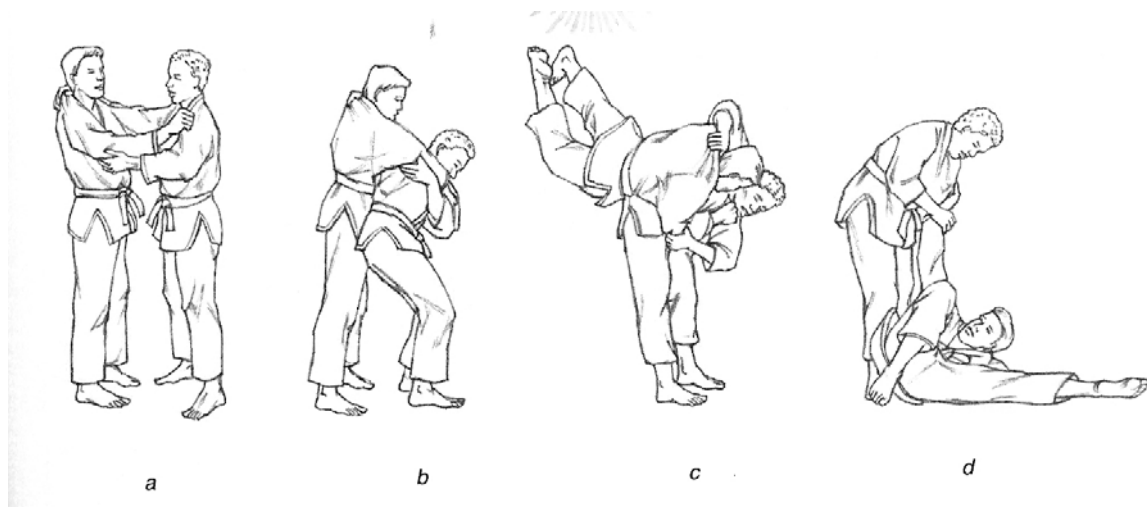


Description	Marks
Coach A used variable practice – a bit of goal shooting, some passing, some other activities for variety Coach B employed drills specific to the game, open & dynamic drills or similar terminology accepted	2 (1 for each strategy)
Why? Coach needs to analyse game requirements (1) i.e., Netball goal shooting is not from the one place Goal shooting requires player to adjust to different distances/ different angles to the goal. (1) Adaptability and flexibility are required; and players need to practice what the game requires – hence specificity to the position (1)	1–3
	Total 5

Question 18

(5 marks)

The pictures below depict a judo hip throw. Describe how the thrower uses the principle of balance to destabilise his opponent and effect the hip throw.



Description	Marks
Thrower shifts the opponent's centre of gravity outside the opponent's supporting base	1
Thrower - wide base of support (widens feet) to increase his stability	1
Thrower - Lowering the centre of gravity (bends at knees and hip) to increase the stability (balance) of the of thrower	1
Pulling the opponent's body forward, the thrower reduces the opponent's stability by moving the line of COG of opponent beyond the edge of his supporting base	1
Extending his legs, the thrower lifts opponent out of contact with the ground and totally destabilises him for the throw	1
Raising COG will destabilise opponent	1
	Total 5

Question 19

(5 marks)

Because of age, niggling recurring injuries and reduced success, Maree is reaching the end of a highly-successful professional swimming career and thinking about how to manage her transition to retirement from sport. She is concerned about losing fitness and gaining weight.

- (a) Using your knowledge of the transtheoretical model of behaviour change, determine the stage Maree is currently demonstrating and outline the key characteristics of this stage.

(2 marks)

Description	Marks
Contemplation - explain the features – considering the pros and cons / thinking about change / potential difficulties (1 mark for name and 1 for explanation)	1–2
	Total 2

- (b) Using specific examples, describe the additional stages Maree would eventually move through to achieve a successful transition to retirement.

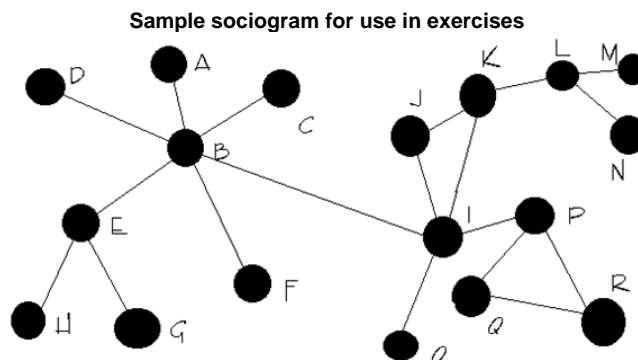
(3 marks)

Description	Marks
1 mark for each description of stage with example. Maximum 3 marks.	
1. Preparation/Planning _stage sets up goals and specific things to do – e.g. maintain weight at retirement level; maintain healthy diet; be active at least 4 times a week for total of 2 hrs per week;	1
2. Action _ announcement and begin new life; select another sport activity to learn something new; join a club, exercise buddy a danger of relapse in this phase etc	1
3. Maintenance _ more than 6 months; a danger of relapse in this phase; niggling injuries stop recurring; eating poorly dropping the healthy lifestyle; have an exercise buddy or social support (and termination (have fully adopted healthy post-career lifestyle) [do not need to add termination – Maintenance is enough]	1
	Total 3

Question 20

(7 marks)

Modern coaches are increasingly interested in leadership within teams and they are aware of research showing that leadership is not merely about appointing the most skilled player as team captain. Consider the sociogram below, which was developed from an analysis of 18 State squad members.



- (a) Explain briefly what this sociogram tells the coach about social leadership status within the squad. (4 marks)

Description	Marks
Any 4 of the points, 1 mark each	1-4
<u>Sociograms</u> provide a picture or diagram of how team members relate to each other, i.e., the social links between them	
Can show mutual choices (people choose each other); one way choice; or sub-grps/cliques (3 or more mutual choices). (1)	
There are two cliques/ subgroups in the squad (1)	
Players B (6 links) and I (5 links) are the most popular players (1)	
Players A, C, D, F, G, H, M, N, O are more individual - link to only one other player (1)	
Players B, E, I, J, K, L, P, Q, R are more connected socially – more connected (1)	Total 4

- (b) Identify **three (3)** criteria to be met by a sociogram analysis developed in a sporting context. (3 marks)

Description	Marks
Any 3 of the points, 1 mark each	1-3
Different criteria in sporting context	
- social relations / friendship strength / cohesion	
- influence	
- the role model (who do the players look up to);	
- the most respected	
- the best communicator;	
- the most friendly ; most supportive	
- formal/informal leaders	
- confidential/ <u>anonymous</u>	
- <u>clearly worded qu's</u>	
- <u>answ truthfully</u>	
- <u>completed in full</u>	
- <u>same vote weighting</u>	Total 3

Question 21

(5 marks)

Adults approaching 50 years of age are encouraged to maintain exercise and a healthy lifestyle to lessen the effects of ageing. Describe **four (4)** physiological changes that may result from a sedentary lifestyle as one ages and for one of the changes, identify a type of physical activity that would alleviate such deterioration in this age group.

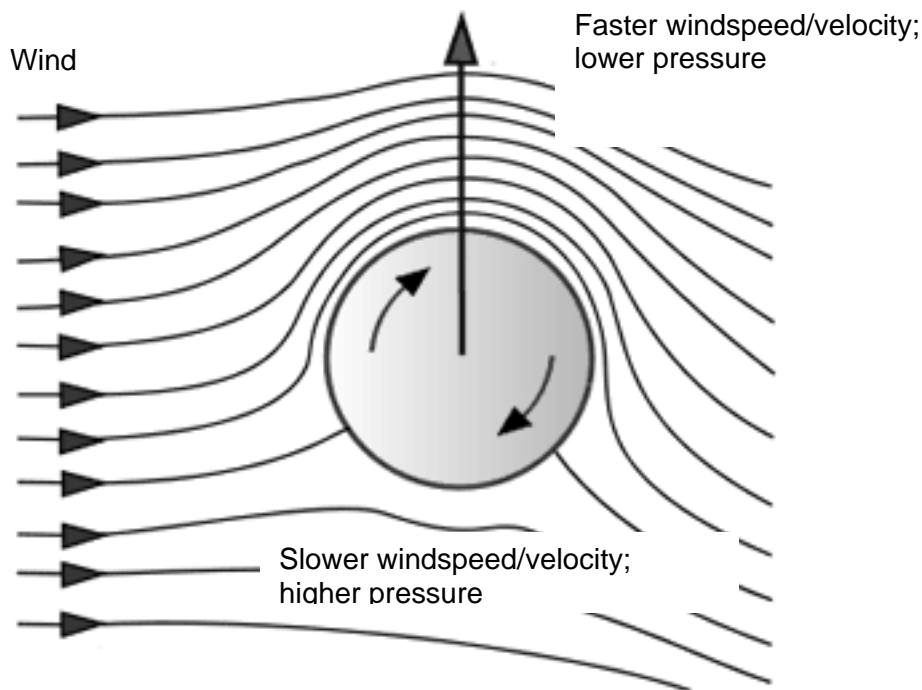
Description		Marks
Identifies one physical activity.	Physical activity	1
1 mark for each of the following changes, maximum 4 marks		
Aerobic capacity / Cardiorespiratory endurance – tissues of the respiratory tract become less elastic and the resting heart rate increases and maximal heart rate will decrease due to cardiac muscle fibres reducing in size. Blood pressure increases due to hardening of arteries. Decreases in stroke volume and maximum heart rate cause a decline in aerobic capacity.	Swimming Cycling Cross trainer Walking Water aerobics Circuit training	1–4
Muscular strength – muscle fibres decrease in size and number causing muscles to become weaker.	Resistance exercises with weights Fit ball	
Muscular Power – slow twitch fibres increase as fast twitch fibre decrease causing the reduction in the ability to produce power.	Resistance exercises with weights Plyometrics but low impact Martial arts	
Flexibility- cartilage shrinks and stiffens causing a reduction in joint flexibility	Yoga Pilates Stretching	
Decreased bone density increasing risk of fractures	Low impact aerobic	
Body composition changes with increases in body fat	Aerobic activities	
Anaerobic capacity – tissues and chemical processes less effective in developing ATP and energy	Short Interval activities	
		Total 5

Question 22

(5 marks)

A ball's flight pathway is affected if it is spinning. Using a labelled diagram to assist, identify and explain the biomechanical principle that causes a deviation in the flight path.

Description	Marks
Diagram: must have arrows of ball spin direction and flow lines of surrounding air	1
High and low pressure zones correctly labelled	1
Ball lift or dip to the low pressure area	1
Magnus effect – Magnus force/effect is named	1
Explanation: Ball deviates to the low pressure side (air displaced around ball moves faster than other side) due to lift from higher pressure (greater friction/drag on that side)	1
	Total 5



Question 23

(5 marks)

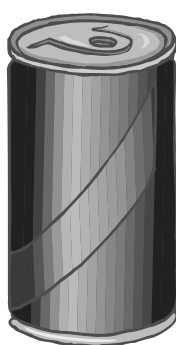
Midfield players at the elite level in sports such as soccer or Australian Rules football often cover many kilometres during a game. Fluid replacement and energy intake during the game are important for optimum performance.

- (a) Considering the relative merits of each drink below, explain which is the least suitable and which is the most suitable as a fluid replacement beverage for midfield players.

(2 marks)



Electrolyte drink



Energy drink



Water

Description	Marks
Electrolyte drink suitable Electrolyte drink more effective as it replaces fluid/electrolytes(sodium and potassium)/energy	1
Energy drink is an energy drink containing high levels of caffeine. Is a diuretic that stimulates loss of fluid increasing dehydration - least suitable	1
	Total 2

- (b) Considering energy depletion during a two-hour game of intense activity, how can these players make the best use of the Glycaemic Index food system to maximise their performance?

(3 marks)

Description	Marks
Description of the Glycaemic Index System Compares carbohydrates according to how quickly they are digested and energy released.	1
High GI Foods are rapidly digested and release glucose into the muscles quickly Or Before the game/warm-up (time reference) Or Best during games lasting more than 60 minutes Or High GI Foods straight after the game to replace energy stores	1
Low GI Foods provide a slow and more sustained release of energy Or Best 1-4 hours before the event Or After the game Low GI foods as the main meal to replace energy stores and be able to train optimally during the week in preparation for the next game.	1
	Total 3

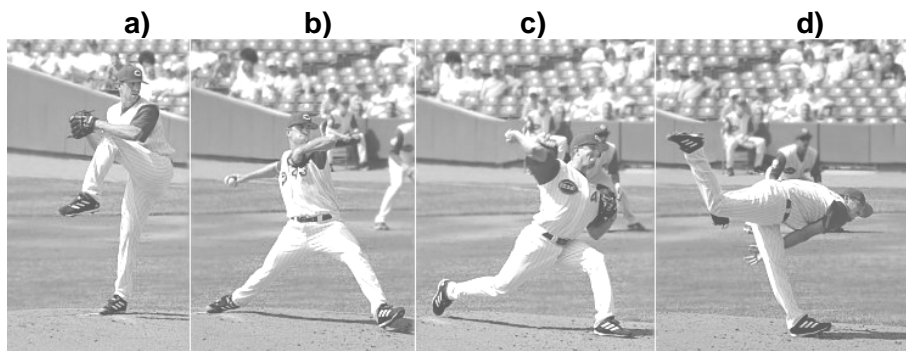
Section Three: Extended answer

(40 Marks)

Question 24

(20 marks)

An integral aspect of a training program is the analysis of skills and the selection of appropriate skill improvement strategies. Consider the images of a baseball pitch (overarm throw) shown below.



- (a) With examples related to throwing, outline the key tasks in qualitative analysis that a pitching coach should undertake to evaluate this throwing action. (8 marks)

Description	Marks
1 for naming and outlining each stage 1 mark for application of each stage to throw	
1. Preparation/Pre Observation; here the coach is concerned with the process of developing a prerequisite knowledge base (1) about pitching/throwing - the particular movement features; criteria for successful performance e.g. Sequential motion (not simultaneous); Goal of the pitch/throw – accuracy and speed; difficult ball to hit, strike out, tactical advantage (1) checklist of variables teaching points prep/exec/follow through	1–2
2. Observation; this involves systematically gathering appropriate information about the performance of the pitching skill; optimal observation position Lab/training/game play context of analysis Video methodology	1–2
3. Evaluation/ diagnosis; this involves the identification of the desirable (strengths) and undesirable (weaknesses) aspects of the movement, as well as the identification of possible ways of improving the performance (interventions)	1–2
4. Intervention/Remediation; this involves providing feedback (e.g. show errors by video of self or elite pitcher) and corrections, usually under practice conditions, that will lead to improved performance, demo's of elite pitcher	1-2
	Total 8

- (b) Explain **three (3)** biomechanical principles the baseball pitcher is applying to produce maximum velocity on the ball and discuss how balance, speed, strength or flexibility interact with these principles to improve the pitcher's throw. (12 marks)

Description	Marks
<p>For each of the principles (3 of 10 below) :4 marks for each principle; Maximum 12 marks.</p>	
<p>1 mark for identifying a principle;</p>	<p>1</p>
<p>2 marks for explaining principle; - 0 = incorrect explanation; 1 = basic description; 2 = in-depth, correct explanation & directly related to the pitch/throw</p>	<p>2</p>
<p>1 mark for integrating the appropriate skill improvement strategy (i.e., B, S, S, F) with the principle. Overarching Principles /concepts as per the stage 3 syllabus. Student expected to address three different principles rather than three elements that are listed within a principle</p>	<p>1</p>
<p>Principle of Segmental Interaction / kinematic chaining : kinematic chain or summation of velocity; corrections in body positioning & timing</p> <p>1. Sequentially accelerate each body part - Each subsequent segment should begin to move as the preceding segments reaches its maximal velocity to ensure optimum momentum is transferred onto the ball. Important to sequentially stabilise each segment so that the next segment accelerates around a stable base to transfer momentum</p> <p>OR</p> <p>2. Sequential movement of the body parts from the largest and strongest segments through to the smallest and fastest. e.g., The stronger and larger muscles of the legs, thighs and hips and trunk are moved first in the pitcher's throw followed by the smaller and faster muscles of the shoulders, arms and wrist to ensure optimum momentum is passed onto the ball at the point of release.</p> <p>Or</p> <p>3. Maximise lever length at point of release - Angular velocity is greatest at the distal end of a lever, therefore maximizing the length of the lever at the point of release ensures the ball travels with maximal velocity when it leaves the hand (follow through towards target)</p> <p>Skill and strength – the ability of the muscles to exert the force against the ball - Strength Training or</p> <p>Skill and flexibility – the ability of the pitcher to move through the full range of motion required for pitching - Flexibility and Strength relationship</p>	

4. Principle of Force – time (Impulse) the greater the force and the longer the force is applied to the ball the greater the impulse. By adopting a side on throwing position and extending the throwing arm back during the preparation phase, it allows for maximum distance and time for the summation of momentum, as force can be applied over the maximum possible time. The pitcher applies greater impulse by leaning back in preparation and releasing the ball far out in front of his supporting leg

And ?or

5. Principle of Force – length (Stretch shortening cycle) - A stretch-shortening cycle is defined as a stretch (eccentric contraction) of a muscle followed by an immediate shortening (concentric contraction) of that same muscle. e.g by placing the muscles of the arm and chest on pre stretch (eccentric contraction), it acts to store elastic energy which is then released during a powerful concentric contraction. This ensures maximum velocity of the throwing arm is achieved

And/ OR

6. Maximise the number of segments: Incorporating a number of body parts into the pitcher's throw action allows maximum time and distance for the summation of momentum, because force can be applied over the maximum possible time. Achieved by adopting side on position to target to ensure legs, hips, shoulders etc are used in execution of the throw. This allows for the force to be applied over a longer period of time, therefore creating a bigger impulse. Follow through towards the target ensures safe dissipation of force and ensures no deceleration of final segment at point of release.

And / OR

7. Newton's 2nd law of motion $F=ma$

Define and explain that the size of the objects (ball) rate of change of acceleration is proportional to the force applied to it. Therefore the greater the force applied to the ball, the greater rate of acceleration and the further it will travel

<p>Skill and speed - perform the skill quickly providing maximum impulse on the ball. Speed Training or</p> <p>Skill and strength – the ability of the muscles to exert the force against the ball - strength Training</p>	
<p>8. Principle of Balance</p> <p>Ensure you have a large stable base to ensure all segments rotate around a stable base. This can be achieved by taking a large step towards the target.</p> <p>When one body part moves away from the line of gravity another moves to compensate for it and therefore maintain balance – right leg lifted up after follow through with the throwing arm. Follow through towards the target with the throwing arm to ensure there is no deceleration of the arm before the ball is released</p> <p>Skill and balance – maintain the pitcher’s body equilibrium through the whole movement (dynamic). Core stability training; width of stance and lower CoG</p>	
<p>9. Principle of Torque (Angular Motion)</p> <p>The contribution of rotation to the linear velocity of the ball is dependent on the rate of rotation and the distance of the ball from the axis of rotation (the length of pitcher arm is fixed). Maximise angular velocity at the commencement of the throw.</p> <p>Reduce the arm’s moment of inertia at the commencement of the throw by bringing the ball close to the axis of rotation (the shoulder) hence allowing the arm to increase its angular velocity. Flattening the arc during the throw.</p> <p>Skill and speed - perform the skill quickly providing maximum impulse on the ball. Speed Training or</p> <p>Skill and strength – the ability of the muscles to exert the force against the ball - strength Training</p>	
<p>10. Newton’s 3rd law of motion – reactive force</p> <p>By creating a larger ground reaction force, you get a greater equal and opposite reactional force allowing for greater development of momentum towards the target.</p> <p>Maximise Ground Reaction Force – if the pitcher increases the GRF that he applies, the ground will “push” harder against the pitcher’s feet and his</p>	

<p>performance should improve. The large muscles extending thigh & knee & ankle joints are more effective in generating the desired GRF than small muscles.</p> <p>nd strength</p>	
	Total 12

Note: Principle of Spin not appropriate to this question – relates to ball pathway and not to imparting velocity on the ball.
Principle of Projectile motion in (2AB syllabus) not appropriate to this question – relates to ball trajectory/pathway and not to imparting velocity on the ball at release.

Question 25

(20 marks)

For his general fitness, Bob (a 40-year-old) usually swims twice a week for 45 minutes. In six months' time he aims to compete in a State veterans 20 km cross-country running event of about two hours' duration. The run is to be over hilly terrain with uneven tracks. Although he has reasonable cardiovascular fitness, he has not done much weight-bearing exercise over the past 10 years and is 15 kg over his optimum weight. He is seeking advice on how to set up a holistic training regime that develops his fitness and motor skills for the run. He is cautious about starting 'too hard, too soon'.

Based on motor learning and physiological training principles:

- (a) analyse Bob's current skill and fitness capacities
- (b) contrast these with what he will need for the cross-country event
- (c) address the implications of being cautious in his training regime
- (d) outline short-term and long-term holistic goals that address at least two areas of his training
- (e) suggest strategies that he could use to self-monitor his improvement and self-correct his performance.

Description	Marks
Content – addresses these 5 key aspects; 4 marks per aspect	
4 = 4 or more elements at least 2 elements for skill and 3 for fitness	4
3 = 3 elements – at least one for skill or fitness	3
2 = 2 elements – one from skill; one from fitness	2
1 = 1 element from either skill or fitness	1
0 = does not address current skill or fitness level	0
(a) Addresses current skill level and fitness Skill: Swimming has developed flexibility e.g., shoulder and ankle joints - too flexible; ligaments and muscles need to be stronger/tighter Equilibrium/form/body position– swimming promotes balance in horizontal Different motor skills required for leaping and agility to jump obstacles on path; co-contraction of muscles around ankles and knees for added stability Coordination/timing of body parts Fitness: Aerobic fitness moderate (only 2 times a week) – needed for greater aerobic endurance Strength lower limb muscles not sufficient for weight bearing Overweight 15kg – points to dietary analysis to identify changes in eating patterns for weight loss – healthy balanced diet; volume and timing eating; balancing carbs, protein and fats	
4 = 4 or more elements contrasted	4
3 = 3 elements contrasted	3
2 = 2 elements	2
1 = 1 element contrasted	1
0 = omits to contrast differences	0

Description	Marks
<p>(b) Contrasts skill and fitness differences between swimming and X-country running –</p> <ul style="list-style-type: none"> a. weight supported vs weight bearing, b. uneven surfaces, leaping and agility to avoid objects on path, need to work on balance to adjust for unstable surfaces c. emphasis on lower limb in X-country running; arm work in swimming - different coordination required d. overweight - adverse effect on endurance fitness in weight bearing activity of running e. may explain the principle of training specificity 	
4 = 2 risks plus must include both progression and specificity principles in relation to managing the risks	4
3 = 2 risks described plus includes at least one of the training principles (progression or specificity)	3
2 = 2 risks described	2
1 = 1 risk described	1
0 = omits to address this aspect differences	0
<p>(c) Why caution in training routine: Potential /risk of acute injury e.g. pulled hamstring, ankle sprains, Achilles tendon tear - quads muscles/ knee/ ankle soreness, blisters</p> <p>Currently overweight – additional stress on lower limb and CV system (maybe higher BP) – need to exercise and change diet to reduce weight</p> <p>Training principle of overtraining - need to start at an easy load and slowly build up - elaborate microcycles in training within 6 month macrocycle</p> <p>Specificity principle – build fitness and skills in relation to the type of event (from track running to over rough ground);</p> <p>Nutrition - managing carbohydrate intake and hydration for endurance event</p>	
4 = addresses both a ST and LT goals for two areas of training with examples specific to the 6 month 'season'	4
3 = uses features of goals to elaborate ST and LT goal but for only one area of his training.	3
2 = uses features to frame either a ST or LT goal relevant to Bob	2
1 = identifies features of goals setting only (M,M,S,T)	1
0 = not addressed	0
<p>(d) Goals setting for this scenario – meaningful, specific, time frame and measurable – (that includes frequency, type and time aspects in training). SMARTER / SSCAMP</p> <p>Examples to address at least two aspects and be specific to this scenario</p> <p>ST goal – to begin brisk walking on level, then on hills in suburbs; frequency - up an down hills 4 sessions a week; (aim to lose 2 kg/month)</p> <p>LT goal – to complete the race in under 2 hours; weight to be 10kg lighter</p>	
4 = 4 or more elements named with an example of each to demonstrate their use by Bob	4
3 = 3 elements – elaborate on at least 2	3
2 = 2 elaborate at least one	2
1 = 1 element mentioned but no elaboration	1
0 = not addressed address this aspect	0

Description	Marks
(e) Self monitor/ self-correction strategies described Journal training diary food diary to monitor diet video of running technique performance in trial or lead up events electronic aids (h/r monitor, GPS)	
	Total 20

Question 26

(20 marks)

Consider elite sports teams that train and compete outdoors in hot/dry conditions, as opposed to teams that train and compete in extremely cold/wet conditions. The impact of environmental conditions needs to be considered by a coach in designing the physical and mental training program for a whole season (for weekly fixtures plus finals) to ensure players are performing at their peak for the whole season.

In reference to **five (5)** key training principles, explain and justify any adaptations to the physical and mental program that should be made because of these contrasting environmental conditions. Elaborate your answer with specific examples.

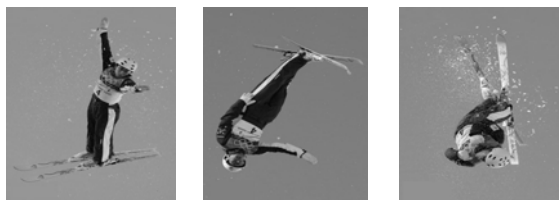
Description - select 4 training principles		Marks
Naming		1
Explaining the principle		1
Contrast with hot vs cold (physical and/or mental reference)		2
Training Principles	<p>a) Physical training - Adaptation to hot v cold</p> <p>1 mark for describing the training principle</p> <p>1 mark for correctly describing a correct adaptation</p>	<p>b) Mental Skills – integrated within the training principles</p> <p>1 mark for linking training principle with mental skill training application.</p> <p>1 mark for an application</p>
<p>1. Periodisation and phases</p> <p>Planning the program to peak at the right time for weekly matches and then for finals</p>	<p>Use of micro and macro cycles the same although the specifics can be different (i.e. weekly micro cycle; still have macro cycles (early season; round 1; round 2; round 3;) same phases (pre-season, in season, finals, off-season)</p> <p>Acclimatisation can be longer for cold conditions.</p>	<p>Goal setting and developing the right attitude and motivation levels pre-season, in season and for finals</p> <p>Cycles help avoid overtraining and burnout</p> <p>Allocating rest and recovery periods</p> <p>e.g., for Self confidence</p> <p>Motivation</p> <p>Relaxation and enjoyment</p>
<p>2 . Peaking and</p>	<p>No differences for either in applying this principle – gives reasons why</p> <p>e.g. in spite of conditions teams must be brought to peak condition (physical and mental for finals)</p>	<p>Players are mentally fresh and reach ideal performance state; allowing players to perform at their optimum or “in the zone”</p> <p>e.g., Players in control and respond automatically to game situations.</p>
<p>tapering for the finals</p>	<p>e.g. in spite of conditions, training must taper to allow peak energy /recovery leading into finals in which the physical effort and mental aspects are the most intense.</p>	<p>e.g., Highly energised positive reaction to game cues and strategies</p> <p>Mental alertness and focus in control</p>
<p>3. Recovery</p>	<p>Differences – gives reasons why</p> <p>e.g.</p> <p>Longer for hot / hydration is critical</p> <p>Different recovery activities – ice baths / cool down vs warm up/get dry</p>	<p>Emotional Recovery and contingency plan after unexpected loss or poor performance.</p> <p>Enable player to return to normal mental state and ready for next performance</p>

Description - select 4 training principles		Marks
Naming		1
Explaining the principle		1
Contrast with hot vs cold (physical and/or mental reference)		2
		Effective recovery will enable player to perform optimally with the same characteristics mentioned in the other principles. e.g. Staying mentally fresh stress management and concentration skills Optimal arousal levels
4. Overtraining - injury prevention - fatigue	Differences – gives reasons why Time of training - in cooler hrs for hot Hydration breaks – more frequent for hot than cold Longer rest breaks for hot Heat stress/ hyperthermia (cool and loose clothing, ice vests; fans; sun protection) vs hypothermia injury (skins clothing; water repellent clothing) Outdoor vs indoor venues and protection from the elements Playing surfaces and equipment – slippery, waterlogged	Imbalance between training, performance and recovery leading to loss of motivation and enthusiasm, poor concentration and decision making during games, moodiness, easily irritated, poor sleep patterns and often feeling depressed. Prevention will enable to player to perform optimally e.g., prevention by adding variety and cross training sessions, monitor training load(volume and intensity), keeping a training journal , testing and questionnaires and watching for symptoms
5. Training load - frequency - intensity - duration	Differences in Warm up – longer for cold Frequency – no difference – gives why Intensity – less intense with heat, more intense with cold Duration of training sessions – shorter with heat; longer with cold	Practising mental skills strategies as supplement to physical training e.g. variety of strategies and training application may include: Debriefing to express thoughts and feelings Meditation Relaxation techniques Progressive muscle relaxation Imagery/visualisation Breathing techniques Flotation tanks Music to calm and relax Team outing or social event
6. Progression / overload training	No differences - both environmental conditions require progression in training and overload to prepare athletes towards finals - coach needs to ensure athletes peak and have sufficient recovery	Practising mental skills in game scenarios and pressure conditions e.g. speed decisions; complex decisions
7. Specificity /type	No differences – gives reasons why Needs to be closely related to game requirements despite each environmental condition	Game scenarios and conditions included at training Development of specific skills such as visualisation and pre-performance routines to enhance performance
		Total 20

Question 27

(20 marks)

The photos below show Australian aerial skier Lydia Lassila performing her gold medal-winning jump in the Freestyle Aerial ski event at the 2010 Winter Olympic Games. This event is often referred to as ‘diving on skis’. It requires athletes to ski down a slope, take off into the air, perform multiple acrobatic manoeuvres (rotating and twisting movements) and then finish with a safe landing. Athletes are judged on the quality of the take-off, the height and distance of the jump, the form and body position in flight, and the landing.



Lydia was competing this year after coming back from two knee reconstructions. She had injured her knees in the same event four years earlier. She has stated that her success was all about ‘mental toughness and control and going into autopilot while in the air’.

- (a) Define **four (4)** different mental strategies Lydia may have used during the Olympic competition period to enable her to achieve a gold medal-winning performance. Discuss an application to the event for each of these four strategies. (12 marks)

Description	Marks
Four strategies required- Answers must relate to the competition itself 3 marks awarded for each strategy;	
1 mark name of strategy,	1
1 mark for definition,	1
1 mark for application to this event.	1
1. Goal Setting – define: setting goals/objectives that are within the SMARTER or SCCAMP approaches / or Types of Goals (Outcome, Performance and Process). Application: must relate to the specific performance e.g. focus on immediate goal of this run and not worry about the next run e.g. “aiming to get a score a personal best in this next jump”; e.g. I want to improve my score by 10% for the final to be a medal chance”	
2. Performance routines – definition: a sequence of actions that set the athlete’s focus for the performance or similar Application: e.g. doing the same thing at the start line/ start gate such as taking 3 deep breaths, shrugging the shoulders and counting to five before push off. Or similar	
3. Imagery or visualisation – definition: mental picture of her performing the skill. Application: e.g. picturing herself flawlessly completing the twists; picturing her smooth sequence of arm movements ; visual self-affirmation- picturing herself on victory dais or similar	
4. Self Talk – definition – verbal positive, self-affirmation statements or statements to re-focus or confidence booster statement e.g. “ I am capable of doing the best jump ever “ or similar	
5. Relaxation (a) definition: releasing feelings of tension and anxiety of rapid shallow breathing rapid HR; Application: focus on breathing techniques; or (b) progressive muscle relaxation – definition: series of exercise to tense and relax muscle groups e.g. she might lie on the ground and relax from feet to head, or similar or (c) Meditation (accepted but not in syllabus elaboration)	
Total	12 Marks

- (b) Freestyle Aerial skiing requires skills to be performed in a layout position (that is, no tucking of legs) with rotating and twisting movements on three different axes (see photos). Discuss the major biomechanical principles that apply during flight for the successful performance of aerial skills such as these. (8 marks)

Description	Marks
Any combination of up to 8 marks	
	1
	1
	1
	1
	1
3. Description of moment of inertia - maintaining or resistance to rotational or angular motion	1
4. Relates to Newtons First Law (Law of Inertia) and has 2 components with mass and the distance mass is distributed away from axis of rotation. Body shape and position changes which changes inertia and velocity	1
5. Applies changes in moment of inertia ; changing body shape - tuck in arms by side of body to shorten radius and spin faster on the vertical axis.	1
6. Fluid dynamics or air resistance or drag.	1
Problems with skis and clothing slowing rotation (rotational inertia)	1
	Total 8
Conservation angular momentum	
Dist. Of mass around COG	

ACKNOWLEDGEMENTS

Section Two: Short Answer

- Question 16** (n.d.). Weightlifters performing a dead lift [Photograph]. Retrieved April, 2010, from http://www.mensfitness.com/fitness/beginner_weight_training/307
- Question 18** Carr, G. A. (2004). *Sport Mechanics for Coaches* (2nd ed.). HumanChampaign, IL.: Kinetics, p. 201.
- Question 20** Sociogram diagram. (2005). [Image] <http://www.sims.monash.edu.au/subjects/ims5023/files/week12/Week12-2005.htm>

Section Three: Extended Answer

- Question 24** Dikeman, R. (2004). Baseball pitching motion [Photograph]. Retrieved April, 2010, from http://commons.wikimedia.org/wiki/File:Baseball_pitching_motion_2004.jpg
- Question 27** Spencer, C. (2010). Arial skier (a) [Photograph]. Retrieved April, 2010, from <http://www.life.com/image/96901954>
- Spencer, C. (2010). Arial skier (b) [Photograph]. Retrieved April, 2010, <http://www.life.com/image/96901063>
- Spencer, C. (2010). Arial skier (c) [Photograph]. Retrieved April, 2010, <http://www.life.com/image/96901004>