

Physical Education

Advanced Subsidiary GCE

Unit **G453**: Principles and concepts across different areas of Physical Education

Mark Scheme for January 2011

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Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

Question Number	Expected Answer	Marks
Section A – Historical Studies (Option A1)		
(a)	<p>The 1933 Syllabus for Physical Training was followed in the 1950s by <i>Moving and Growing</i> and <i>Planning the Programme</i>.</p> <p>Compare the teaching methodology of the 1933 and the 1950s approaches and give reasons why the 1950s approach was introduced.</p> <p>5 marks for 5 of: sub max 3 for either part of question</p>	
Compare the teaching methodology of the 1933 and the 1950s approach (sub max 3)		
	1933	1950s
1	Mainly centralised/teacher direction/limited or no individual interpretation of tasks/command style	Mainly decentralised/child-centred/teacher guidance rather than direction/individual interpretation of tasks
2	Group work/co-operative	Group work/co-operative/problem solving/creativity/exploration/discovery
3	5x20 minute/more lessons per week (recommended)	Weekly lessons (recommended)
4	In playground/outdoors (recommended)/some specialist gymnasia/limited or some specialist equipment or minor apparatus (eg balls, mats)	Many newly built gymnasia/(more) specialist apparatus (eg ropes, bars, boxes, etc) <i>BOD – gymnasia in 1950s but not in 1933</i>
5	(Some) specialist (PE) teachers/untrained	(More) specialist (PE) teachers <i>BOD – specialist (PE) teachers in 1950s but not in 1933</i>
6	Special kit	Special kit
Give reasons why the 1950s approach was introduced (sub max 3)		
7	Need for 'thinking' soldiers (in WW2) (lead to perceived) need for 'thinking' children	
8	New apparatus design (influenced by army assault courses which lead to new innovative teaching)/new purpose-built gymnasia/post war building programme lead to building of more specialist facilities	
9	More female PE teachers (who encouraged a 'movement' style of PE)/(Modern Educational) Dance influenced the creative or movement approach/music and movement	
10	A (more) holistic approach in PE (thought to be) needed/social or personal or cognitive or intellectual or emotional development (plus physical development encouraged or (considered) important)/evacuation of children from cities to countryside in WWII gave space and freedom for play activities	
11	More modern methods (encouraged)/(more) creativity needed/(prescriptive) tables discouraged/innovative teaching	

Question Number	Expected Answer	Marks
(b)	<p>Explain social and cultural factors that influenced the nature of mob football in pre-industrial Britain. Explain the impact of improved transport on the development of association football as a rational game between 1850 and 1900.</p> <p>5 marks for 5 of: sub max 3 for first part of question – must link the social/cultural factor to the nature/identify characteristic to gain each mark sub max 2 for impact of improved transport</p>	
	Nature/characteristic of mob football	Influential social/cultural factor (sub max 3)
1	Local	Limited transport or communications
2	Simple unwritten rules	(widespread) illiteracy
3	Violent	Nature of society (which was hard/violent)/harsh conditions
4	Occasional	Links with Holy days or holidays or feast days eg Shrove Tuesday, New Year etc/due to seasonal time Do not accept – lack of time on own
5	Popular/lower class	Two class society/feudal system
6	Rural	Before migration to towns/before industrial revolution
7	Wagering	Chance of going from rags to riches/to add excitement/chance to show status or wealth
8	Simple/natural	No purpose built facilities
	Explain the impact of improved transport on the development of association football as a rational game between 1850 and 1900. (Sub max 2)	
9	(assessment of impact) (significant)	(Improved transport) had a significant impact on the development of association football
10	(evidence) (travel)	(Improved transport) <ul style="list-style-type: none"> enabled teams to travel further (in a shorter time)
11	(afford)	<ul style="list-style-type: none"> ...at an affordable cost
12	(rules)	<ul style="list-style-type: none"> ...impacted on the standardisation of rules/codified
13	(supporters)	<ul style="list-style-type: none"> ...enabled supporters to travel (with their teams)
14	(competitions)	<ul style="list-style-type: none"> ...stimulated the development of football leagues, cups and/or competitions/international competitions

Question Number	Expected Answer	Marks
(c)	<p>Define athleticism and explain the expansion of sports and games during stage three. Describe <u>one</u> way in which the physical activity of young people in schools today is still influenced by the public schools of the nineteenth century.</p> <p>5 marks for 5 of: sub max 1 for definition of athleticism sub max 3 for explanation of expansion of sport and games in stage three sub max 1 for influence today</p>	
Definition of athleticism (sub max 1)		
1	Physical endeavour and moral integrity/ trying hard and playing fair/ effort with sportsmanship/	
...explain the expansion of sports and games during stage three (sub max 3)		
2	(character)	Games (thought) to develop character and so encouraged/values or benefits were linked with games playing and so encouraged/helps with social control
3	(melting pot)	Oxbridge or the universities became a 'melting pot' for games (so they grew during this stage in schools)/different games were taken to Oxbridge where they mixed and became standardised version of game/s
4	(rules)	Rules were established which encouraged their expansion/games became more organised or structured or regulated
5	(Oxbridge graduates)	Games-playing Oxbridge graduates were employed (as assistant masters) and they encouraged games
6	(impact on society)	Ex-public schoolboys spread (team) games or rational recreations (throughout the world)/as ... teachers/army officers/parents/priests/vicars/industrialists/community members and leaders... Ex-public schoolboys helped to spread team games
7	(girls)	Girls schools were slower to adopt games
8	(facilities)	Expansion of facilities helped to expand team games
9	(time)	Large amounts of time devoted to team games/games often compulsory each day/games afternoons/inter-school/inter-house
10	(status)	Games at (very) high status so expanded/sports days reinforced importance
11	(coaching)	Coaching helped (either from professionals or assistant masters)

Describe <u>one</u> way in which the physical activity of young people in schools today is still influenced by the public schools of the nineteenth century. (sub max 1) accept first attempt only	
12 (inter-house)	Inter-house sports and games played in (some) schools today/inter-school/sports days/exclusive public school competitions
13 (games)	(in some schools) games and PE separate on curriculum (which affects the physical activity experience)/games have high status in (some) schools (as in nineteenth century)
14 (values)	PE or games thought (by many) to encourage (variety of) values or benefits today (and so important curriculum)/leadership or loyalty or other values thought to be engendered by games playing today/social control
15 (prestige)	Success in games considered a selling point for or in (some) schools (today – and so important on curriculum)
16 (responsibility)	Experience of games playing or holding position of responsibility (eg captain of First Team) notable today (eg included on references or Personal statements etc)
17 (staff)	Oxbridge 'blues' or those with national or high playing honours are employed (in some schools) today for kudos they add to school or for their sporting prowess or name (with subsequent impact on young people)

Question Number	Expected Answer	Marks
(d)	<p>Discuss athletics as a pre-industrial popular recreation and as a post-industrial rational recreation. Include a critical evaluation of the effect of social class on participation in popular and rational athletic events and on participation and performance in athletics today.</p> <p><u>Level 4: – a comprehensive answer</u></p> <ul style="list-style-type: none"> • detailed knowledge & excellent understanding • detailed analysis and excellent critical evaluation • well-argued, independent opinion and judgements which are well supported by relevant practical examples • very accurate use of technical and specialist vocabulary • high standard of written communication throughout. <p>Discriminators from L3 are likely to include:</p> <ul style="list-style-type: none"> • all aspects of question are likely to have been addressed – pre-industrial (community events + pedestrianism + evaluation of class)/rational (including growth of urban athletics events + evaluation of class)/evaluation of class on participation and performance in athletics today • high quality discussion • sound structure and balance between parts of question • an insightful understanding of the impact of social class on participation and/or performance in athletic events through time. <p><u>Level 3: – a competent answer</u></p> <ul style="list-style-type: none"> • good knowledge & clear understanding • good analysis and critical evaluation • Independent opinions and judgements will be present but may not always be supported by relevant practical examples • generally accurate use of technical and specialist vocabulary • written communication is generally fluent with few errors. <p>Discriminators from L2 are likely to include:</p> <ul style="list-style-type: none"> • most aspects of question are likely to have been addressed – pre-industrial (community events + pedestrianism + evaluation of class)/rational (including evaluation of class)/evaluation of class on participation or performance in athletics today • good level of discussion • an attempt at answering the question with balance • a clear understanding of the impact of social class on participation and/or performance in athletic events through time. <p><u>Level 2: – a limited answer</u></p> <ul style="list-style-type: none"> • limited knowledge & understanding • some evidence of analysis and critical evaluation • opinion and judgement given but often unsupported by relevant practical examples • technical and specialist vocabulary used with limited success • written communication lacks fluency and contains errors. 	<p>[18–20]</p> <p>[13–17]</p> <p>[8–12]</p>

Question Number	Expected Answer	Marks
	<p>Discriminators from L1 are likely to include:</p> <ul style="list-style-type: none"> • an attempt has been made to cover all three aspects of the question (pre-ind/rational/today) • some attempt at discussion • Improved structure/balance • understanding of the impact of social class on participation and/or performance in athletic events through time. <p><u>Level 1: – a basic answer</u></p> <ul style="list-style-type: none"> • basic knowledge & little understanding • little relevant analysis or critical evaluation • little or no attempt to give opinion or judgement • little or no attempt to use technical and specialist vocabulary • errors in written communication will be intrusive. 	[0-7]

Indicative content: candidate responses are likely to include (relevant responses not listed should be acknowledged)

Athletics as a pre-industrial popular recreation – early athletics		
Community events		
1	Festivals	<ul style="list-style-type: none"> community events/rural sports/folk sports/festivals/(village) fairs/(church) wakes/parish events/(all with 'athletic' events) eg Dover Games/Cotswold Games/Much Wenlock Olympian Games/Hungerford Revels/other suitable example 'athletic' events including: stick fighting/smock races/wrestling/running/catching greasy pig/whistling matches/grinning contests/climbing the greasy pole/jousting or other suitable example
2	Prizes	Prizes awarded <ul style="list-style-type: none"> eg food, clothes, money
3	Church involvement/resistance	wakes originated from Paganism/wakes were annual religious celebrations/harvest thanksgiving/celebration of Christianity in community/church against the excesses associated with some events
4	Class involvement	<ul style="list-style-type: none"> predominantly lower class (some) upper class patronage or support
Characteristics of popular recreation – links to community events		
5	Violence/corruption	<ul style="list-style-type: none"> Not generally common some evidence of prize fighting or cruelty against animals
6	Rules	<ul style="list-style-type: none"> Yes – simple and unwritten rules
7	Local	<ul style="list-style-type: none"> Yes – local events/people from neighbouring villages would walk or travel to join in
8	Occasional	<ul style="list-style-type: none"> Yes – often annual eg Easter Monday
9	Rural	<ul style="list-style-type: none"> Yes – as Britain was predominantly a rural society
10	Wagering	<ul style="list-style-type: none"> Yes – on many attractions eg races and games
Pedestrianism		
11	Footmen/pedestrians	<ul style="list-style-type: none"> footmen employed as messengers or as competitive runners/occupational arising because simple/natural
12	Class-gentry	<ul style="list-style-type: none"> gentry patrons (looked after lower class runners) gentry or upper class competed to test themselves
13	Patronage	<ul style="list-style-type: none"> patrons set up races provided 'purses'/were promoters or sponsors
14	Festival occasions	<ul style="list-style-type: none"> spectator attractions highly organised or structured
15	Examples	<ul style="list-style-type: none"> Robert Barclay Allardice Deerfoot (Native American) or other suitable example/1000 miles in 1000 hrs/hopping races around Hyde Park or other suitable example
16	Rewards	<ul style="list-style-type: none"> prize money or fame or status for winners rags to riches opportunity
17	Linked attractions	<ul style="list-style-type: none"> horse racing prize (bare-fist) fighting

Characteristics of popular recreation – links to pedestrianism		
18	Violence/corruption	<ul style="list-style-type: none"> cheating common/match fixing/violence among crowd/pedestrianism gained bad reputation
19	Rules	<ul style="list-style-type: none"> rules established by organisers/more organised than most other popular recreations
20	Local	<ul style="list-style-type: none"> Yes – due to limited transport & communications
21	Occasional	<ul style="list-style-type: none"> Yes – often annual
22	Rural	<ul style="list-style-type: none"> Yes mainly – though some events in towns and cities
23	Wagering	<ul style="list-style-type: none"> Yes – popular gambling attraction
Athletics as a post industrial rational recreation		
24	Industrialisation	<ul style="list-style-type: none"> Lead to end of rural fairs Urban fairs
25	Cities	<ul style="list-style-type: none"> (Professional) athletics events became popular in cities
26	Deviance	<ul style="list-style-type: none"> Deviance common (eg disguising 'form' to maintain handicap)
27	Tracks	<ul style="list-style-type: none"> Purpose built tracks or facilities/(by 1850s) most major cities had a (purpose-built) facility
28	Spectators	<ul style="list-style-type: none"> Spectatorism/up to 25,000 spectators at events (by 1850s)
29	Wagering	<ul style="list-style-type: none"> Wagering (still) common or widespread
Class		
30	Amateurism	<ul style="list-style-type: none"> Upper or middle class were amateurs/upper or middle class ran for enjoyment or to test themselves Middle classes organised events
31	Professionalism	<ul style="list-style-type: none"> Lower class were or became professionals/lower class ran to make money
32	Exclusion clause	<ul style="list-style-type: none"> Exclusion clause/was an attempt to separate modern athletics from the old (professional and corrupt) form
33	Exclusion)	<ul style="list-style-type: none"> Manual workers or the working class excluded
34	AAC	<ul style="list-style-type: none"> Amateur Athletics Club (AAC) formed (in 1866)/(AAC) formed by ex-university men or by gentlemen amateurs/not allowed to join (AAC) if a 'mechanic, artisan or labourer' ie if lower or working class/not allowed to join if money earned through running
35	AAA	<ul style="list-style-type: none"> Amateur Athletics Association (AAA) established in 1880/AAA withdrew exclusion clause/AAA opened up the sport to everyone/a professional became someone who ran for money rather than someone from the lower class

Effect of social class on participation in athletics today	
36	<p>Accept any suitable suggestion of how social class affects participation in athletics today eg presence or absence of:</p> <ul style="list-style-type: none"> - social class = disposable income which is linked to availability of transport/opportunity to join club/s or attend sessions/buy kit or equipment • social class can impact on available time (including impact of unemployment) • social class linked to where you live and availability of suitable facilities • social class linked to self esteem and/or status in society and its impact on whether someone wants to participate • social class not as significant today
Effect of social class on performance in athletics today	
37	<p>Accept any suitable suggestion of how social class affects performance in athletics today eg presence or absence of:</p> <ul style="list-style-type: none"> • disposable income linked to availability of coaching/specialist kit or equipment/transport to get to high level facilities • available time eg to train regularly or full time • social class linked to self esteem and/or status in society and its impact on whether someone has self-belief that can impact on performance • social class not as significant today

Question Number	Expected Answer	Marks
Section A – Comparative Studies (Option A2)		
(a)	<p>Many young people in the USA attend summer camps. Outline the aims of summer camps in the USA and suggest why summer camps for young people are less popular in the UK than in the USA.</p> <p>6 marks for 6 of: sub max 5 for first part of question (USA)</p>	
Aims of summer camps are to develop: (sub max 5)		
1	(patriotism)	... patriotism or loyalty to USA
2	(natural environment)	...appreciation of natural environment/conservation awareness/experience of a different environment/appreciation of varied environment within USA/quality of life/get out of cities
3	(safety)	...safety or camp craft or map reading or other skills linked to staying in the natural environment
4	(social development)	...social skills or teamwork or co-operation or leadership or life skills or citizenship (through living together) or to meet people/religion
5	(physical development)	...specific sport or physical skills eg hockey or 'soccer' or to develop active or healthy lifestyles or for self-improvement/ preparation for active leisure
6	(independence)	...independence of self-sufficiency (eg by staying away from home)
7	(self awareness)	...self awareness or self discovery
8	(frontier)	To remind young people of (their heritage) the frontier/to offer (experience of) challenge or adventure or excitement
...suggest why summer camps for young people are less popular in the UK than in the USA (sub max 3)		
9	(tradition)	Lack of tradition for summer camps/lack of expectation/not financial priority in UK/tradition of family summer holidays in the UK
10	(holidays)	Shorter summer break
11	(space)	Less rural or wilderness space for camps
12	(choice)	Parents (or children) do not wish to send their children away for summer

Question Number	Expected Answer		Marks
(b)	Explain and give examples of both stacking and centrality in elite USA sport. Describe other social factors that impact on mass participation in both the USA and the UK.		
	5 marks for 5 of: sub max 4 for first part of question		
Explain and give examples of both stacking and centrality in elite USA sport (sub max 4)			
1	Stacking	The grouping or directing of certain ethnic groups into (or away from) certain positions in sports teams/the disproportionate concentration of ethnic minorities into certain positions in sports teams	
2	(example)	Accept any suitable practical example eg in basketball grouping black players towards forward positions (or away from (central) positions eg guard or centre)	
3	Centrality	When the leadership or decision making positions are held by white or WASP (majority)	
4	(example)	Accept any suitable practical example eg majority of quarter backs in American football team are (still) white/majority of American football or baseball or basketball teams have white coaches and/or managers	
Describe other social factors that impact on mass participation in both the USA and the UK (sub max 3) description rather than simple identification required			
5	(Discrimination)	(Social) discrimination or prejudice or unfairness	
6	(Opportunity)	Presence or absence of: money/ability/time/physical or social access/unemployment/school opportunities	
7	(Provision)	Presence or absence of: suitable: facilities/equipment/coaching/transport/activities/clubs/classes/ where you live/school provision	
8	(Esteem)	Esteem or respect or appreciation or intimidation	
9	(stereotyping)	stereotyping/myths/self-fulfilling prophesy (when a minority group accepts society's view or conforms to stereotype)	
10	(media/publicity)	power of media to influence participation/unaware of opps	
11	(family)	family interests and influence/encouragement from early age/influence or friends or peers/role models	
12	(minority groups)	Whether part of a minority group or gender/provision of suitable activities/suitable timings/lack of crèche facilities or disability/specialist facilities Race or religion/some groups have negative attitudes towards sport/eg Asian women may not take part due to sub-cultural values or personal reluctance or age/young or elderly/bad experience at school so put off for life/lack of suitable instructors or coaches or class/(real or perceived) class constraints leading to limited access/eg access to a polo club or a private tennis or golf club	
13	(health factors)	Obesity or poor health may prevent/participate to become healthy	

Question Number	Expected Answer	Marks
(c)	<p>Describe the strengths and weaknesses of the Australian Institute of Sport (AIS) in the development of sporting excellence. How does the Australian system for pursuing sporting excellence compare with that in the UK?</p> <p>4 marks for 4 of: sub max 3 for pathways – 1 mark for comparison with UK</p>	
AIS – good because: (sub sub max 2)		
1	Best or top quality coaching or facilities or equipment	
2	Best or top quality sport science	
3	Best or top quality medical back up or physiotherapy or equivalent	
4	Surrounded by like-minded people/on-site high quality competition	
5	Opportunities for elite performers to train locally	
6	A large number of 26 different sports provided for	
7	Elite performers receive sponsorship from AIS/elite performers can train full time/elite performers given scholarships/financial support	
8	Elite given performance lifestyle advice (PLA) or athlete career education (ACE)	
AIS – but (sub sub max 2)		
9	Possible problems or burnout	
10	Arguably too great an emphasis on excellence to detriment of mass participation/promotes elitism	
11	(arguably) insufficient preparation for life after sport	
How does the Australian system for pursuing sporting excellence compare with that in the UK? (sub max 1)		
12	No draft system in sport in UK	
13	The sports institutes/centres of excellence in UK direct copies of the AIS	
14	Other routes include academies and county set ups	

Question Number	Expected Answer	Marks
(d)	<p>Compare the game of cricket in Australia and in the UK with reference to tradition, development and the growth of commercialism. How do cultural factors influence excellence in high level cricket in Australia?</p> <p><u>Level 4: – a comprehensive answer</u></p> <ul style="list-style-type: none"> • detailed knowledge & excellent understanding • detailed analysis and excellent critical evaluation • well-argued, independent opinion and judgements which are well supported by relevant practical examples • very accurate use of technical and specialist vocabulary • high standard of written communication throughout. <p>Discriminators from level 3 are likely to include:</p> <ul style="list-style-type: none"> • all parts of the question addressed with balance • excellent insight into the impact of cultural factors • analysis of Ashes mythology. <p><u>Level 3: – a competent answer</u></p> <ul style="list-style-type: none"> • good knowledge & clear understanding • good analysis and critical evaluation • Independent opinions and judgements will be present but may not always be supported by relevant practical examples • generally accurate use of technical and specialist vocabulary • written communication is generally fluent with few errors. <p>Discriminators from level 2 are likely to include:</p> <ul style="list-style-type: none"> • all parts of the question addressed • cultural factors addressed well • reference to Ashes. <p><u>Level 2: – a limited answer</u></p> <ul style="list-style-type: none"> • limited knowledge & understanding • some evidence of analysis and critical evaluation • opinion and judgement given but often unsupported by relevant practical examples • technical and specialist vocabulary used with limited success • written communication lacks fluency and contains errors. <p>Discriminators from level 1 are likely to include:</p> <ul style="list-style-type: none"> • efficient attempt at making direct comparisons • an attempt at addressing the cultural part of question. <p><u>Level 1: – a basic answer</u></p> <ul style="list-style-type: none"> • basic knowledge & little understanding • little relevant analysis or critical evaluation • little or no attempt to give opinion or judgement • little or no attempt to use technical and specialist vocabulary • errors in written communication will be intrusive. 	<p>[18–20]</p> <p>[13–17]</p> <p>[8–12]</p> <p>[0–7]</p>

Indicative content – candidate responses are likely to include (relevant responses not listed should be acknowledged)

	Australia	UK
Tradition/Development		
1	Strong colonial tradition or influence/game adopted from England (former 'motherland') <ul style="list-style-type: none"> First team games played in Australia Sterling and currency 	<ul style="list-style-type: none"> Game originated in England Impact of Hambledon Impact of MCC
2	Traditionally played in schools/high status in schools	Traditionally played in schools/high status in independent schools
3	Defeating England in contemporary sport stimulates national pride <ul style="list-style-type: none"> shows international progress/desire for 'pommie bashing' 	Recent victories have stimulated pride in the UK
4	Political rivalry <ul style="list-style-type: none"> reference to 'bodyline' series (1932/33) 	
5	Status of cricket grounds <ul style="list-style-type: none"> Melbourne 	<ul style="list-style-type: none"> Lords cricket ground
6	Explanation of Ashes (mythology): <ul style="list-style-type: none"> When Aus beat England at Lords (1882) the sporting Times carried obituary stating that the body of English cricket would be cremated and the Ashes take to Australia. 	
7	Ashes series stimulates enormous spectator interest <ul style="list-style-type: none"> patriotism Aus v England spectator banter can border on nationalistic fervour at times 	
8	Huge media or commercial interest <ul style="list-style-type: none"> Huge demand for tickets 	
9	Enthusiastic or loyal supporters who follow Australian team	<ul style="list-style-type: none"> Barmy army reference/touring parties who follow England team
Growth of commercialism		
10	Commercial nature of sport suits economy or suits capitalism <ul style="list-style-type: none"> huge commercial success/sport stars as commercial entities 	
11	The game part of the 'golden triangle' <ul style="list-style-type: none"> heavily influenced by commercialism commercialism strongly linked with professionalism 	
12	(Kerry) Packer introduced World Series cricket (1977) <ul style="list-style-type: none"> ...reducing power of International Cricket Board financial contracts offered to best players 	
13	Australia hosted World Series <ul style="list-style-type: none"> which had: special kit, floodlit games, modified rules, limited overs, a guaranteed result at end of day/cricket became a commercial spectacle 	
14	Impact of Twenty20 games <ul style="list-style-type: none"> cricket World Cup 	

	How do cultural factors influence excellence in high level cricket in Australia?
	Geographical
15	Favourable climate/space <ul style="list-style-type: none"> • plenty of space for cricket ovals • harder pitches allow more bounce which encourages attacking play
16	Urban population keen to see excellence in urban sports (eg major games) <ul style="list-style-type: none"> • small population united by international sporting success
17	Good transport system <ul style="list-style-type: none"> • allows inter-state competition
	Government policy
18	Government support for cricket (and sport in general) <ul style="list-style-type: none"> • Federal and State aid to cricket/happy to spend on sport • Sporting success reflects well on government • Sporting success appeases the people or creates feel good factors
	Social determinants
19	Need for national sporting heroes/high status of sport <ul style="list-style-type: none"> • Australians demand success of their team
20	Impact of women's game
21	Cricket still fundamentally a white (Anglo-Saxon) game in both countries
22	Success stimulates interest
	Also:
23	Sport thought to develop character <ul style="list-style-type: none"> • manliness or teamwork or leadership or other traditional values
24	Bush culture or manliness (shown in or needed for elite cricket)
25	Multi-culturalism or cultural harmony (arguably) achievable in elite team or among spectators

Question Number	Expected Answer	Marks
Section B – Sports Psychology (Option B1)		
(a)	<p>Identify what is meant by an attitude and describe the components of attitudes that young people might have towards sport and health.</p> <p>1 mark for:</p> <p>1 Attitude is a pre-disposition (mixture) or beliefs or feelings or behaviours towards an (attitude) object/something/someone. (eg training or participation in sport).</p> <p>3 marks for: (must be description rather than a list)</p> <p>2 <u>Cognitive</u> element which is a belief about training/playing well/participation/health.</p> <p>3 <u>Affective</u> element which is an emotional aspect such as enjoyment/positive feelings/hostility/negative feelings towards training/playing well/participation/health.</p> <p>4 <u>Behavioural</u> element which is behaviour towards training/playing/health/shows commitment/persistence/sticking to the task/trying hard/avoidance behaviours/giving up.</p>	[4]
(b)	<p>Explain what is meant by cue utilisation and how it links with levels of arousal.</p> <p>5 marks for:</p> <p>(Cue utilisation) sub max 2</p> <p>1 Concentration/focus on what is important/selecting the right signals/stimuli/selective attention</p> <p>2 Ignore irrelevant stimuli</p> <p>3 Using the right attentional control/style/attending with appropriate width/direction</p> <p>(Links with arousal) sub max 4</p> <p>4 Low arousal too many cues/irrelevant cues/both relevant and irrelevant cues/stimuli are selected/attentional field is wide/information overload.</p> <p>5 As arousal raises attention narrows/only relevant cues are processed/hypervigilance.</p> <p>6 At optimal arousal level irrelevant cues are blocked/ignored/gate out (and performance improves)/in the zone</p> <p>7 At high/over arousal relevant cues will be lost (and performance may deteriorate)/irrelevant cues are picked up</p> <p>8 Inverted U can be applied to show relationship between arousal and cue utilisation</p> <p>9 The effectiveness of cue utilisation/arousal depends on the ability of the performer/task complexity/personality</p>	[5]

Question Number	Expected Answer	Marks
(c)	<p>Describe the possible 'faulty processes', identified in the model, that may occur in sport.</p> <p>6 marks for:</p> <p>(Motivational losses)</p> <p>1 Team performance/productivity is affected by social loafing /lack of individual motivation/poor motivation can decrease performance/productivity</p> <p>2 Called learned helplessness/attributions of failure to internal stable factors/losing and blaming themselves/lacks self-confidence/low self-efficacy/inexperience</p> <p>3 Lack of identifiable roles for team members</p> <p>4 Insufficient accountability/individual efforts not recognised</p> <p>5 Injury/illness of players may lead to lack of motivation/fatigue</p> <p>6 Lack of team cohesion/lack of social cohesion/disputes/perceptions that others are not trying</p> <p>7 Insufficient incentives to work together/work as a team/lack of common goals/group incentive</p> <p>8 Too high a level of competition/anxiety of team/individuals/goal perceived to be unachievable/losing</p> <p>9 Negative effects of an audience/crowd de-motivates/criticises performer/officials' decisions</p> <p>10 Environmental factors/stressors may lead to lack of motivation</p> <p>(Co-ordination losses)</p> <p>11 Team performance affected by lack of co-ordination/working together/lack of communication</p> <p>12 Ringelmann effect/individual performance decreases as group size increases</p> <p>13 Inadequate leadership</p> <p>14 Poor team tactics/strategies</p>	[6]

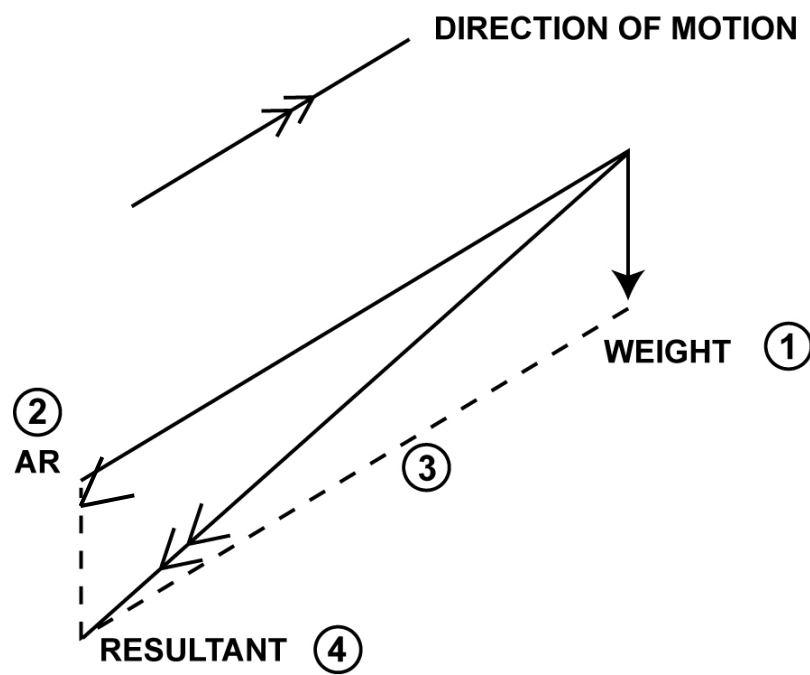
Question Number	Expected Answer	Marks
(d)	<p>Using practical examples, explain and critically evaluate the cognitive and somatic anxiety management techniques that may be used by performers in sport.</p> <p>Levels Mark scheme</p> <p><u>Level 4 – a comprehensive answer</u></p> <ul style="list-style-type: none"> • detailed knowledge & excellent understanding • detailed analysis/ critical evaluation and excellent critical evaluation • well-argued, independent opinion and judgements which are well supported by relevant practical examples • very accurate use of technical and specialist vocabulary • high standard of written communication throughout. <p>Discriminators from L3 are likely to include:</p> <ul style="list-style-type: none"> • most types of cognitive and somatic strategies explained rather than described • practical examples are consistently used effectively to give context • at least three evaluative points made • Frequent use of/links with relevant psychological terminology/theories. <p><u>Level 3 – a competent answer</u></p> <ul style="list-style-type: none"> • good knowledge & clear understanding • good analysis and critical evaluation • Independent opinions and judgements will be present but may not always be supported by relevant practical examples • generally accurate use of technical and specialist vocabulary • written communication is generally fluent with few errors. <p>Discriminators from L2 are likely to include:</p> <ul style="list-style-type: none"> • both cognitive and somatic strategies are often described rather than explained • practical examples are used at times to give context • at least two evaluative points made • Some use of/links with relevant psychological terminology/theories. <p><u>Level 2 – a limited answer</u></p> <ul style="list-style-type: none"> • limited knowledge & understanding • some evidence of analysis and critical evaluation • opinion and judgement given but often unsupported by relevant practical examples • technical and specialist vocabulary used with limited success • written communication lacks fluency and contains errors. 	<p>[18–20]</p> <p>[13–17]</p> <p>[8–12]</p>

	<p>Discriminators from L1 are likely to include:</p> <ul style="list-style-type: none"> • either cognitive and somatic strategies are mostly described • practical examples are used rarely to give context • at least one evaluative point is made • little use of/links with relevant psychological terminology/theories <p><u>Level 1 – a basic answer</u></p> <ul style="list-style-type: none"> • basic knowledge & little understanding • little relevant analysis or critical evaluation • little or no attempt to give opinion or judgement • little or no attempt to use technical and specialist vocabulary • errors in written communication will be intrusive. <p>Features of this level include:</p> <ul style="list-style-type: none"> • few cognitive and somatic strategies are described and at times inaccurately • practical examples if used are often irrelevant • little or no evaluative material • little or incorrect use of/links with relevant psychological terminology/theories. 	[0–7]
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Question Number	Expected Answer	Mark
	<p>Indicative content – candidate responses are likely to include (relevant responses not listed/should be acknowledged)</p> <p>(Cognitive)</p> <ol style="list-style-type: none"> 1. Cognitive techniques help to control psychological anxiety/arousal <ul style="list-style-type: none"> • psychological relaxation can help physiological relaxation 2. Mental rehearsal <ul style="list-style-type: none"> • involves going over/mentally repeating what needs to be done • meditation/mantra • mental practice 3. Imagery involves creating mental pictures of what needs to be done <ul style="list-style-type: none"> • count to 10 • or mental pictures to control arousal 4. Positive self-talk/ positive rational thinking <ul style="list-style-type: none"> • involves making internal statements that lead to success/reflecting on past success 5. Goal setting (that is SMART) <ul style="list-style-type: none"> • can help to manage anxiety 6. (Negative) thought stopping <ul style="list-style-type: none"> • blocks out irrational or negative thoughts • use of music <p>(Somatic)</p> <ol style="list-style-type: none"> 7. Somatic techniques can help to control physiological/body arousal/stress <ul style="list-style-type: none"> • physiological relaxation can help psychological relaxation • deep breathing/yoga 8. Progressive muscle relaxation <ul style="list-style-type: none"> • helps the body deal with stress by contracting and then relaxing groups of muscles • Muscular relaxation involves relaxation of muscles to enable overall relaxation 9. Biofeedback <ul style="list-style-type: none"> • gives awareness of body and thus more able to deal with stress experienced. <p>(Evaluative comments)</p> <ol style="list-style-type: none"> 10. Difficult skills to apply to ‘real life situations’ <ul style="list-style-type: none"> • good in practice does not always mean good in the game 11. Not all have the ability/willingness to be able to do these <ul style="list-style-type: none"> • Personality can affect anxiety management 12. May be too relaxed to make decisions/perform/focus effectively <ul style="list-style-type: none"> • may lose determination caused by anxiety (flight/fight response) 13. Some research and anecdotal evidence to support their use/may have positive influence on psychological physiological arousal <ul style="list-style-type: none"> • anxiety can help to relax and • be less irritable • more able to focus/make decisions • gives confidence 	[0–7]

	<p>14. To explain or evaluate effective links are made to psychological material such as arousal/state/trait anxiety</p> <ul style="list-style-type: none">• zone of optimal functioning (peak flow)• ability and complexity of the task/sport/activity.• eg cognitive anxiety management links with lowering the level of arousal/can enable optimum arousal to enter the zone of optimal functioning.• eg somatic anxiety management links with individual differences. For example your personality characteristics may affect your ability to control stress/anxiety. <p>15. Some techniques involve equipment that cannot be used in sports situations/time constraints</p> <ul style="list-style-type: none">• biofeedback equipment• no time for PMR	
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Question Number	Expected Answer	Marks
Section B – Biomechanics (Option B2)		
4 (a)	<p>Sketch a diagram of a 2nd class lever system and identify the load arm and effort arm on your diagram. Give an example of this type of lever system from the human body when it is used in sports performance and explain why it is the most efficient class of lever system.</p> <p>4 marks in total from:</p> <ol style="list-style-type: none"> 1 Fulcrum, load and effort in correct position 2 Effort arm and load arm correctly identified 3 Plantar flexion of the ankle when jumping in basketball/standing on tiptoes or eq 4 Most efficient lever system because the load is closer to the fulcrum than the effort/effort further away from fulcrum than load 5 Therefore, it requires less effort to move an equivalent load. 	[4]
(b)	<p>Figure 2 shows a speed-time graph of a sprinter of mass 80 kg completing 100 m.</p> <p>Using information from the graph:</p> <ol style="list-style-type: none"> (i) Calculate the acceleration of the sprinter between 1 and 3 seconds. (ii) Calculate the average force acting on the sprinter between 1 and 3 seconds. (iii) Explain the motion of the sprinter between points A and B and between points B and C. <p>6 marks in total for:</p> <p>(acceleration)</p> <ol style="list-style-type: none"> 1 $a = v-u/t$ or acceleration = change in velocity/time or 7-2/2 2 $a = 2.5 \text{ ms}^{-2}$ (units must be correct) <p>(average force)</p> <ol style="list-style-type: none"> 3 $F = ma$ or $F = 80 \times 2.5$ (or whatever answer for acceleration in point 2) 4 $F = 200 \text{ N}$ (units must be correct) (or correct answer using point 3) <p>(explanation)</p> <ol style="list-style-type: none"> 5 (A to B) The sprinter is at a constant speed/velocity because all the forces acting on him are balanced/net or resultant force = 0 6 (B to C) The sprinter is decelerating/slowing down because the unbalanced/net/resultant forces are acting against him 	[6]

Question Number	Expected Answer	Marks
(c)	<p>Use a diagram to work out the resultant force acting on a hard hit badminton shuttle during the early stages of the flight path of a long serve. Explain the effect of the resultant force acting on the flight path of the shuttle.</p> <p>5 marks in total from:</p> <p>(diagram) Sub max 4</p> <ol style="list-style-type: none"> 1 Weight acting downwards. 2 Air resistance acting opposite to the direction of motion and significantly larger than weight. 3 Use of parallelogram Law. 4 Resultant force.  <p>(explanation) Sub max 4</p> <ol style="list-style-type: none"> 5 RF shows the direction of acceleration 6 Acceleration is (almost) in the opposite direction to motion therefore shuttle will decelerate/slow down (rapidly) 7 Makes flight path asymmetrical/non parabolic 8 Shortens flight path. 	[5]

Question Number	Expected Answer	Marks
(d)	<p>Use Newton's Laws of Motion to explain the relationship between impulse and the motion of the high jumper during take off. Explain how the high jumper uses the centre of mass in order to maximise performance. Explain the relationship between impulse and decreasing momentum when landing on the safety bed.</p>	[20]
	<p><u>Level 4: – a comprehensive answer</u></p> <ul style="list-style-type: none"> • detailed knowledge & excellent understanding • detailed analysis and excellent critical evaluation • well-argued, independent opinion and judgements which are well supported by relevant practical examples • very accurate use of technical and specialist vocabulary • high standard of written communication throughout. <p>Discriminators from L3 are likely to include:</p> <ul style="list-style-type: none"> • detailed application of Newton's Laws of Motion to the force-time graph • detailed understanding of the relationship between impulse and the resulting motion of the high jumper through the different phases of the force-time graph • detailed understanding of how and why the high jumper changes the position of the CM to maximise performance • accurate explanation of the relationship between impulse and decreasing momentum during landing • good use of technical language throughout the answer. <p><u>Level 3: – a competent answer</u></p> <ul style="list-style-type: none"> • good knowledge & clear understanding • good analysis and critical evaluation • Independent opinions and judgements will be present but may not always be supported by relevant practical examples • generally accurate use of technical and specialist vocabulary • written communication is generally fluent with few errors. <p>Discriminators from level 2 are likely to include:</p> <ul style="list-style-type: none"> • reasonable application of Newton's Laws of Motion to the high jumper taking off • reasonably good explanation of impulse in different phases of the force-time graph • evidence of understanding how a high jumper changes the position of the CM during flight • reasonable understanding of the relationship between impulse and decreasing momentum in order to prevent injury • some use of correct technical language. 	<p>[18–20]</p> <p>[13–17]</p>

Question Number	Expected Answer	Marks
	<p>Indicative Content – candidate responses are likely to include (relevant responses not listed should be acknowledged)</p> <p>(Impulse/graph)</p> <p>A to B</p> <p>1 (Newton 1) An object will remain at rest unless acted upon by an unbalanced/external force</p> <ul style="list-style-type: none"> • Newton 1 tells us that the jumper will remain stationary/will not accelerate <p>2 Impulse = area underneath force-time graph</p> <ul style="list-style-type: none"> • Impulse = force x time/change in momentum <p>3 (A to B) Impulse = 0</p> <ul style="list-style-type: none"> • therefore net/resultant force = 0 <p>B to C</p> <p>4 Impulse is negative</p> <ul style="list-style-type: none"> • Therefore net force is negative/downwards <p>5 Forces unbalanced/Weight > Reaction</p> <ul style="list-style-type: none"> • Newton 1 tells us that the jumper will not remain stationary/will accelerate <p>6 (Newton 2) The acceleration of an object is directly proportional to the (net) force applied to it</p> <ul style="list-style-type: none"> • Newton 2 tells us that the jumper will accelerate <p>7 (Newton 2) Acceleration takes place in same direction of (net) force</p> <ul style="list-style-type: none"> • (accelerate) downwards • Occurs when jumper flexes/bends their knees <p>C to D</p> <p>8 Impulse is positive</p> <ul style="list-style-type: none"> • Therefore net/resultant force is positive/upwards <p>9 Forces unbalanced/Reaction > Weight</p> <ul style="list-style-type: none"> • Newton 2 tells us that the acceleration is upward <p>10 (Newton 3) For every action there is an equal and opposite reaction</p> <ul style="list-style-type: none"> • Newton 3 tells us this is because the jumper has applied a force DOWNWARDS into the ground • Therefore the ground has applied an UPWARDS force on the jumper <p>D to E</p> <p>11 Impulse is still positive/net force is still positive</p> <ul style="list-style-type: none"> • Jumper will accelerate until foot leaves the floor <p>12 Jumper is fully extending legs</p> <ul style="list-style-type: none"> • to increase the time force is applied to the ground by the jumper <p>13 Increases overall impulse on jumper/upwards</p> <ul style="list-style-type: none"> • Increases upwards momentum <p>14 Increases upwards velocity/speed</p> <ul style="list-style-type: none"> • Increases height achieved <p>(Centre of Mass)</p> <p>15 CM is the point at which the jumper is balanced in all directions</p> <ul style="list-style-type: none"> • Point where mass is said to be concentrated • Point from where weight acts 	

Question Number	Expected Answer	Marks
	<p>16 Position of CM can move by changing body shape/position</p> <ul style="list-style-type: none"> • High jumper arches back during flight to move CM outside/underneath the body <p>17 CM follows pre-determined flight path/reaches predetermined height after take off</p> <ul style="list-style-type: none"> • High jumper passes over bar whilst CM passes underneath the bar • High jumper clears higher bar <p>(Impulse/landing)</p> <p>18 Landing bed increases time of decreasing momentum/stopping jumper</p> <ul style="list-style-type: none"> • Extends time that forces act on high jumper <p>19 Impact/forces on body are significantly decreased</p> <ul style="list-style-type: none"> • Reduces risk of injury 	

Question Number	Expected Answer	Marks
Section B – Exercise and Sport Physiology (Option B3)		
(a)	<p>Define the terms endothermic reaction and exothermic reaction. Give an example for each type of reaction.</p> <p>4 marks in total</p> <p>1 (Endothermic reaction) when a group of elements combine to form a compound (this is known as a synthesis reaction/requires energy/heat 2 eg $ADP + P + energy \rightarrow ATP/P + C + energy \rightarrow PC$ 3 (Exothermic reaction) when a compound is broken down into smaller products/this is known as a decomposition reaction/releases energy/heat 4 eg $ATP \rightarrow ADP + P + energy/PC \rightarrow P + C + energy$</p> <p>(b)</p> <p>Describe how you would perform a stretch during a proprioceptive neuromuscular facilitation (PNF) session. Explain the physiological principle behind this type of flexibility training.</p> <p>5 marks in total Sub max 3 marks for description</p> <p>1 muscle is taken to the point of resistance 2 isometric contraction is performed (for approx 5 seconds) 3 against immovable object or partner 4 immediately muscle is relaxed/allow recovery 5 take slightly beyond point of resistance/repeat 6 hold stretch for approx 10–30 seconds</p> <p>Sub max 3 marks for explanation</p> <p>7 when muscle is stretched it triggers the muscle spindles 8 response is to contract/shorten the muscle 9 when muscle is contracted it triggers the golgi tendon organs 10 response is to relax/lengthen the muscle 11 if stretch is immediate then the muscle spindle (stretch reflex) is momentarily overridden allowing greater stretch/inhibiting stretch reflex</p>	

Question Number	Expected Answer	Marks
(c)	<p>Explain the effect of <u>three</u> of the adaptations to endurance training listed in Fig. 4 on aerobic performance</p> <p>6 marks in total Sub max 2 for each adaptation</p> <p>(increased cardiac output) (sub max 2) 1 (hypertrophy of the heart) results in more blood being pumped out of the heart/around body 2 Therefore more oxygenated blood is delivered to skeletal muscle</p> <p>(increased red blood cell count) (sub max 2) 3 more haemoglobin 4 increasing the oxygen carrying capacity of the blood/more oxygen can be delivered to muscle</p> <p>(increased mitochondrial size and density) (sub max 2) 5 Mitochondria is where aerobic metabolism takes place/respiration 6 greater production of ATP</p> <p>(increased myoglobin concentration) (sub max 2) 7 Myoglobin has an affinity for oxygen (and is located in the cells) 8 Therefore more oxygen can be transported to the mitochondria (for aerobic metabolism)/increased O₂ stores in muscle/delays OBLA</p> <p>(increased oxidative enzyme concentrations) (sub max 2) 9 Enzymes control the rate of a reaction 10 Therefore aerobic metabolism occurs faster</p> <p>(increased glycogen stores) (sub max 2) 11 glycogen is a food fuel stored in the cell/energy source 12 produce more ATP/energy/athlete can perform for longer for muscular work</p>	

Question Number	Expected Answer	Marks
(d)	<p>With reference to Fig. 5 give reasons for the trend in lactate levels shown in the areas marked easy, hard and unsustainable. Explain the training methods that can be used to increase a performer's lactate threshold.</p> <p>20 marks in total</p> <p><u>Level 4:- a comprehensive answer</u></p> <ul style="list-style-type: none"> • detailed knowledge & excellent understanding • detailed analysis and excellent critical evaluation • well-argued, independent opinion and judgements which are well supported by relevant practical examples • very accurate use of technical and specialist vocabulary • high standard of written communication throughout. <p>Discriminators from L3 are likely to include:</p> <ul style="list-style-type: none"> • a thorough understanding of lactate threshold and OBLA is shown • a thorough balanced answer with sound knowledge drawn from three areas of graph • a thorough understanding of more than one method of training that can be used to increase lactate threshold • a thorough understanding of the adaptations to aerobic training with regard to lactate. <p><u>Level 3: – a competent answer</u></p> <ul style="list-style-type: none"> • good knowledge & clear understanding • good analysis and critical evaluation • independent opinions and judgements will be present but may not always be supported by relevant practical examples • generally accurate use of technical and specialist vocabulary • written communication is generally fluent with few errors. <p>Discriminators from L2 are likely to include:</p> <ul style="list-style-type: none"> • an awareness of lactate threshold and OBLA is shown • a sound balanced answer with reasonable knowledge drawn from three areas of graph • a satisfactory understanding of more than one method of training that can be used to increase lactate threshold • a satisfactory understanding of the adaptations to aerobic training with regard to lactate. <p><u>Level 2: – a limited answer</u></p> <ul style="list-style-type: none"> • limited knowledge & understanding • some evidence of analysis and critical evaluation • opinion and judgement given but often unsupported by relevant practical examples • technical and specialist vocabulary used with limited success • written communication lacks fluency and contains errors. 	<p>[18–20]</p> <p>[13–17]</p> <p>[8–12]</p>

	<p>Discriminators from L1 are likely to include:</p> <ul style="list-style-type: none">• An awareness of lactate threshold• Some understanding of one method of training that can be used to increase lactate threshold• Identification of some of the adaptations to aerobic training with regard to lactate. <p><u>Level 1: – a basic answer</u></p> <ul style="list-style-type: none">• basic knowledge & little understanding• little relevant analysis or critical evaluation• little or no attempt to give opinion or judgement• little or no attempt to use technical and specialist vocabulary• errors in written communication will be intrusive.	<p>[0–7]</p>
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Question Number	Expected Answer	Marks
	<p>Indicative Content – candidate responses are likely to include (relevant responses not listed should be acknowledged)</p> <p>(easy)</p> <p>1 exercise intensity is sub maximal</p> <ul style="list-style-type: none"> • indicated by heart rate between 100bpm and 130bpm/low power output <p>2 aerobic energy system is predominant</p> <ul style="list-style-type: none"> • anaerobic systems make some contribution • reference to energy continuum <p>3 lactate levels remain constant/steady state/low</p> <ul style="list-style-type: none"> • equilibrium between lactate production and lactate removal <p>4 lactate that is produced is used as a fuel for aerobic energy</p> <ul style="list-style-type: none"> • lactate is taken to the liver for conversion (cori cycle) to glucose/glycogen • lactate removed in sweat <p>(hard)</p> <p>5 lactate threshold is reached at 210 watts/130bpm</p> <ul style="list-style-type: none"> • Lactate threshold is the point during exercise of increasing intensity when blood lactate begins to accumulate above resting levels <p>6 lactate levels now begin to increase as work intensity increases</p> <ul style="list-style-type: none"> • increase in rate of anaerobic metabolism/lactic acid system • increase in innervation of Type 2b motor units/fast twitch fibres <p>7 increase in demand for oxygen for aerobic metabolism</p> <ul style="list-style-type: none"> • increase pulmonary ventilation/minute ventilation <p>(unsustainable)</p> <p>8 OBLA reached at approx 3.5 mmol/l/270 watts/150bpm</p> <ul style="list-style-type: none"> • Onset of blood lactate accumulation shown by steep/sudden increase in lactate levels to exhaustion <p>9 increase in pyruvate production/pH level drop</p> <ul style="list-style-type: none"> • Inhibit enzyme action <p>10 Performer cannot sustain work intensity</p> <ul style="list-style-type: none"> • Due to pain fatigue <p>(training methods to increase lactate threshold)</p> <p>11 Lactate threshold is the point during exercise of increasing intensity when blood lactate begins to accumulate above resting levels (nb point can only be awarded once – see point 5)</p> <p>12 continuous training to raise lactate threshold</p> <ul style="list-style-type: none"> • description <p>13 fartlek training to raise lactate threshold</p> <ul style="list-style-type: none"> • description <p>14 interval/repetition training to raise lactate threshold</p> <ul style="list-style-type: none"> • description <p>15 use of target training heart rates to work at right intensity</p> <ul style="list-style-type: none"> • description <p>16 use of altitude training</p> <ul style="list-style-type: none"> • description 	

Question Number	Expected Answer	Marks
	<p data-bbox="328 264 986 293">Explanation as to why these methods are used</p> <p data-bbox="328 297 1166 327">17 Adaptations to training result in greater tolerance of lactate</p> <ul data-bbox="328 331 903 398" style="list-style-type: none"><li data-bbox="328 331 903 360">• And more efficient utilisation of lactate<li data-bbox="328 365 903 394">• Due to more efficient buffering system <p data-bbox="328 398 1246 465">18 As better oxygen utilisation means more pyruvate can be broken down aerobically</p> <ul data-bbox="328 470 1062 499" style="list-style-type: none"><li data-bbox="328 470 1062 499">• Lactate clearance/removal becomes more efficient <p data-bbox="328 504 1007 533">19 Aerobic training results in greater fat utilisation</p> <ul data-bbox="328 537 746 566" style="list-style-type: none"><li data-bbox="328 537 746 566">• so less pyruvate produced <p data-bbox="328 571 783 600">20 Can use dietary supplements</p> <ul data-bbox="328 604 671 672" style="list-style-type: none"><li data-bbox="328 604 671 633">• sodium bicarbonate)<li data-bbox="328 638 600 667">• to act as buffer	

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

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Telephone: 01223 553998

Facsimile: 01223 552627

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