



GCE

Physical Education

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

Advanced GCE

Mark Scheme for June 2017

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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Annotations used in the detailed Mark Scheme (to include abbreviations and subject-specific conventions)

Annotation	Meaning
✓	= Correct response
BOD	= Benefit of the doubt
REP	= Repeat
TV	= Too Vague
DEV	= Development (levels scheme)
SEEN	= Noted but no credit given
L1	= Level 1 (levels scheme)
L2	= Level 2 (levels scheme)
L3	= Level 3 (levels scheme)
L4	= Level 4 (levels scheme)
EG	= Practical example (levels scheme)
S	= Sub max

Subject-specific Marking Instructions

Marking responses ‘a – c’; points marked questions

An element of professional judgement is required in the marking of G453. Correct answers should always be rewarded irrespective of whether or not they appear on the mark scheme. If you are in doubt about the validity of any answer then consult your Team Leader (Supervisor) by phone, scoris messaging or e-mail.

Marking response ‘d’; levels of response marked question

It is quite possible for an excellent and valid answer to contain knowledge and arguments which do not appear in the indicative content on the mark scheme. Each answer must be assessed on its own merits according to the generic descriptors and discriminators.

The levels of response descriptors are cumulative, ie a description at one level builds on or improves the descriptions at lower levels. Not all qualities listed in a level must be demonstrated in an answer for it to fall in that level.

Candidates will take different approaches to achieve within the same level. Some will adopt a less focused approach but demonstrate a wide range of knowledge others may adopt a more focused approach using a narrower range of well-developed knowledge.

Approach to marking levels of response questions:

- read the candidate response in full;
- working from the top down and using a *best-fit* approach, refer to the generic descriptors and discriminators to determine the level;
- re-read the answer, highlighting credit worthy aspects of the response in relation to knowledge, understanding, development, examples, etc;
- confirm or revise initial decision re level;
- determine the mark within the level as per the guidance in 10 (above), with reference to the discriminators, and, again, using a *best-fit* approach.

Section A – Historical studies

Question	Answer	Marks	Guidance
1 (a)	<p>5 marks for 5 from:</p> <p>Sub max two marks (objectives)</p> <ol style="list-style-type: none"> (Objective) Improve fitness / physicality (Objective) Military preparation or familiarity with weapons/combat or preparation for war/ little soldiers (Objective) Discipline/obedience <p>Sub max two marks (methodology)</p> <ol style="list-style-type: none"> (Methodology) Command (response) style / drill or group response/no individuality/ or girls and boys together/ or all ages (Methodology) Taught by non-commissioned officers (NCOs) (Methodology) Centralised approach (Methodology) In ranks <p>Sub max one mark (Colonel Fox)</p> <ol style="list-style-type: none"> (Colonel Fox) worked for the War Office (Colonel Fox) recognised the lack of fitness or called for curriculum / course to be revised / changed 	5	<p>Candidate must address objectives, methodology and role of Colonel Fox for full marks. Fit for war = pt2</p> <p>Marching = vague</p>
1 (b)	<p>5 marks for 5 from:</p> <ol style="list-style-type: none"> (Transport/communication) Limited transport/communication so sports / (unwritten) rules were local (Education) Lack of education/illiteracy so unwritten/few simple rules/uncodified/ limited organisation (Law and order) Harsh lifestyle or lack of police force so sport was violent (Rural) Life was agricultural/focus on village life so sport was rural/natural (Seasonal) Seasonal time /limited free time/Holy days so sport was occasional/took place at festivals (Feudal) Feudal/two-class system so classes didn't mix/played different sports (Poverty) Poverty/lack of technology/equipment so sport was simple (Rags to riches/ occupational) Sport was occupational / wagering so was an opportunity to earn money / go from rags to riches 	5	<p>There must be a link between the factor and how it influenced pop rec. Do not accept No rules (pt 2)</p>

1 (c)	<p>5 marks for 5 from:</p> <ol style="list-style-type: none"> 1. (More) social control 2. Civilising process or eliminating anti-social behaviour or reduced bullying 3. Games were confined to the school's grounds or stopped /limited trespassing / Hunting/shooting banned 4. House system introduced (formed basis for sports teams) or inter-house games or games afternoons 5. Masters/house masters appointed with pastoral role outside the classroom or restricted punishments by masters or improved social relations 6. (Team games) encouraged as character-building or encouraged moral values (accept individual values) and sportsmanship/fair play 7. Prefects/6th formers given responsibility / acted as police force / organised games or fights to be supervised by prefects 8. Muscular Christianity or chapel was made central to school life 9. Modified the curriculum/what was taught (less Latin/Greek/made more interesting) or he broadened the curriculum or increased variety of subjects 10. He encouraged health / cleanliness 	5	6 th formers as role Models = vague
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1 (d)* Level Descriptors	Discriminators
<p>Level 4 (18-20 marks) A comprehensive answer:</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. 	<ul style="list-style-type: none"> • Excellent understanding of factors affecting the development of cricket. • Many factors affecting cricket's development will be developed. • Detailed evaluation of the impact of these factors on participation in cricket today. • At the top end of this level evaluation will include both positive and negative impacts. • At the bottom of this level many factors have been considered and their impact evaluated.
<p>Level 3 (13-17 marks) A competent answer:</p> <ul style="list-style-type: none"> • good knowledge and 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. 	<ul style="list-style-type: none"> • Good understanding of factors affecting the development of cricket. • Good evaluation of the impact of these factors on participation in cricket today. • At the top of this level both parts of the question have been covered with balance • At the middle of this level evaluation of impacts may be covered but are not always backed up by relevant examples • At the bottom of this level both parts of the question have been addressed but emphasis may be on historical factors
<p>Level 2 (8-12 marks) A limited answer:</p> <ul style="list-style-type: none"> • limited knowledge and 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. 	<ul style="list-style-type: none"> • Limited understanding of the factors affecting the development of cricket • Some evaluation of the impact of a few of these factors and there may be general points made that are not directly related to cricket. • At the top of this level there is knowledge of some factors affecting cricket's development together with a limited evaluation of impacts or one part of the question is answered very well but the other is not really addressed. • At the middle of this level a few factors are explained and some evaluative comments are made • At the bottom of this level a few factors are identified and at least one evaluative point is made that is relevant to participation in cricket today
<p>Level 1 (1 – 7 marks) A basic answer:</p> <ul style="list-style-type: none"> • basic knowledge and 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. 	<ul style="list-style-type: none"> • Basic knowledge of a few factors affecting the development of cricket • Little or no evaluation of the impact of any factors on participation in cricket today. • At the top of this level some relevant points about the development of cricket are made and there is a basic attempt to evaluate participation in cricket today • At the middle of this level several valid points are made covering both parts of the question.
<p>[0 marks] No response or no response worthy of credit.</p>	

Question	Answer	Guidance
1 (d)*	Indicative content: Candidate responses are likely to include: (relevant responses not listed should be acknowledged) <i>(Describe the factors that have helped in the development of cricket in the UK and evaluate the impact of these factors on contemporary participation in cricket.)</i>	
	<ol style="list-style-type: none"> 1. (Pop rec)village game played in summer months <ul style="list-style-type: none"> • Both classes played together • Game played by women • Non-violent nature of game or gentlemanly behaviour/sportsmanship • Early organisation/rule structure • (Eval) e.g. Reference to family game/recreational game played together in park/at beach or adaptable rule structure of such games • Hambledon/ Bat and Ball Inn/ early player influence 2. (MCC) Marylebone cricket club formed as NGB (in 1787) <ul style="list-style-type: none"> • Laws of cricket written (by MCC) (in 1788) • (ECB) Role of ECB to promote/increase participation • (Eval)Cricket development officers/specialist coaches • (Eval)Support available to clubs and schools • (Eval)Club mark/chance to Shine • (Eval)All Stars cricket initiative (for age 5-8) • (Eval) e.g. strategy more focused on clubs, arguably improving performance not numbers of participants 3. (Class/patronage) Upper class patronage of working class professionals <ul style="list-style-type: none"> • Good players employed by gentry as servants / gardeners etc • Working class needed to make up numbers/ became fielders/ bowlers • Decline of patronage (in 1840s) • (Eval) e.g. class no longer an issue affecting participation • (Eval) e.g. but ...some still see cricket as a middle/upper class game 4. (Amateur/professional) played together but had different roles <ul style="list-style-type: none"> • Gentlemen (amateur) and players (professional) or lower social status of professionals • Entered ground by different gates / travelled to ground separately 	<p>Examiners to highlight evaluations during marking KU for main point DEV for development of point</p> <p>Examples of evaluations of the impact on contemporary participation in cricket have been given alongside the factors that have helped in the development of cricket.</p> <p>Candidates may evaluate factors directly or as a separate section after describing factors.</p> <p>Other evaluations may be accurate and acceptable.</p> <p>At the top of level 4 candidates are expected to evaluate contemporary participation in cricket positively and negatively e.g. more free time is available today due to shorter working hours than in C19 so cricket can be played, but many are now committed to working on</p>

	<ul style="list-style-type: none"> Names appeared differently on scorecards Gentlemen were captains Some aspects of 'shamateurism' (WG Grace) (Eval) e.g. Now opportunities available to earn money as 'professional' at clubs (Eval) e.g. Blurring of amateurism and professionalism in contemporary cricket <p>5. (Public schools) Public schools embraced cricket or cricket had high status</p> <ul style="list-style-type: none"> Respectable/non-violent Encouraged moral integrity/fair play E.g. 'walking' if you know you are out Professional coaches employed (Eval) e.g. today greater participation/opportunity in independent schools due to better facilities/coaching/high status (or opposite for (most) state schools) (Eval) e.g. most schools offer cricket as part of NC (Eval) e.g. pressure for exam success may restrict participation (Eval) e.g. seasonal nature may affect participation <p>6. (Transport) Development of railways allowed touring teams</p> <ul style="list-style-type: none"> William Clarke XI or professional touring team Growth of spectatorism/huge crowds attracted Large amounts of money raised through gate receipts County teams created (in 1870s) (Eval) e.g. growth in car ownership means ease of travel today (Eval) e.g. increase in international travel / use of air travel / international fixtures (Eval) e.g. but for some people transport may be an issue <p>7. (Free time) Increased free time allowed people to play/spectate regularly</p> <ul style="list-style-type: none"> Saturday half day (Eval) e.g. nowadays many people have more free time for many people to play cricket (Eval) but increase in working at weekends/part time jobs may restrict participation <p>8. (Increased law and order) reduced wagering</p> <ul style="list-style-type: none"> Reduced wagering limited match fixing (arguably) raised status of game re fair play ethic (Eval) e.g. bribery/corruption/match fixing/spot-fixing are major issues currently affecting game 	<p>Saturdays and as a result this restricts opportunities to play club cricket.</p>
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	<p>9. (Media/communication) media coverage/match reports in newspapers</p> <ul style="list-style-type: none"> • E.g. The Times (since 1795) • Wisden (cricket almanack) annually published (since 1865) • Impact of Kerry Packer • Impact of Sky/satellite TV networks • (Eval) Excellent/significant amount of coverage on satellite channels or limited coverage of cricket on terrestrial TV impacts on opportunities to watch/learn game <p>10. (Ashes) Importance of England v Australia/international touring teams</p> <ul style="list-style-type: none"> • Reference to The Ashes/intense rivalry • (Eval) Good or poor England performances impact on grass roots participation <p>11. (Role models) Role models raise awareness of cricket</p> <ul style="list-style-type: none"> • E.g. W. G. Grace • Reference to W. G. Grace as 'bigger than the game itself' • (Eval) e.g. Named current role model as inspiration • (Eval) but bad behaviour/match fixing may put people off participation <p>12. (Technology) Development of improved equipment (which enhances game)</p> <ul style="list-style-type: none"> • Better bats mean more sixes/more excitement • Improved protective equipment e.g. pads/helmets • Bowling machines to improve batting techniques • Use of technology for umpiring decisions • (Eval) e.g. compulsory use of helmets/safety as a priority increases participation • (Eval) but ... reference to death of Philip Hughes/Australian batsman struck by ball on base of skull may affect participation for some • (Eval) the positives/negatives of using technology for umpire decisions <p>13. (Facilities) Improvement in pitches/cricket grounds</p> <ul style="list-style-type: none"> • Historically pitches were poor/uncovered pitches • Technology to improve pitches e.g. rollers/covers • Artificial wickets developed • (Eval) e.g. cricket can be played on beach/in park or availability of places to play or in inner 	
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	<p>cities there may be a lack of safe places to play</p> <ul style="list-style-type: none"> • (Eval) e.g. better skill level <p>14. (Commercialism) media hype/marketing of big games</p> <ul style="list-style-type: none"> • Advertising/sponsorship at grounds or on shirts • Now a multimillion pound business • (Eval) (negative publicity) e.g. match fixing reflects badly on participation <p>15. (Formats) Different formats of game have stimulated greater interest</p> <ul style="list-style-type: none"> • Test cricket becoming less appealing to spectators in some countries • Shorter versions/limited overs/Twenty 20 cricket • Indoor cricket • E.g. IPL or Big Bash (stimulate interest via TV coverage) • (Eval) e.g. excitement of shorter formats a major attraction • (Eval) e.g. reference to development of 8 over cricket to stimulate state school involvement <p>16. (Women) Women have always played cricket</p> <ul style="list-style-type: none"> • Role of women in developing round-arm/over-arm bowling • More recently, success of England women's cricket team • County cricket/leagues for women/girls mirrors men's game • Role model e.g. Charlotte Edwards • (Eval) e.g. large increase in female participation today ... but are they attracted away from other sports/already participating in other sports? <p>17. (Adapted games) Cricket games adapted for people with disabilities</p> <ul style="list-style-type: none"> • British association for cricketers with disabilities • E.g. blind cricket or deaf cricket or wheelchair cricket or walking cricket • (Eval) e.g. inclusive nature of these games increases participation • (Eval) e.g. age is not a barrier to participation in cricket 	
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Section A – Comparative Studies

Question	Answer	Marks	Guidance
2 (a)	<p>5 marks for 5 from:</p> <p>Sub max three marks (structure)</p> <ol style="list-style-type: none"> 1.(Structure) based in Canberra or established in 1981 2.(Structure) State Institutes of Sport (SIS) set up in each state 3.(Structure) Funded (mostly) by federal government 4.(Structure) Works in conjunction with National Sporting Organisations (NSOs) 5.(Structure) European Training Centre or Combat Centre <p>Sub max three marks (function)</p> <ol style="list-style-type: none"> 6.(Function) Develop elite sport/athletes or achieve international sporting success 7.(Function) Provide world class facilities 8.(Function) Provide scientific or medical or nutritional services 9.(Function) Provide/ raise standard of elite coaching 10. (Function) Provide financial assistance to elite athletes or Sport Talent Encouragement Plan (STEP) 11. (Function) Talent ID programme 12. (Function) Develop (more integrated range of) pathways to elite level 13. (Function) provide educational programmes e.g. ACE 	5	<p>Sub max 3 for structure Sub max 3 for function</p> <p>Accept: NGBs for NSOs (pt 4)</p> <p>Develop excellence = vague</p>
2 (b)	<p>5 marks for 5 from:</p> <p>Sub max of four marks (Aus values)</p> <ol style="list-style-type: none"> 1. Bush culture/determination/courage/persistence are expected or are reflected in nature of many sports 2. Egalitarian society/lack of class system means all are treated equally in sport 3. Anti-discrimination/discrimination has been overcome so participation is available to all 4. Multi-culturalism/social melting pot means a mixture of cultures play sport together 5. Competitiveness drives participation in sport or winning is important 6. Fair play/sportsmanship is admired or is an important influence on participation 7. Team work is important and is reflected in many sports 	5	<p>Sub-max 4 for Aus values Sub-max 1 for UK comparison</p> <p>(SSU)Note: 'Land of the fair go' could be applied to point 2 or 3 but must be explained.</p>

	<p>8. (BAHL) Physical activity / lifelong participation is encouraged as important for health benefits</p> <p>9. Government values participation in sport so is involved in funding/policy making</p> <p>Sub max of one mark (UK)</p> <p>10.(Different) Bush culture or egalitarianism are (arguably) not values influencing mass participation in UK</p> <p>11. (Similar) Anti-discrimination/multi-culturalism/competitiveness/fair play/team work/health benefits/government involvement(Pts 3-9) - all have similar influence on mass participation in UK</p>		
2 (c)	<p>5 marks for 5 from:</p> <p>Sub max <i>three</i> marks (USA)</p> <ol style="list-style-type: none"> 1.Isolationist policy means sports are different (to those from UK)/ Marginalisation of UK/European sports or UK sports rejected by USA 2.Promotion of 'big four' sports or sports adapted/adopted/invented in USA 3.Frontierism/courage/toughness reflected in many sports 4.Decentralisation means USA Government not involved in funding/ organisation of sport 5.Hegemony/hierarchical nature of society reflected in sport/WASP domination 6.Pluralism impacts on range of cultures that are welcomed/tolerated in sport 7.American dream/land of opportunity/rags to riches reflect belief that anyone can achieve success in sport through hard work <p>Sub max three marks (UK)</p> <ol style="list-style-type: none"> 8.Impact of C19 public schools (on organisation/attitude to sport) 9.Melting pot/codification/development of NGBs or sports originated in the UK 10. Tradition of amateurism 11. Hierarchical nature of society/class system/impact of class on participation(less evident class system in USA) 12. Traditional values of fair play/participation/teamwork 13. (Rags to riches) not a predominant feature of sports development (in UK) 	5	<p>Sub-max 3 for USA</p> <p>Sub-max 3 for UK</p> <p>Lombardianism = vague</p>

2 (d)* Level Descriptors	Discriminators
<p>Level 4 (18-20 marks) A comprehensive answer:</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. 	<ul style="list-style-type: none"> • Excellent understanding of how USA College system promotes excellence • Detailed knowledge of pathways to excellence in UK • A range of comparisons are made between the College system in the USA and UK pathways • At the top end of this level there may be consideration and justification of reasons for differences between systems in USA and UK • At the bottom of this level all three areas of the question have been addressed with balance and many points have been developed
<p>Level 3 (13-17 marks) A competent answer:</p> <ul style="list-style-type: none"> • good knowledge and 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. 	<ul style="list-style-type: none"> • Good understanding of how USA College system promotes excellence • Good knowledge of pathways to excellence in UK • At the top of this level knowledge of UK pathways is likely to include an awareness that Institutes of Sport are often based at Universities • At the middle of this level knowledge of both USA and UK is developed with supporting points and there is an attempt to compare the systems • At the bottom of this level there may be good understanding of USA College system but a more limited knowledge of UK pathways with little development
<p>Level 2 (8-12 marks) A limited answer:</p> <ul style="list-style-type: none"> • limited knowledge and 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. 	<ul style="list-style-type: none"> • Limited understanding of how USA College system promotes excellence • Limited knowledge of pathways to excellence in UK. • At the top of this level knowledge of USA College system may be sound but description of UK pathways may be limited to a knowledge of UK Sport and academies with at least one attempt to compare them. • At the middle of this level knowledge of USA College system may be sound and knowledge of UK systems is basic, or there is limited knowledge of both • At the bottom of this level there may be some knowledge of USA College system and at least one pathway to excellence in UK has been described
<p>Level 1 (1 – 7 marks) A basic answer:</p> <ul style="list-style-type: none"> • basic knowledge and 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. 	<ul style="list-style-type: none"> • Basic knowledge of how USA College system promotes excellence • Little or no understanding of pathways to excellence in UK • At the top of this level some relevant points about USA College system have been made and one pathway to excellence in UK has been identified • At the middle of this level some valid and relevant points have been made
<p>[0 marks] No response or no response worthy of credit.</p>	

Question	Answer	Guidance
2 (d)*	<p>Indicative content: Candidate responses are likely to include: (relevant responses not listed should be acknowledged) <i>(Describe how the college system in the USA promotes sporting excellence and compare this system with the pathways to excellence which exist in the UK).</i></p>	
	<p>(College system in USA)</p> <ol style="list-style-type: none"> 1. Scholarships <ul style="list-style-type: none"> • Awarded to outstanding High School sports performers • Covers tuition fees/living expenses • Colleges are not allowed to pay athletes to play sport • Awarded through National Collegiate Athletic Association (NCAA) • Is a binding contract or performer must compete for College 2. Special admit/admission programmes <ul style="list-style-type: none"> • For elite performers who are not academically strong/do not meet standard entry grades • Validity/educational value of some courses questioned • Colleges lose scholarship funding (from NCAA) if 'admit' students don't make progress 3. Lombardianism is key value <ul style="list-style-type: none"> • Win ethic is instilled or perpetuated 4. Outstanding facilities <ul style="list-style-type: none"> • Facilities/stadia match those in the professional game 5. High number of spectators <ul style="list-style-type: none"> • Performers get used to performing in front of large crowds • Large gate receipts bring large sums of money 6. Specialist coaches <ul style="list-style-type: none"> • Coaches are highly paid which means very good coaches stay in college system • Hire and fire policy means coaches have high incentive to win 7. Athletic directors run sports faculty <ul style="list-style-type: none"> • Ensure accountability/maintain high standards of both students and coaches 8. Sport is run as a commercial business or is big business <ul style="list-style-type: none"> • Sport as entertainment (which attracts spectators) / cheerleaders / marching bands 	<p>KU = main points for USA or UK DEV – development of points Use highlighter for comparative points made</p>

	<ul style="list-style-type: none"> • Huge sums of money gained/retained by sports faculty • Finances used to develop/improve facilities/services • Alumni or local business sponsorship <p>9. High quality medical services</p> <ul style="list-style-type: none"> • Physiotherapy • Sports science support <p>10. High level of media coverage</p> <ul style="list-style-type: none"> • Many matches televised raising status • Broadcasting rights bring further funding <p>11. Competitions/matches mirror professional standards</p> <ul style="list-style-type: none"> • Instils professional standards • Students accustomed to pressure to perform <p>12. Athletes specialise in/commit to one sport</p> <ul style="list-style-type: none"> • Are expected to devote more time to sport than to study • About 50 hours per week <p>13. Draft/Pro-draft for best College performers</p> <ul style="list-style-type: none"> • To professional clubs • Only about 5% make it into 1st team <p>(UK pathways)</p> <p>14. UK Sport</p> <ul style="list-style-type: none"> • Focus on medal success in Olympics/Paralympics • World class performance pathways • Joint funded/funded by government and Lottery • Provides funding for most talented athletes <p>15. UK Sport Institute (UKSI)</p> <ul style="list-style-type: none"> • National institutes/EIS/WIS/SIS/SINI • Network of centres of excellence around country • Some centres based within Universities • Provide world-class facilities/services for elite performers 	
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	<p>16. National Governing Bodies (NGBs)</p> <ul style="list-style-type: none"> • Have overall responsibility for excellence in their sport • Select national teams • Organise competitions that encourage excellence <p>17. Schools (pathway)</p> <ul style="list-style-type: none"> • District to county to regional to national schools selection/trials at each stage • Traditional pathway arguably less significant today for many <p>18. Academies/club (pathway)</p> <ul style="list-style-type: none"> • Start at a very young age (in many sports) • High quality coaching/facilities <p>(Comparing USA College system with UK systems)</p> <p>19. (Pathways) UK has developed greater range of pathways</p> <ul style="list-style-type: none"> • USA College system has tradition of success/no need for other pathways • In UK drive for success/medals has dictated policy <p>20. (Universities) Some in UK are centres of excellence for sport</p> <ul style="list-style-type: none"> • E.g. Loughborough or Bath • UK unis also offer sports scholarships • UK unis also provide outstanding facilities/services • But UK unis do not attract large crowds <p>21. (Funding) Different funding sources in UK and USA</p> <ul style="list-style-type: none"> • USA private funding <u>and</u> UK a mix of Govt grants/lottery/private <p>22. (UK Sport) USA has no need for an equivalent body</p> <ul style="list-style-type: none"> • No state institutes in USA • No need for Talent ID/Sport Search or other initiatives <p>23. (Coaches) Different focus/ambitions/career paths of coaches</p> <ul style="list-style-type: none"> • In USA high salaries attract and retain top coaches in Colleges • In UK top coaches tend to coach national teams/higher salaries available 	
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	<p>24. (Win ethic) UK elite sport is moving towards a win ethic/lombardian ethic</p> <ul style="list-style-type: none">• In UK elite performers lose funding if performances drop <p>25. (Media/commercialism) Media does not cover University sport in UK</p> <ul style="list-style-type: none">• Media focus in UK is on top professional level sport• A few sports in UK dominate media coverage/funding• Boat race or Oxford v Cambridge rugby union is televised <p>26. (Draft) There is no draft system in UK sport</p> <ul style="list-style-type: none">• In UK transfer system exists/clubs can buy and sell players• Contracts bind performers to clubs as do College scholarships in USA	
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Section B – Sports Psychology

Question	Answer	Marks	Guidance
3 (a)	<p>Five marks for five from: Sub max four marks for:</p> <ol style="list-style-type: none"> 1. (Broad) Focus or concentrate on or takes into account a lot of information or uses peripheral vision/stimuli or has a wide perceptual field. 2. (External)....that is environmental or stimuli surrounding the performer. 3. (Narrow) Focus or concentrate on very few stimuli or concentrates on a small amount of information or specific cues 4. (Internal).... that involves their emotions or their own thoughts or concentrates on themselves or on strategies/tactics or uses cognition or past experiences. <p>Sub max one mark for practical example:</p> <ol style="list-style-type: none"> 5. (Narrow external example) E.g. A rugby player concentrating on a point beyond the rugby posts during a conversion. Or e.g. a netball player focussing on the goal net when shooting. 	5	<p>Accept only examples that are external</p> <p>Do not accept selective attention (pt 3)</p> <p>From within = vg (pt4)</p>

3 (b)	<p>Five marks for five from: Sub max three marks for characteristics:</p> <ol style="list-style-type: none"> 1. Good communication skills or can communicate effectively with teammates. 2. (Highly) motivated / enthusiastic/ persistence about the activity or about winning or is highly competitive in sport 3. Has a clear goal / vision about what is trying to be achieved in the sport or good at decision making or ambitious 4. Empathy / gets on well with team mates / can see others' points of view or has a good understanding of the needs of teammates in the sport. 5. Good at the sport themselves or has high level of personal sports ability or has been good at the sport in the past or is an ex-professional performer in the sport. 6. Has good knowledge/ experience of the sport or understands the sport and what needs to be done to be successful. 7. Is charismatic/motivational or has presence or commands respect / is influential with the players or individuals that are being led or leads by example or a role model 8. Has confidence 9. Flexible / adaptable in their approach <p>Sub max two marks for emergent/prescribed:</p> <ol style="list-style-type: none"> 10. (emergent) When the leader is selected/naturally arises from within the group/team or the group/team make the decision to select a particular member of the group as a leader. 11. (prescribed) When the leader is appointed/given from an outside agency/authority or the leader has been appointed outside the group or the group members do not influence the leader's appointment 	5	<p>Description of characteristics is required rather than a list of characteristics. Point 10 do not accept 'emerged' Point 11 do not accept is 'prescribed' (pt 11) Someone brought in = vague</p>
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3 (c)	<p>Five marks for five from:</p> <p>1. (Acceptance /belonging /group norms) To be accepted / behaviour can follow that of others or (group) norms/ pressure/conformity (to follow a dysfunctional/negative/unhealthy lifestyle)</p> <p>2. (values) The values of the group that are unhealthy may be adopted which may lead to negative lifestyle behaviour</p> <p>3. (negative – motivation) Can motivate / encourage group members to follow an unhealthy lifestyle or peer pressure / pressurise or losing motivation to be healthy</p> <p>4. (confidence/self-efficacy) Confidence /self-efficacy in not being healthy / being dysfunctional can be increased with the presence of others in the group or it may be decreased in following a healthy lifestyle (leading to social loafing) or losing confidence in being healthy</p> <p>5. (social loafing) Social loafers in a group or Individuals may influence others to become social loafers</p> <p>6. (aggression) Aggression may increase when in a group (showing dysfunctional behaviour.</p> <p>7. (deindividuation – loss of being an individual) Deindividuation or loss of sense of being an individual or lose sense of identity can occur when in a group which can lead to dysfunctional / anti-social / unhealthy behaviour or not feeling valued</p> <p>8. (able to identify with others) Increased sense of group identity can lead to negative lifestyle behaviour</p> <p>9. (prejudice or stereotyping) Being part of a group can make you more prejudiced against other individuals/groups or the prejudices / stereotypes against healthy behaviour is reinforced (In-group Out-group effect)</p> <p>10. (leaders) Leaders or role models in the group can influence/promote dysfunctional behaviour</p>	5	<ul style="list-style-type: none"> Answers must link group influences on unhealthy / dysfunctional behaviour.
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3. (d)* Level Descriptors	Discriminators
Level 4 (18-20 marks) A comprehensive answer: <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. 	<ul style="list-style-type: none"> Accurate and complete outline of Weiner's model. Most descriptive points about the model are developed and include examples for each of the model's variables. All dimensions of the model are excellently evaluated i.e. external/stable; external unstable; internal stable; internal unstable. Evaluation includes both positive and negative factors throughout. Practical examples are used extensively well to illustrate points.
Level 3 (13-17 marks) A competent answer: <ul style="list-style-type: none"> good knowledge and 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. 	<ul style="list-style-type: none"> Accurate and, at the top of this level, complete outline of Weiner's model. Many descriptive points about the model are developed and include some examples for the model's variables. At the top of this level, all dimensions of the model are evaluated i.e. external/stable; external unstable; internal stable; internal unstable. In the middle of this level at least two of the dimensions are evaluated. Evaluation includes both positive and negative factors. Practical examples are used well to illustrate points.
Level 2 (8-12 marks) A limited answer: <ul style="list-style-type: none"> limited knowledge and 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. 	<ul style="list-style-type: none"> Mostly accurate, but at the bottom of this level incomplete outline of Weiner's model. Some descriptive points about the model are developed and at the top of this level include some examples for the model's variables. At the middle of this level some attempt has been made to evaluate the model. Evaluation includes some positive and negative factors but much repetition of similar points. Practical examples are used well to illustrate points.
Level 1 (0 – 7 marks) A basic answer: <ul style="list-style-type: none"> basic knowledge and 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. 	<ul style="list-style-type: none"> The balance of the answer is weighted towards the outline rather than the evaluation. Mostly accurate outline at the top of this level. Some practical examples are used well at the top of this level Some descriptive points about the model included at the middle of this level. At the top of this level of this level some attempt has been made to evaluate the model. At the bottom of this level description (rather than evaluation) of attribution dominates the answer
[0 marks] No response or no response worthy of credit.	

Question	Answer	Guidance											
	<p>Indicative content: Candidate responses are likely to include: (relevant responses not listed should be acknowledged)</p> <p>Main points = knowledge / understanding</p> <p>Bullet points = likely to be development of knowledge and practical examples</p>	<p><i>If no practical examples then response cannot achieve higher than Level 1 (7 marks max)</i></p> <p><i>If no evaluation then response cannot achieve higher than Level 1 (7 marks max)</i></p>											
	<p>1 (Outline / description of model or appropriate diagram of model)</p> <p>Drawing or description of model (see guidance) that includes (labelled) locus of causality dimension.</p> <ul style="list-style-type: none"> • dimensions include external, internal, stable and unstable variables • Examples shown for each variable. • Link between attribution and motivation (causal attribution) or equiv model (see guidance). • Reference to (the later addition to the model of) Locus of Control (controllable and uncontrollable) <p>(More detail of model)</p> <p>2 (Stability) Stable factors are unchanging/constant and unstable factors are changeable (over the short term).</p> <ul style="list-style-type: none"> • e.g. (Ability) - How able you are in athletics is stable • but (Effort) the effort you put into a race is unstable. <p>E.g. (Task difficulty) – How good the opposition are is stable (over the course of the game)</p> <ul style="list-style-type: none"> • But (Luck) – Luck is unstable because it is changeable <p>3 (Locus of causality) External factors are environmental and internal factors are dispositional/to do with individuals or the team (rather than the environment).</p> <ul style="list-style-type: none"> • e.g. The state of the football pitch is an external factor and your physical fitness is an internal factor. <p>4 (Locus of Control) – give credit for this info on additional aspect of model</p> <ul style="list-style-type: none"> • Controllable factors are when someone has the capability to influence the outcome of a task or behaviour • Uncontrollable factors are when no one has the capability to influence the outcome of a task or behaviour <p>e.g. An unlucky goal/slippy pitch in football is uncontrollable and playing zone defence in basketball as a tactic is controllable</p>	<p>Weiner's Model should resemble:</p> <table border="1"> <tr> <td colspan="3" style="text-align: center;"><i>Locus of Causality</i></td></tr> <tr> <td colspan="2"></td><td style="text-align: center;">Internal External</td></tr> <tr> <td rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">Locus of Stability</td><td style="text-align: center;">Stable</td><td style="text-align: center;">Ability Task Difficulty</td></tr> <tr> <td style="text-align: center;">Unstable</td><td style="text-align: center;">Effort Luck</td></tr> </table> <p>Causal attribution model example - accept link between perceived causes or attributions and motivation /expectancy (does not have to be a copy of the model below):</p> <div style="text-align: center;"> <p>ANTECEDENTS ATTRIBUTIONS CONSEQUENCES</p> <p>ATtribution THEORIES ATTRIBUTIONAL THEORIES</p> <p><small>Figure 1 General model of the attribution field.</small></p> </div> <p>If no practical examples then response cannot achieve higher than Level 1 (7 marks max)</p> <p>If no evaluation then response cannot achieve higher than Level 1 (7 marks max)</p>	<i>Locus of Causality</i>					Internal External	Locus of Stability	Stable	Ability Task Difficulty	Unstable	Effort Luck
<i>Locus of Causality</i>													
		Internal External											
Locus of Stability	Stable	Ability Task Difficulty											
	Unstable	Effort Luck											

(Luck / task difficulty)

5 Giving external reasons/attributions for failure could be used to keep up morale / motivation (+)

- Because of increased/self-confidence / retain pride (+)
- Self-serving bias – protecting self esteem (+)
- Keep team cohesive or no-one is to blame (+)
- May lead to different tactics being adopted (+)
- Prevent learned helplessness (+)
- Can be used for beginners /NAf (+)
- But could shield other more real reasons (-)
- Could lead to lack of improvement (-)
- Not beneficial for experts/NACH (-)

6 Giving external reasons/attributions for success can reduce motivation (-)

- Because self confidence / pride isn't increased (cause of success is not the performer) (-)
- Typically used by Naf (-)
- Although shame / embarrassment is minimised (+)
- Could lead to lack of improvement (-)

(Effort / ability)

7 Giving internal reasons for failure could be to motivate to try harder (+)

- Different training methods adopted (+)
- High fitness levels worked for (+)
- Could lead to trying to reach mastery orientation (+)
- Beneficial for an expert/elite/NACH performer (+)
- But could dispirit performer / lower morale/self confidence (-)
- Might lead to learned helplessness (don't credit twice) (-)
- Particularly in beginners/NAF performers (-)
- Individuals might fall out causing hostility / disruption (-)

8 Giving internal reasons/attributions for success can increase motivation (+)

- Because it raises self confidence and pride (+)
- Results in mastery orientation (+)
- Typically used by Nach (+)
- Or demotivate if become complacent (-)

(Effort / luck)	(Ability/ task difficulty)
<p>9 Giving unstable reasons for failure could also be used to keep up morale / motivation</p> <ul style="list-style-type: none"> • gives belief the outcome could change (+) • Self-serving bias – protecting self esteem (+) (don't credit twice) • Can prevent learned helplessness / promote mastery orientation(+) • Typically used by Nach (+) • Different training methods adopted (+) • But could shield other real reasons(-) • Could lead to lack of improvement (-) <p>10 Giving unstable reasons for success Could reduce motivation (-)</p> <ul style="list-style-type: none"> • Because the outcome can change (-) • could raise motivation because the outcome could change next time(+) • Can lead to further improvements (+) 	<p>11 Giving stable reasons for failure could result in lower motivation (-)</p> <ul style="list-style-type: none"> • expect failure to be repeated in future (-) • could cause Learned helplessness (-) • Typically used by Naf (-) <p>12 Giving stable reasons for success could result in high motivation (+)</p> <ul style="list-style-type: none"> • Expect success to be repeated in future (+) • Can cause Mastery orientation • Unless become complacent and motivation could drop (-)
<p>13 Giving Controllable reasons for success or failure can motivate a performer</p> <ul style="list-style-type: none"> • Because something purposeful/planned was done (or can be changed) (+) • Can lead to Mastery Orientation (+) 	<p>14 Giving Uncontrollable reasons for success or failure can demotivate a performer</p> <ul style="list-style-type: none"> • (failure) because it doesn't give hope that the athlete can do something about the outcome (-) • (success) because it suggests the win was a result of unplanned and nothing to do with the athlete (-) • Can lead to learned helplessness(-)

15 (General) Internal unstable / controllable attributions usually better to motivate team members

- This helps to avoid learned helplessness or to avoid a drop in individual/team motivation
- Provided they are not beginners/NAF whereby External stable attributions can be better
-

16 (General) Theory is too generalised or the model's variables are unrealistic

- Task difficulty for example might be classified as stable(during the game) or unstable (between games)
- Ability is classified as stable but this can be modified / built upon / improved and could therefore be seen as unstable
- Developed point
e.g. Example

17 (General) Different types of performer can influence whether attributions motivate or de-motivate

- with different types of personality e.g. Type A or Type B

whether they are a Nach or a Naf

Section B – Biomechanics

Question	Answer	Marks	Guidance
4 (a)	<p>(i) Two marks for two from:</p> <ol style="list-style-type: none"> Angular accn ($\ddot{\omega}$) = change in angular velocity(ω) /time Or $\ddot{\omega} = 15 - 5/0.2$ Or $\ddot{\omega} = 10/0.2$ 50 rads s⁻² or 50 rad/s/s (units must be correct) <p>(ii) Three marks for three from Trampolinist reduces Moment of Inertia / MI</p> <ol style="list-style-type: none"> Trampolinist redistributes mass closer to axis of rotation Trampolinist's body position becomes more tucked Law of Conservation of Angular Momentum / Analogue of Newton's First Law of Motion A body will rotate with constant angular momentum unless acted upon by an external torque. AM = Moment of Inertia x angular velocity / AM = $I\omega$ 	5	

(b)	<p>Five marks for five from</p> <ol style="list-style-type: none"> 1. Javelin is/adopts an aerofoil shape 2. Takes an (appropriate) angle of attack (to the direction of motion)/ 17° 3. Means air travels further over the top of the javelin 4. Therefore air travels faster over the top of the javelin 5. This creates a low pressure area on top of the javelin 6. This creates a high to low pressure gradient / pressure gradient or differential 7. This creates a lift force acting on the javelin 8. (Bernoulli) lift force decreases the effect of weight / gravity 9. Flight path (becomes more) non-parabolic 10. $AR > W$ or $AR > W - \text{lift force}$ 11. Javelin can travel further or increases time in air. 	5	<ul style="list-style-type: none"> • Points 3-5 accept opposites
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(c)	<p>Five marks for five from:</p> <ol style="list-style-type: none">1. Creating smooth flow / reducing drag / fluid friction / water/ air resistance around the swimmer/ performer2. Reducing drag / turbulence BEHIND swimmer/ performer.3. Smoother surface of swimmer by shaving / special swimwear / hats.4. Reducing <u>frontal/ forward</u> x-sectional area / flatter body position.5. Swimming underwater / reducing wave drag / surface effects.6. Dolphin action.	5	<p>Friction on its own (pt 1)= too vague</p> <p>Tight swimwear = vague</p>
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(d)* Level Descriptors	Discriminators
<p>Level 4 (18-20 marks) A comprehensive answer:</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. 	<ul style="list-style-type: none"> • Detailed application of Newton's Laws of Motion to the high jumper at take-off. • Accurate FBD and description of the effect of weight and air resistance on the FP • Excellent understanding of the concept of centre of mass and its use in the Fosbury Flop • Detailed understanding of impulse and its application to safe • All aspects of the question are successfully addressed
<p>Level 3 (13-17 marks) A competent answer: good knowledge and clear understanding</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Good application of Newton's Laws of Motion to the high jumper at take-off. • Clear FBD and good description of the effect of weight and air resistance on the FP • Good understanding of the concept of centre of mass and its use in the Fosbury Flop • Good understanding of impulse and its application to safe • At the top of this level most aspects of the question are successfully addressed • In the middle of this level most aspects of the question are addressed • At the bottom of this level an aspect of the question may not have been addressed
<p>Level 2 (8-12 marks) A limited answer:</p> <ul style="list-style-type: none"> • limited knowledge and 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. 	<ul style="list-style-type: none"> • Some knowledge of Newton's Laws of Motion but not necessarily well applied to the high jumper at take-off. • A reasonable attempt at a FBD and description of the effect of weight and air resistance on the FP • Some knowledge of the concept of centre of mass and its use in the Fosbury Flop • Limited understanding of impulse and its application to safe • Some aspects of the question are successfully addressed to reach the top of this level • In the middle of this level some aspects of the question are addressed • At the bottom of this level some aspects of the question may not have been addressed

<p>Level 1 (1 – 7 marks) A basic answer:</p> <ul style="list-style-type: none"> • basic knowledge and 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. 	<ul style="list-style-type: none"> • Basic knowledge Newton's Laws of Motion • Inaccurate FBD and limited description of the effect of weight and air resistance on the FP • Limited acknowledgement of the role of centre of mass and its use in the Fosbury Flop • No aspects of the question are successfully addressed • Some aspects of the question are addressed to reach the top of this level • In the middle of this level some knowledge of Newton's Laws and flight paths may be shown • At the bottom of this level some knowledge of either Newton's Laws or flight paths may be shown
<p>[0 marks] No response or no response worthy of credit.</p>	

Question	Answer	Guidance
(d)*	<p>Indicative content: Candidate responses are likely to include: (relevant responses not listed should be acknowledged)</p> <p>Numbered points = knowledge / understanding</p> <p>Bullet points = likely to be development of knowledge</p>	
	<p>Using Newton's Laws of Motion, explain the effects of the resultant vertical force acting on a high jumper at take-off.</p> <p>1. (Newton 1) The high jumper will remain on the floor unless an external (upward) force acts on him</p> <ul style="list-style-type: none"> ▪ Reaction force greater than weight/ $R > W$ ▪ Net force positive/ unbalanced vertical forces ▪ Resultant force upwards acting on high jumper <p>2. (Newton 2) The (upwards) acceleration of the high jumper is directly proportional to the resultant force acting on him (and acts in the same direction)</p> <ul style="list-style-type: none"> ▪ The greater the resultant/reaction force the greater (upwards) acceleration/_momentum generated ▪ The greater the resultant/reaction force the greater the height achieved <p>3. (Newton 3) The high jumper applies a (action) force downwards into the ground</p> <ul style="list-style-type: none"> ▪ And the ground applies an equal reaction force upwards onto the high jumper <p>Sketch a free body diagram showing the forces acting on a high jumper during flight and describe their effect on the flight path.</p> <p>4. (FBD) Weight acting downwards</p> <ul style="list-style-type: none"> ▪ From the CM <p>5. (FBD) Air resistance acting opposite direction of motion</p> <ul style="list-style-type: none"> ▪ From CM/ or end of the body ▪ Smaller than weight 	

6. (Flight path) High jumper follows a (nearly) parabolic / symmetrical flight path

7. (Flight path) Weight is the dominant force/ $W > AR$

- As high jumper has a large mass

8. (Flight path) Air resistance is negligible

- As high jumper is moving (relatively) slowly

Explain why the Fosbury Flop is the preferred technique for modern day high jumpers.

9. (Fosbury Flop) Centre of mass is the point at which the body is balanced in all directions

- Is the point at which weight acts

10. (Fosbury Flop) Position of CM depends on the distribution of mass of high jumper

- Change in body shape changes position of CM

11. (Fosbury Flop) High jumper arches/hyperextends back during flight

- CM lies outside body/ underneath the back
- High jumper passes over bar whilst CM passes underneath

12. (Fosbury Flop) CM follows predetermined flight path / height that CM reaches predetermined at take-off

- Means other techniques / CM stays within body
- CM has to pass over the bar

..... and how the use of the safety bed has influenced this preference.

13. (Landing) Impulse = force x time / change in momentum

- Therefore safety bed applies an impulse to decrease the momentum of the high jumper

14. (Landing) Safety bed increases time that it takes to stop high jumper

- Therefore increases time that forces act on high jumper

15. (Landing) Forces acting on body are significantly decreased

- Reduces risk of injury
- Technique changed as landing became safer/ scissor kick into sand/ western roll onto mats/ fosbury flop onto safety bed

Exercise and Sport Physiology (Option B3)

Question	Answer	Marks	Guidance
5 (a)	<p>Sub max 3 marks for 3 from:</p> <ol style="list-style-type: none"> 1. (Energy) The ability/<i>capacity</i> to perform work/ put mass into motion 2. (Work) Work is done when a force is applied to a body to move it over a certain distance or work = force (N) x distance moved (m) 3. (Power) Rate at which work can be done or power=work/time or speed x strength <p>Sub max 2 marks for 2 from:</p> <ol style="list-style-type: none"> 4. High energy compound / molecule / (stored within our muscles) or potential/ (stored energy for muscular contraction) 5. Only immediate/ usable source of energy in the body or energy currency/ ATP stores can provide energy for first few secs 6. ATP breakdown releases energy or ATP gives ADP+P+Energy or high energy bonds release energy when broken 7. ATP can be resynthesised 	5	Accept pt 3- speed at which work can be done (BOD)

5(b)	<p>5 marks for 5 from:</p> <ol style="list-style-type: none"> 1. Respiration/ breathing rate remains elevated/ excess post-exercise oxygen consumption (EPOC) or heart rate remains elevated 2. Alactacid or fast/ rapid stage of recovery 3. Restores the PC stores depleted during exercise 4. Endothermic / coupled reactions 5. is made available by the aerobic breakdown of fats and carbohydrate or uses aerobic system 6. The alactacid component takes between two and three minutes for full recovery or it takes approximately 30 seconds to resynthesise 50% of PC stores/ 75 % in 60 seconds. 7. and uses up to 3-4 litres of oxygen 8. During this component the myoglobin stores are replenished with oxygen or restoration of oxy-myoglobin link 9. Elevated respiration aids removal of CO₂ 10. Lactacid debt or slow stage of recovery. 11. Removal of lactic acid 	5	Do not accept alactic stage
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5(c)	<p>5 marks for 5 from:</p> <p>Sub max 1 for definition</p> <p>Maximum force that the neuromuscular system can exert in a single muscle contraction Or the maximal weight that an individual can lift just once (1RM) Or the greatest force that is possible in a single maximum contraction</p> <p>Sub max 4 for adaptations</p> <ol style="list-style-type: none"> 1. Muscle hypertrophy or increase in muscle mass or hyperplasia / muscle cells splitting / more fast twitch muscle fibres 2. Increased concentration /stores of PC / ATP 3. Increased glycogen stores 4. Increased tolerance to lactic acid / buffering 5. Less lactic acid produced for the same workload / delayed OBLA 6. Increase in levels of glycolytic enzymes 7. Increased efficiency to remove lactic acid 8. Increased anaerobic threshold/ capacity/ of ATP/PC/ LA system 9. Recruitment of additional motor units 10. Reduced/delayed autogenic inhibition or reduced/delayed activation of golgi tendon organs 11. Improved coordination 12. Increased strength of connective tissues/ tendons/ ligaments/ bones 13. Cardiac hypertrophy/ hypertrophy of the heart 	5	
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5 (d)* Level Descriptors	Discriminators
<p>Level 4 (18-20 marks) A comprehensive answer:</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. 	<ul style="list-style-type: none"> • detailed knowledge and critical evaluation of all three energy systems • excellent explanation of a range of factors that would affect which energy system is used, supported with a range of relevant practical examples • At the top of this level there is a clear understanding of the interaction between the three energy systems and of the energy continuum and thresholds. • At the bottom of this level answers should show excellent knowledge and critical evaluation (positive and negative) of all three energy systems and an understanding of their use in relation to a football player, but examples may not show the interaction between energy systems
<p>Level 3 (13-17 marks) A competent answer:</p> <ul style="list-style-type: none"> • good knowledge and 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. 	<ul style="list-style-type: none"> • good knowledge and understanding and critical evaluation of energy systems • clear explanation of some of the factors affecting when each energy system is used. • At the top of this level there may be positive and negative evaluations of at least two energy systems, and additional factors, as well as intensity and duration have been explained. • At the bottom of this level there should be a good knowledge of energy systems and there will be some attempt to critically evaluate at least one of the systems. Intensity and duration should be used to explain when at least two systems are used • some use of practical examples from football should be used.
<p>Level 2 (8-12 marks) A limited answer:</p> <ul style="list-style-type: none"> • limited knowledge and 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. 	<ul style="list-style-type: none"> • A limited understanding of the energy systems together with some evidence of critical evaluation, or a good understanding of energy systems without critical evaluation.. • Description, rather than explanation of the effect of intensity and duration on the use of different energy systems in relation to a footballer player. • There may be identification of one of two other factors that would affect which energy system is used. • At the top of this level there may be a detailed description of the energy systems and reference to intensity and duration, but a lack of critical

	<p>evaluation or a lack of practical examples to support the answer.</p> <ul style="list-style-type: none"> At the bottom of this level there may be limited knowledge of two of the energy systems, and a couple of factors may be described with reference to a footballer
<p>Level 1 (1 – 7 marks) A basic answer:</p> <ul style="list-style-type: none"> basic knowledge and 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. 	<ul style="list-style-type: none"> basic knowledge of the energy systems Little, or no attempt to critically evaluate these systems Reference may be made to anaerobic rather than using system names. basic reference to the factors that determine use of energy systems in relation to a footballer player. At the top of this level two energy systems may be described but with errors and there may be one factor described that determines which energy system is used by a footballer. At the bottom of this level answers may identify one energy system or may identify one factor affecting when an energy system is used.
[0 marks] No response or no response worthy of credit.	

Question	Answer	Guidance
5(d)*	<p>Indicative content: Candidate responses are likely to include: (relevant responses not listed should be acknowledged)</p> <p>Numbered points = knowledge / understanding</p> <p>Bullet points = likely to be development of knowledge</p>	
	<p>1. ATP is the only useable source of energy in the body/ energy currency of the body</p> <ul style="list-style-type: none"> • stores last up to 2 seconds/ 1 maximal contraction • enzyme ATPase breaks down ATP to release energy • high energy bonds between the adenosine and phosphate elements <p>(ATP/ PC System)</p> <p>2. ATP can be resynthesised via ATP/PC system/alactic system/PC system</p> <ul style="list-style-type: none"> • involves coupled reactions • PC is broken down into P + C + energy • Energy released + ADP + P --> ATP • Site = muscle cell sarcoplasm • Enzyme = creatine kinase • Increase in ADP stimulates release of enzyme creatine kinase <p>3. A football player would use this system to resynthesise ATP when working at high intensity for under 10 seconds</p> <ul style="list-style-type: none"> • Examples could include sprinting for ball, jumping for header, kicking ball to clear <p>4. An advantage of this system is that there are no fatiguing by products produced</p> <ul style="list-style-type: none"> • allows for the quick re synthesis of ATP/ few reactions • doesn't need oxygen or no delay for oxygen • PC can be quickly re synthesised (so recovery is quick)/ • 50% recovery in 30 seconds/100% recovery in 180 seconds • PC is readily available in the muscle <p>5. A disadvantage of this system is that only small amounts of fuel is stored in the muscle cell (PC)</p> <ul style="list-style-type: none"> • low energy yield/only 1 ATP re synthesised • can only provide energy for short period of time/2-10 seconds 	

	<p>(Lactic Acid/ LA system)</p> <p>6. ATP can be resynthesised via Lactic Acid system/lactacid system/anaerobic glycolysis</p> <ul style="list-style-type: none"> • Glucose is (partially) broken down into pyruvic acid • by the enzyme phosphofructokinase (PFK) • This is further broken down into lactic acid • by the enzyme lactate dehydrogenase (LDH) • Site= muscle cell sarcoplasm • Glucose is stored as glycogen • Glycogen is broken down by the enzyme glycogen phosphorylase (GPP) into glucose • Drop/decrease in PC stimulates release of PFK/GPP <p>7. A football player would use this system to resynthesise ATP when working at high intensity for up to 10 sec- 2mins</p> <ul style="list-style-type: none"> • Examples could include chasing a through ball a number of times or racing down the wing and tracking back <p>8. An advantage of this system is that there is a large potential fuel store of glycogen available (stored in muscles and liver)</p> <ul style="list-style-type: none"> • requires few reactions • can work anaerobically/in the absence of oxygen/no delay for oxygen • can provide energy quickly/faster/quicker (than the aerobic energy system) • makes 2 moles of ATP or more ATP than ATP/ PC system <p>9. A disadvantage of this system is that it produces the by-product lactic acid</p> <ul style="list-style-type: none"> • Causes fatigue • reduces pH/inhibits enzyme action • stimulates pain receptors • (relatively) low yield of ATP (in comparison to aerobic system) • longer recovery • not as quick as ATP/ PC system 	
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	<p>(Aerobic system)</p> <p>10. ATP can be resynthesised via Aerobic system/oxidative system</p> <ul style="list-style-type: none"> • Has 3 stages/stage 1 = aerobic glycolysis/stage 2 = Krebs cycle/stage 3 = electron transport chain (ETC) • Stage 1 site = muscle cell sarcoplasm. Glucose is broken down into pyruvic acid. This combines with coenzyme A to form Acetyl CoA • Stage 2 site = matrix of the mitochondria. Carbon Dioxide is produced. Hydrogen atoms are removed (oxidised). Use/breakdown of fats/FFAs • Stage 3 site = cristae of the mitochondria. Hydrogen atoms combine with NAD & FAD. Carried along the ETC. Hydrogen electron splits from the hydrogen atom and combines with oxygen to form water <p>11. A football player would use this system to resynthesise ATP when working at low/ moderate intensity</p> <ul style="list-style-type: none"> • Examples could include jogging back into position, recovery phase <p>12. An advantage of this system is that it has a large energy yield of ATP/34-38 ATP</p> <ul style="list-style-type: none"> • 2 in anaerobic glycolysis, 2 in Krebs cycle/32-34 in the electron transport chain • Large potential stores of glycogen and FFAs • no fatiguing by-products are produced/carbon dioxide & water easily removed • able to work for long periods of time • fats can also be used / provide more energy <p>13. A disadvantage of this system is that it is a slower rate of ATP resynthesis</p> <ul style="list-style-type: none"> • cannot instantly resynthesise ATP at start of exercise due to delay of oxygen from the CV system therefore using another system is essential • requires more oxygen/15% more to break down free fatty acids (FFEs's)/fats • more complex series of reactions/aerobic glycolysis & Krebs cycle & electron transport chain • not suitable for high intensity, short duration work. 	
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	<p>(Factors affecting which energy system is used)</p> <p>14. A footballer would use all three energy systems during a game/ energy continuum</p> <ul style="list-style-type: none"> • Due to the different intensity of the activity within the game • Due to the different duration of specific activities within the game <p>15. The systems do not work in isolation/they interact to resynthesise ATP</p> <ul style="list-style-type: none"> • energy system thresholds/the point at which one system is taken over by another as the predominant system • exercise intensity and duration of the activity being undertaken will affect which energy system is predominant <p>16. The fitness/amount of training done will affect which system is used</p> <ul style="list-style-type: none"> • Anaerobic training means ATP/PC/lactate thresholds/OBLA delayed • Due to increased stores of ATP/PC/glycogen • Increased tolerance to lactic acid • Aerobic training means more efficient CV and respiratory systems/ can use FFAs earlier <p>17. Availability of oxygen will affect which system is used</p> <ul style="list-style-type: none"> • If oxygen is available then aerobic system will be used • If oxygen is not available then the LA system/ATP/C system is used <p>18. The fuel available will determine which energy system is in use</p> <ul style="list-style-type: none"> • If there are sufficient PC stores then the ATP/PC energy system • PC stores depleted then glycogen is used/lactic acid system is used • If glycogen is present then the aerobic system will be the predominant system if the exercise is of moderate intensity (oxygen is also required) • The greater the liver/muscle glycogen stores the longer the aerobic system can be the predominant system (even at a higher intensity exercise) • As the duration of the exercise continues there is a greater breakdown of fats/ fatty free acids. This requires more oxygen therefore if fats are the available fuel then the aerobic system would be the predominant energy system <p>19. Importance of game/state of game/tactics used may affect which system is predominant</p> <ul style="list-style-type: none"> • E.g. Cup final players may work at higher intensity/more anaerobic 	
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	<ul style="list-style-type: none">• E.g If 1-0 down with 10 minutes to play in cup match intensity will be higher/more anaerobic• E.g. Winning 5-0 or against poor opposition intensity may drop/more aerobic• E.g. high tempo/pressing style means more anaerobic.	
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