



---

# **GCE A LEVEL MARKING SCHEME**

---

**SUMMER 2018**

**A LEVEL (NEW)  
PHYSICAL EDUCATION - COMPONENT 1  
A550U10-1**

## **INTRODUCTION**

This marking scheme was used by WJEC for the 2018 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

**GCE A LEVEL PHYSICAL EDUCATION**

**SUMMER 2018 MARK SCHEME**

Question	Mark scheme	AO1	AO2	AO3	Total
1. (a)	<p><b>Which of the following is not a strategy for reducing social loafing?</b></p> <p>Tick <b>one</b> box only, either answer acceptable:</p> <p>C: Setting challenging goals E: Involving all players in goal setting</p>	1			1
1. (b)	<p><b>Using appropriate theories, explain how playing at home may affect a team's performance.</b></p> <p><b>Maximum of 2 marks without theories</b></p> <p><b>Maximum of 3 marks if only 1 theory</b></p> <p><b>Theories (<i>max. 2 marks for understanding of</i>)</b></p> <ul style="list-style-type: none"> <li>• Social facilitation is the notion that the presence of others (an 'audience') will affect performance.</li> <li>• Zajonc – drive theory of social facilitation. Presence of others creates arousal.</li> <li>• Cottrell - Evaluation Apprehension theory</li> <li>• Baron - Distraction-Conflict theory</li> <li>• Homefield advantage.</li> </ul> <p><b>Positive effects of audience - social facilitation (<i>max. 2 marks for application</i>)</b></p> <ul style="list-style-type: none"> <li>• Increased drive leads to improved performance when skill has been mastered (the 'dominant response') or is relatively simple. Extroverts tend to perform better in the presence of an audience.</li> </ul> <p><b>Negative effect of audience - social inhibition (<i>max. 2 marks for application</i>).</b></p> <ul style="list-style-type: none"> <li>• Increased drive might lead to impaired performance if the skill is difficult/complex or performer is a beginner. Introverts tend to perform worse in the presence of an audience. Anxiety may be linked to evaluation apprehension (the idea of being judged).</li> <li>• Specific examples must be used to access full marks.</li> <li>• No credit should not be awarded for responses that do not refer to appropriate named theories.</li> </ul>	2	2		4

Question	Mark scheme	AO1	AO2	AO3	Total
1. (c)	<p><b>Describe the main characteristics of these styles and explain where each style may be effectively used in sporting situations</b></p> <p><b>Max 3 marks for knowledge</b> <b>Max 3 for application</b></p> <p><b>Must comment on all three to achieve 6 marks</b></p> <ul style="list-style-type: none"> <li>• <b>Autocratic:</b> authoritarian / strong discipline / tend to be inflexible / usually task-orientated / makes all or the vast majority of the decisions / does not ask player for opinions / impersonal</li> <li>• Best employed when the leader needs to make decisions quickly and when conditions are most or least favourable (Fiedler). Useful when clear goals need to be set and outcomes monitored. Good for getting individually to engage and work hard.</li> <li>• <b>Democratic:</b> cooperative approach / encourages the involvement of other members of the group / listens to opinions / leader uses information garnered to make final decision.</li> <li>• Best employed in moderately favourable conditions (Fiedler) and when decisions do not need to be taken quickly. Good for encouraging independent thought from players; particularly useful for individual sports where a dialogue-based approach to coaching can be employed. Good for fostering cooperative and for motivating players.</li> <li>• <b>Laissez-faire:</b> passive role / generally lets the group members get on with the task themselves / no decision making / acts more as a consultant but do not direct goals.</li> <li>• Limited use within sporting contexts / could be employed where sport is used for recreational purposes. Often little outcome from this style in terms of end result.</li> <li>• Can be opposite of above but this is determined by the learner</li> </ul> <p>Amplification in relation to:</p> <ul style="list-style-type: none"> <li>• size of group</li> <li>• personality</li> <li>• type of learner</li> <li>• danger</li> <li>• duration of activity</li> </ul>	3	3		6

Question	Mark scheme	AO1	AO2	AO3	Total
1. (d)	<p><b>Explain how social learning theory can be used to explain the behaviour of young players within sport.</b></p> <p><i>1 mark for explanation of social learning theory 2 marks for application to explain behaviour with appropriate examples</i></p> <ul style="list-style-type: none"> <li>• Social learning theory suggests that behaviour is determined by an individual's situation.</li> <li>• It suggests that we learn through two types of experience - observational learning (modelling of significant others) and social reinforcement.</li> <li>• Young athletes are likely to copy significant others such as sporting role models and copy/imitate their behaviour (both positive and negative) eg. young athletes can learn to be aggressive by watching the actions of others</li> <li>• If behaviour is then rewarded (through social reinforcement eg. praise from coach), then behaviour is more likely to be repeated.</li> <li>• DARMMM</li> </ul>	1	2		3

Question	Mark scheme	AO1	AO2	AO3	Total
1. (e)	<p><b>Explain how a coach might use cognitive dissonance to change a player's negative attitude towards training.</b></p> <p><i>Up to 2 marks for understanding of how to apply the theory of cognitive dissonance from points below:</i></p> <ul style="list-style-type: none"> <li>cognitive dissonance attempts to create conflict (psychological discomfort) in one or more attitude components (triadic model - Cognitive, Affective, Behavioural)</li> <li>the idea is that this conflict will make the player feel uneasy due to the lack of harmony and this will cause them to change their attitude.</li> <li>a mismatch in the cognitive/affective/behavioural elements will cause a dissonance (imbalance) in the mind of the person being persuaded due to the introduction of new information affecting the cognitive (belief) or affective (emotional) component. The only way to reduce this imbalance is to change their behaviour.</li> </ul> <p><i>Additional 1 mark for using example to illustrate understanding:</i></p> <ul style="list-style-type: none"> <li>eg. the coach could provide new information/educate player about the benefits of training (cognitive)</li> <li>eg. the coach could create new emotions/enjoyment/fun by making varying training (affective)</li> <li>eg. the coach could provide early success or use rewards / reinforcement (behavioural)</li> </ul>	1	2		3
1. (f)	<p><b>Explain, using sporting examples, the difference between trait and state anxiety.</b></p> <p><i>Award 2 marks for explanation of difference between trait and state anxiety and 1 mark for use of appropriate examples.</i></p> <ul style="list-style-type: none"> <li>Trait anxiety is enduring (a personality trait). People with high trait anxiety will become anxious even in non-threatening situations eg. playing in a pre-season friendly game.</li> <li>State anxiety is a temporary emotional state. It is a response to a particular situation which may be seen as a threat eg. taking a penalty kick during cup final in the final minutes to win the game.</li> </ul>		3		3

Question	Mark scheme	AO1	AO2	AO3	Total
2. (a)	<p><b>The volley within a game of tennis can be classified as:</b></p> <p>Tick <b>one</b> box only.</p> <p><i>Award one mark for:</i></p> <p>D:     Open, discrete and complex skill</p>	1			1
2. (b)	<p><b>Using a sport example, describe what is meant by retroactive transfer of learning.</b></p> <p><i>Award 1 mark for knowledge of retroactive transfer.</i></p> <ul style="list-style-type: none"> <li>• Retroactive transfer of learning occurs when a skill/task currently being learnt has an effect on previously learnt skills/tasks. It can be positive or negative.</li> </ul> <p><i>Award 1 mark for application to sport.</i></p> <ul style="list-style-type: none"> <li>• For example, when learning a tennis serve, there may be retroactive transfer to the previously learnt skill of overarm volleyball serve as the actions e.g. follow-through are similar.</li> </ul>	2			2
2. (c)	<p><b>Explain, using Figure 1, the psychological refractory period.</b></p> <p><i>Award 1 mark for knowledge of PRP.</i></p> <p>The psychological refractory period is the delay in being able to respond to the second of two closely spaced stimuli. It is often associated with dummies or disguised shots with sport.</p> <p><i>Award up to 2 marks for application of PRP.</i></p> <p>In the rugby dummy example, the opponent will respond to the first movement (dummy - first stimulus). As the opponent processes this information and prepares to initiate a response (ie. movement to make a tackle), the attacker moves off in the opposite direction (second stimulus). The opponent will then experience a delay (the PRP) before being able to react to the presentation of the second stimulus.</p> <p>Hicks law – number of stimuli increases response time</p>	1	2		3

Question	Mark scheme	AO1	AO2	AO3	Total
2. (d)	<p><b>Outline two strategies for improving long-term memory.</b></p> <p><i>Award 2 marks for any of the following points:</i></p> <ul style="list-style-type: none"> <li>• Use of imagery / mental rehearsal.</li> <li>• Use of chunking (group information together)</li> <li>• Continued practice / reinforcement.</li> <li>• Association with previous experiences (recognition)</li> <li>• Make stimulus more intense.</li> <li>• Meaningful/memorable</li> </ul>	2			2
2. (e)	<p><b>Using sporting examples, explain the difference between a low organisation and high organisation skill.</b></p> <p><i>Award 1 mark for knowledge of difference between high and low organisation and award 1 mark for application.</i></p> <ul style="list-style-type: none"> <li>• Low organisation skills: where sub-routines can be easily distinguished. Consequently, these sub-routines can be practice is isolation e.g. gymnastics routine where different aspects of the sequence such as a forward roll can be practiced separately.</li> <li>• High organisation skills: difficult to break down into separate sub routines. These skills tend to have to be practised as a whole e.g. cycling.</li> </ul>		2		2



Question	Mark scheme	AO1	AO2	AO3	Total
2. (f)	<p><b>Explain how reinforcement can be used to strengthen or weaken the stimulus-response bond when learning new skills.</b></p> <p><i>Award up to 1 marks for knowledge of different forms of reinforcement and up to 3 marks for application</i></p> <ul style="list-style-type: none"> <li>• Positive reinforcement involves offering rewards (tangible/intangible). It usually comes after a performance e.g. a coach praising a young athlete after a successful performance will strengthen the S-R bond.</li> <li>• Negative reinforcement involves the removal of negative outcome / aversive stimulus (Skinner) in order to strengthen behaviour e.g. a coach who constantly shouts criticism from the sidelines stops. Players will then assume they are behaving in the correct manner thus strengthening the S-R bond. This tends to only work in the short term.</li> <li>• Punishment involves presenting or taking away a stimulus in order to weaken behaviour e.g. substituting a player who has made a bad tackle or red carding a player for violent play.</li> </ul>	1	3		4
2. (g)	<p><b>Using specific examples, analyse how guidance might vary for different stages of learning.</b></p> <p><b>Forms of guidance:</b></p> <ul style="list-style-type: none"> <li>• visual, verbal, manual and mechanical.</li> </ul> <p><b>Differences across stages of learning:</b></p> <ul style="list-style-type: none"> <li>• <i>Cognitive (beginner):</i></li> <li>• clear verbal guidance should be used in conjunction with visual guidance - 3 teaching points. Must be phrased in language that can be understood by the learner.</li> <li>• Manual and mechanical guidance is used for safety and to help a performer develop confidence and 'feeling' of the action.</li> <li>• <i>Autonomous phase (expert):</i></li> <li>• Visual guidance may be more technical e.g. performance analysis using biomechanics.</li> <li>• Verbal guidance will be more technical and detailed. May relate to other aspects of performance such as tactical awareness.</li> <li>• Manual guidance may be used where safety is a consideration eg. learning a new complex vault in gymnastics.</li> </ul>	2		4	6

Band	AO1 2 marks	AO3 4 marks
3		<p><b>3-4 marks</b></p> <p>Excellent analysis of how guidance may vary for the three different stages of learning.</p> <p>Relevant examples are provided throughout</p> <p>The response is clearly expressed and shows an accurate use of terminology.</p> <p>Writing is very well-structured and valid conclusions drawn.</p>
2	<p><b>2 marks</b></p> <p>Good knowledge of different forms of guidance (visual, verbal, manual and mechanical).</p> <p>Good use of specialist terminology throughout response.</p>	<p><b>2 marks</b></p> <p>Good analysis of how guidance may vary for a minimum of 2 different stages of learning.</p> <p>Some relevant examples are provided</p> <p>The response is adequately expressed and shows an accurate use of terminology.</p> <p>Writing is generally well-structured and there is some attempt to draw conclusions.</p>
1	<p><b>1 mark</b></p> <p>Limited knowledge of different forms of guidance (visual, verbal, manual and mechanical).</p> <p>Limited use of specialist terminology throughout response.</p>	<p><b>1 mark</b></p> <p>Limited analysis of how guidance may vary for different stages of learning</p> <p>Some examples are provided but they may not be sufficiently developed or linked to points.</p> <p>The response shows basic use of terminology.</p> <p>Writing shows some evidence of structure although conclusions may not be drawn.</p>
0	<p><b>0 marks</b></p> <p>No knowledge of guidance.</p>	<p><b>0 marks</b></p> <p>No analysis of how guidance will vary for different phases of learning.</p>

Question	Mark scheme	AO1	AO2	AO3	Total
3. (a)	<p><b>UK Sport's programme for supporting athletes realistic medal-winning capabilities at Olympic and Paralympic Games within four years is known as:</b></p> <p>Tick <b>one</b> box only.</p> <p><i>Award 1 mark for:</i></p> <p>E: World Class Podium</p>	1			1
3. (b)	<p><b>Explain Cashmore's three levels of globalisation of sport.</b></p> <p><b>3x2marks</b> <b>Max 3 marks can be awarded for a general understanding of globalisation</b></p> <p>Cashmore suggests that there are three levels of globalisation in sport namely:</p> <ul style="list-style-type: none"> <li>• <b>the creation of global sporting competitions</b> e.g. Premier League football is shown across the planet and clubs such as Manchester United have supporters' clubs across all continents. Rise of new competitions such as the Indian Premier League (IPL) and NFL and NBA been played in the UK. Corporate word-wide sponsors such as Coca-Cola and McDonalds.</li> <li>• <b>the development of satellite communications</b> e.g. people across the world can share and experience events such as Olympic 100m final 'live'</li> <li>• <b>growth of the global market of sports teams,</b> sports stars and sports merchandise e.g. evolution of sports brands such as Nike and Under Armour and the cult of celebrity such as the creation of the Jordan or Beckham 'brands' .</li> </ul>	2	4		6

Question	Mark scheme	AO1	AO2	AO3	Total
<p><b>3. (c)</b></p>	<p><b>Evaluate the influence of social media within sport.</b>  <i>Award up to 2 marks for discussion of advantages and up to 2 marks for discussion of disadvantages.</i></p> <p><b>Advantages of social media</b></p> <ul style="list-style-type: none"> <li>• Provides up-to-the-second coverage of sports news and events and trends.</li> <li>• Opportunity to communicate directly with audience (fans) - greater reach and direct engagement. Allows fans to voice their opinions and interact with their favourite athletes.</li> <li>• Players use social media to ‘connect’ with their fans whilst at the same time promoting their brand and commercial ventures.</li> <li>• New commercial opportunity for clubs/individuals/sponsors to reach a wider audience and promote their brand.</li> <li>• Can be used by athletes to gain attention eg. moving clubs or securing scholarship deals.</li> <li>• Greater interactions at live events with additional commercial activity such as seat upgrades and online purchases.</li> <li>• increases in participation</li> </ul> <p><b>Disadvantages of social media</b></p> <ul style="list-style-type: none"> <li>• Overexposure and sensationalisation of players’ private lives.</li> <li>• Lapses in professionalism are available for all to see.</li> <li>• Comments made on social media can have an adverse effect on a player’s career (and commercial value).</li> <li>• Athletes can be stalked online (internet trolling).</li> <li>• Sedentary</li> <li>• Perceptions</li> </ul>			4(a)	4

Question	Mark scheme	AO1	AO2	AO3	Total
3. (d)	<p><b>Analyse the reasons why governments invest in elite sport and in the hosting of major global games such as the Olympics.</b></p> <ul style="list-style-type: none"> <li>• Social benefits - such sporting success can boost national pride and morale (concept of the 'feel good factor'). Increased social harmony and cohesion.</li> <li>• Economic benefits – shop window policy - raising the profile of country / city. Increased tourism and business investment. Job creation.</li> <li>• Infrastructure benefits - building of new transport links and stadia/venues - the idea of 'legacy'. Upgraded amenities.</li> <li>• Health benefits - higher levels of grass roots participation will, inevitably lead to associated health benefits/reduction of strain on the NHS.</li> <li>• Political benefits - sport as a form of propaganda.</li> <li>• Sport-specific benefits - can lead to increased participation (widen the base of the participation pyramid) as sport is given more media exposure.</li> <li>• Creation of role models – links with social learning theory. Lord Coe – everything starts from emulation and aspiration.</li> <li>• Increased success at elite level leads to increased participation which then leads to larger talent pool. This should, in theory, lead to more elite athletes, more medals, more role models and, consequently, increased participation.</li> </ul>		4	5	9

<b>Band</b>	<b>AO2 4 marks</b>	<b>AO3 5 marks</b>
<b>3</b>	<p><b>3-4 marks</b> Excellent application.</p> <p>A wide range of appropriate examples are used to illustrate main points, both in terms of investing in elite sport and global events.</p>	<p><b>5 marks</b> Excellent analysis of reasons why governments invest heavily in elite sport and global events.</p> <p>The response is clearly expressed and shows an accurate use of terminology.</p> <p>Writing is very well-structured and valid conclusions are drawn.</p>
<b>2</b>	<p><b>2 marks</b> Good application.</p> <p>A number of appropriate examples are used to illustrate main points although there may be a lack of balance between the two areas.</p>	<p><b>3-4 marks</b> Good analysis of reasons why governments invest heavily in elite sport and global events.</p> <p>The response is adequately expressed and shows an accurate use of terminology.</p> <p>Writing is generally well-structured and there is some attempt to draw conclusions.</p>
<b>1</b>	<p><b>1 mark</b> Limited application.</p> <p>Few relevant examples selected and they do not illustrate main points effectively.</p>	<p><b>1-2 mark</b> Limited analysis of reasons why governments invest heavily in elite sport and global events.</p> <p>The response shows basic use of terminology.</p> <p>Writing shows evidence of structure although conclusions may not be drawn.</p>
<b>0</b>	<p><b>0 marks</b> No application evident. No examples are used to illustrate points.</p>	<p><b>0 marks</b> No discussion of reasons why governments invest heavily in elite sport and global events.</p>

Question	Mark scheme	AO1	AO2	AO3	Total
4. (a)	<p><b>A cartwheel takes place:</b></p> <p>Tick <b>one</b> box only.</p> <p>Award 1 mark for:</p> <p><i>D: About the frontal axis and along the frontal plane.</i></p>	1			1
4. (b)	<p><b>Analyse the role of the triceps brachii during both the downward and upward phase of this action.</b></p> <p><i>Award up to 2 marks for:</i> During the downward phase (flexion at the elbow), the tricep brachii is working eccentrically (muscle lengthening under tension) to control the movement.</p> <p><i>Award up to 2 marks for:</i> During the upward phase (extension at the elbow), the tricep brachii is working concentrically (muscle length shortening under tension) as the agonist to produce the movement.</p>		2	2	4
4. (c)	<p><b>A discus thrower applies a force of 40N for one second during their throw.</b></p> <p><b>Calculate, showing your workings, the impulse of the discuss at the moment of release.</b></p> <p>1 mark for formula: Impulse = Force x Time (<i>measured in Ns</i>)</p> <p>For one rotation: Ft = 40N x 1sec = 40Ns</p> <p>2 marks for correct answer with units</p> <p><i>The calculation must include the correct units for both marks to be awarded and working must be shown.</i></p>	2			2

Question	Mark scheme	AO1	AO2	AO3	Total
4. (d)	<p><b>Discuss how developments in technology have impacted on the official in recent years.</b></p> <p><i>Max 3 marks from Advantages or Disadvantages</i></p> <p><b>Advantages for officials (positive aspects)</b></p> <ul style="list-style-type: none"> <li>Ability to be able to review or refer decisions (eg. use of TMO in rugby and Hawkeye in cricket) has meant that decisions tend to be more accurate. Less pressure on the one official to get it right first time around.</li> <li>Consequently, it is likely (although not certain) that players have more confidence in the decisions that are made.</li> <li>Improved communication between officials through the use of wireless technology.</li> <li>Increased accuracy eg. use of timing and measuring devices in athletics.</li> </ul> <p><b>Disadvantages for officials (negative aspects)</b></p> <ul style="list-style-type: none"> <li>Confidence in officials decisions questioned - do officials now feel they need to refer to technology all of the time? Loss of respect for the officials' decisions.</li> <li>Media can use technology to highlight errors made by officials.</li> <li>Technology is not flawless and cannot be used in all situations.</li> <li>Cost is prohibitive in all levels of sport apart from the elite.</li> <li>Nature of the use of technology means that play is often disrupted for extended periods of time when decisions are reviewed.</li> </ul>		2	2	4
4. (e)	<p><b>Describe the main structural and functional characteristics of slow oxidative (Type I) muscle fibres which make them suitable for endurance-based activities.</b></p> <p><i>Award 1 mark for any of the following points below:</i></p> <p><b>Structural</b></p> <ul style="list-style-type: none"> <li>Large number of mitochondria present.</li> <li>Rich in myoglobin stores.</li> <li>Dense capillary network.</li> <li>Other (if relevant)</li> </ul> <p><b>Functional</b></p> <ul style="list-style-type: none"> <li>Weak and slow contractions but do not tire easily (fatigue index low).</li> <li>Oxidative enzyme activity is high.</li> <li>Other (if relevant)</li> </ul>	3			3



Question	Mark scheme	AO1	AO2	AO3	Total
4. (f)	<p><b>Using appropriate sporting examples, explain how topspin and backspin change the flight path of a ball</b></p> <p><i>Up to 3 marks to be awarded for points below (application):</i></p> <p><b>Topspin</b></p> <ul style="list-style-type: none"> <li>• Topspin is created by applying a force above the centre of mass e.g. hitting a tennis groundstroke from low to high and 'brushing' over the top of the ball causing forward rotation about the transverse axis.</li> <li>• Hitting a ball with topspin causes a Magnus force to act on the ball perpendicular to the velocity of the ball in the downward direction.</li> <li>• Because of the Magnus force (downward force) on the ball, tennis players can hit the ball with a greater speed and have it land in the court using topspin.</li> <li>• Balls can be hit higher above the net, making the shot more difficult to return and results in a higher bounce for the ball.</li> </ul>	2	4		6

Question	Mark scheme	AO1	AO2	AO3	Total
	<p><i>Up to 3 marks to be awarded for points below (application):</i></p> <p><b>Backspin</b></p> <ul style="list-style-type: none"> <li>• Backspin is created by applying a force below the centre of mass eg. hitting a tennis groundstroke from high to low and ‘slicing’ under the bottom of the ball causing backward rotation about the transverse axis.</li> <li>• Hitting a ball with backspin causes a Magnus force to act on the ball perpendicular to the velocity of the ball in the upward direction.</li> <li>• Because there is an additional upward force on the ball, the ball seems to ‘float’ through or ‘hang’ in the air as it flies.</li> <li>• Slice shots are normally hit low over then net and with a relatively slow speed, in order to keep them from going out of the bounds of the court.</li> <li>• This results in the lower bounce for the ball and enables players to hit with precision.</li> </ul> <p><b>Indicative content</b></p> <p><i>Up to 2 marks to be awarded for general points below:</i></p> <ul style="list-style-type: none"> <li>• When a ball is hit (eg. tennis, table tennis, golf), spin is often imparted on it to affect its trajectory and bounce. The type of spin put on the ball affects its trajectory in the air, as well as how it bounces.</li> <li>• This spin is govern by a principle known as the Magnus effect (and the subsequent Magnus force).</li> <li>• Spin is created by applying a force outside the centre of mass. Where this eccentric force is applied will be the determine factor in the type of spin created / imparted on the ball.</li> <li>• The spinning of a ball causes the drag forces at the top and bottom of the ball to be unequal. These drag forces can be thought of as exerting a unequal pressure on the ball, with greater drag corresponding to greater pressure. The resulting pressure differential then causes a net force on the ball in the direction of the low pressure.</li> <li>• Boundaries layers</li> </ul>				

Question	Mark scheme	AO1	AO2	AO3	Total
5. (a)	<p>The value marked X in Figure 4 is showing:</p> <p>Tick <b>one</b> box only.</p> <p>Award one mark for:</p> <p>E:     Expiratory reserve volume</p>	1			1
5. (b)	<p><b>Explain how neural control helps regulate cardiac output during exercise.</b></p> <p><i>Award 1 mark for each of the following points if explained fully.</i></p> <p><b>Changes to heart rate</b></p> <ul style="list-style-type: none"> <li>• Sympathetic nervous system causes increase in heart rate (and consequently cardiac output). Accelerator nerve</li> <li>• Parasympathetic nervous system causes a decrease in heart rate (and consequently cardiac output). Vagus Nerve</li> <li>• Cardiac Control Centre CCC</li> <li>• Changes in blood pH (caused by increase in CO<sub>2</sub> levels) stimulates the sympathetic nervous system. Chemoreceptor</li> <li>• Increases in movements are picked up by proprioceptors which cause an increase in heart rate.</li> <li>• Baroreceptors detect changes in blood pressure. Increased arterial pressure leads to increased heart rate whilst decrease in the stretch the receptors will lead to a decrease in heart rate.</li> <li>• Increased firing/stimulation of SA Node</li> </ul> <p><b>Changes to stroke volume</b></p> <ul style="list-style-type: none"> <li>• Increase in venous return will lead to greater stroke volume (action of muscle pump)</li> <li>• Application of Starling's law: increased venous return leads to greater filling of heart vessels during diastolic phase. This leads to cardiac fibres stretches which increases force of contraction (increase in ejection fraction).</li> </ul>		3		3

Question	Mark scheme	AO1	AO2	AO3	Total
5. (c)	<p><b>Define flexibility and explain the principles behind proprioceptive neuromuscular facilitation (PNF) stretching.</b></p> <p><i>1 mark for definition of flexibility</i> Flexibility is defined as 'the range of movement around a joint'.</p> <p><i>Up to 3 marks for explanation of PNF stretching.</i></p> <ul style="list-style-type: none"> <li>• CRAC technique (contract-relax-antagonist-contract).</li> <li>• Passive stretch performed with the assistance of a partner (stretch detected by muscle spindle apparatus).</li> <li>• Followed by isometric contraction against resistance to override the stretch reflex (held for 6-8 seconds). This leads to autogenic inhibition (golgi tendon organs).</li> <li>• Passive stretch performed again to increase range of movement. This process is then repeated to increase range of movement.</li> </ul>	1	3		4
5. (d)	<p><b>Using information from the Figure 5, explain what happens to both heart rate and blood lactate concentration as exercise intensity increases.</b></p> <p><b>Quantitative</b> <i>Award up to 2 marks for:</i></p> <ul style="list-style-type: none"> <li>• There is no change in heart rate as exercise intensity increases from 13km/h to 15km/h (steady state).</li> <li>• As intensity increases from 15km/h to 17km/h, there is a slight increase in heart rate (from 60bpm to approx. 80bpm).</li> <li>• As intensity increases from 17km/h to 19km/h, there is an exponential/rapid increase in heart rate from approx. 80bpm to 160bpm.</li> </ul> <p><i>Award 1 mark for:</i></p> <ul style="list-style-type: none"> <li>• Blood lactate concentration gradually increases over the exercise period from just above 6mM to 8mM.</li> </ul> <p><i>There must be reference to the values within the graph for 3 marks.</i></p>	2	1		3

Question	Mark scheme	AO1	AO2	AO3	Total
5. (e)	<p><b>Explain how you would apply the principle of progressive overload within fartlek training.</b></p> <p><i>Award 1 mark for knowledge of progressive overload and moderation.</i></p> <p><i>Award 3 marks for application to fartlek training (must be specific).</i></p> <ul style="list-style-type: none"> <li>• Progressive overload refers to the concept of gradually increasing the training intensity (placing more stress on the body in order to cause adaptations) over the training programme.</li> <li>• This can be achieved through: <ul style="list-style-type: none"> <li>• increasing intensity eg. fartlek sessions can be made harder by increasing amount of time spent in anaerobic zones, decreasing lower intensity/active recovery periods or by changing the terrain such as increasing gradients or running on different surfaces such as sand.</li> <li>• increasing duration eg. changing length of session from 20 minutes to 30 minutes or number of sprints</li> <li>• increasing frequency eg. increasing the number of training sessions per week.</li> </ul> </li> <li>• If training is too light or infrequent, then minimal adaptation will occur.</li> </ul>	1	3		4

Question	Mark scheme	AO1	AO2	AO3	Total
5. (f)	<p><b>Analyse how exercise intensity and duration and levels of fitness affect food fuel usage during physical activity.</b></p> <p><b>Indicative content:</b></p> <p><b>Level of fitness</b></p> <ul style="list-style-type: none"> <li>• Fitter individuals will take longer to reach their anaerobic threshold. PC stores can be conserved and these stores will be replenished at a much faster rate.</li> <li>• Fitter individuals also have increased glycogen stores and so are able to carry out medium-high intensity activity for a longer period of time.</li> <li>• Fitter individuals will be able to utilise more fats at lower intensity leaving greater stores of carbohydrates for when exercise intensity increases.</li> </ul> <p><b>Exercise intensity</b></p> <ul style="list-style-type: none"> <li>• The body will always use the most efficient source of fuel.</li> <li>• For very high intensity activity (ATP/PC system), phosphocreatine (PC stores) are utilised to convert ADP into ATP.</li> <li>• For medium-high intensity activity (where lactic acid system is used), the main fuel utilised is carbohydrate. Glycogen is broken down into glucose then pyruvic acid and then finally into lactic acid (lactate). This process creates energy.</li> <li>• For low-medium intensity exercise (where the aerobic system is used), a mixture of carbohydrates and fats are utilised. Fats require 15% more oxygen to be metabolised than carbohydrates.</li> </ul> <p><b>Duration of exercise</b></p> <ul style="list-style-type: none"> <li>• For short exercise duration, the main food fuel utilised will be carbohydrates.</li> <li>• For moderate duration exercise (up to 2hrs), carbohydrates and fats will be used equally.</li> <li>• For prolonged exercise, the percentage of carbohydrate usage will decrease and percentage of fats used will increase. Links with the concept of glycogen depletion (hitting the wall).</li> </ul> <p><i>Bands to be added.</i></p>	4		6	10

Band	AO1 4 marks	AO2 0 marks	AO3 6 marks
3			<p><b>5-6 marks</b> Excellent <b>analysis of all three areas</b></p> <p>Relevant examples are provided throughout</p> <p>The response is clearly expressed and shows an accurate use of terminology. Writing is very well structured</p>
2	<p><b>3-4 marks</b> Good knowledge of food fuel usage during physical activity</p>		<p><b>3-4 marks</b> Good analysis at least two areas</p> <p>Relevant examples are provided throughout application of exercise intensity, duration and levels of fitness</p> <p>The response is adequately expressed and shows an accurate use of terminology. Writing is generally well structured</p>
1	<p><b>1-2mark</b> limited knowledge of food fuel usage during physical activity</p>		<p><b>1-2 marks</b> Limited analysis looking at predominantly <b>one</b> area</p> <p>Relevant examples are provided. Limited application of exercise intensity, duration and levels of fitness</p> <p>The response shows basic use of terminology. Writing shows evidence of structure</p>
0	<p><b>0 marks</b> No knowledge of food fuel usage during physical activity</p>		<p><b>0 marks</b> No discussion of how performance analysis is used. No application of exercise intensity, duration and levels of fitness</p>

## Assessment Objectives

### Component 1 – Assessment Strategy

AOs	AO1	AO2	AO3 (a) (b)	TOTAL
%age	12%	15%	8%	35%
marks	36	45	24	105

### Quantitative assessment 3 marks

### Component 1 – 2018 Examination Series

	AO1	AO2	AO3 (a) (b)	TOTAL
Q1	8	12	0	20
Q2	9	7	4	20
Q3	3	8	9	20
Q4	8	8	4	20
Q5	6	14	5	25
Total	36	45	24	105



<b>Band</b>	<b>AO1 2 marks</b>	<b>AO2 2 marks</b>	<b>AO3 6 marks</b>
<b>3</b>	<b>3 marks</b> Excellent knowledge of	<b>5 marks</b> Excellent application of the  Appropriate examples of the techniques for each phase	<b>7-8 marks</b> Excellent <b>analysis</b>  Relevant examples are provided throughout  The response is clearly expressed and shows an accurate use of terminology. Writing is very well structured
<b>2</b>	<b>2 marks</b> Good knowledge of	<b>3-4 marks</b> Good application  Appropriate examples of the techniques used.	<b>4-6 marks</b> Good analysis  Relevant examples are provided throughout  The response is adequately expressed and shows an accurate use of terminology. Writing is generally well structured
<b>1</b>	<b>1 mark</b> limited knowledge of	<b>1-2 marks</b> Limited application of  Appropriate examples however may not cover all	<b>1-3 mark</b> Limited analysis  Relevant examples are provided  The response shows basic use of terminology. Writing shows evidence of structure
<b>0</b>	<b>0 marks</b> No knowledge of performance analysis	<b>0 marks</b> No application of knowledge and understanding of performance analysis	<b>0 marks</b> No discussion of how performance analysis is used.