



Pearson
Edexcel

Mark Scheme (Results)

October 2020

Pearson Edexcel Advanced Level
In Physical Education (9PE0/01)
Paper 1: Scientific Principles of Physical Education

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Section A

Question Number	Answer	Additional Guidance	Mark
1a	Supination is external rotation between radius and humerus/turning palm of the hand upwards		(1)

Question Number	Answer	Additional Guidance	Mark
1b	Adduction is movement towards the midline of the body		(1)

Question Number	Answer	Additional Guidance	Mark
1c	Abduction is movement away from the midline of the body		(1)

Question Number	Answer	Additional Guidance	Mark
2	<p>Either:</p> <ul style="list-style-type: none"> • An object in motion will remain in motion until an outside force acts on it <p>Or:</p> <ul style="list-style-type: none"> • An object will remain stationary until an outside force acts on it • Any suitably applied example 	1 mark for the law and 1 mark for application	(2)

Question Number	Answer	Additional Guidance	Mark
3	<ul style="list-style-type: none"> • Fulcrum is elbow joint • Effort is biceps contracting • Loads/resistance is weight of forearm and weight being lifted 		(3)

Question Number	Answer	Additional Guidance	Mark																								
4	<table border="1"> <thead> <tr> <th>Component</th> <th>Structure</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Arteries</td> <td>- Thick walls - Elastic fibres - A layer of muscle</td> <td>- Resist high pressure of blood. Allow it to stretch when blood comes through - Allow blood to be diverted to where needed in the body</td> </tr> <tr> <td>Capillaries</td> <td>1 cell thick</td> <td>Allow gas exchange</td> </tr> <tr> <td>Veins</td> <td>One-way valves</td> <td>To prevent back flow of blood</td> </tr> <tr> <td>Valves</td> <td>Elastic tissue</td> <td>To allow movement of blood in one direction/control flow of blood</td> </tr> <tr> <td>Atria</td> <td>Thick muscular walls</td> <td>To pump blood to ventricles</td> </tr> <tr> <td>Ventricles</td> <td>Thick muscular walls</td> <td>To pump blood to body and lungs/tolerate high pressure</td> </tr> <tr> <td>SA/AV nodes</td> <td>Allow electrical conductivity</td> <td>Allow the electrical impulse to initiate the next stage of contraction</td> </tr> </tbody> </table>	Component	Structure	Function	Arteries	- Thick walls - Elastic fibres - A layer of muscle	- Resist high pressure of blood. Allow it to stretch when blood comes through - Allow blood to be diverted to where needed in the body	Capillaries	1 cell thick	Allow gas exchange	Veins	One-way valves	To prevent back flow of blood	Valves	Elastic tissue	To allow movement of blood in one direction/control flow of blood	Atria	Thick muscular walls	To pump blood to ventricles	Ventricles	Thick muscular walls	To pump blood to body and lungs/tolerate high pressure	SA/AV nodes	Allow electrical conductivity	Allow the electrical impulse to initiate the next stage of contraction	Structure must link to function	(4)
Component	Structure	Function																									
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Question Number	Answer	Additional Guidance	Mark
5a	<ul style="list-style-type: none"> • Maximum volume forcefully expired after maximal inspiration • $VC = IRV + TV + ERV$ 		(1)

Question Number	Answer	Additional Guidance	Mark																		
5b	<table border="1"> <thead> <tr> <th>Value or Capacity</th> <th>Change during exercise</th> </tr> </thead> <tbody> <tr> <td>Tidal volume</td> <td>Increase</td> </tr> <tr> <td>Inspiratory reserve volume</td> <td>Decrease</td> </tr> <tr> <td>Expiratory reserve volume</td> <td>(Slight) Decrease</td> </tr> <tr> <td>Residual volume</td> <td>(Slight) Decrease</td> </tr> <tr> <td>Vital capacity</td> <td>(Slight) Decrease</td> </tr> <tr> <td>Inspiratory capacity</td> <td>Increase</td> </tr> <tr> <td>Functional residual capacity</td> <td>(Slight) Increase</td> </tr> <tr> <td>Total Lung capacity</td> <td>(Slight) Decrease</td> </tr> </tbody> </table>	Value or Capacity	Change during exercise	Tidal volume	Increase	Inspiratory reserve volume	Decrease	Expiratory reserve volume	(Slight) Decrease	Residual volume	(Slight) Decrease	Vital capacity	(Slight) Decrease	Inspiratory capacity	Increase	Functional residual capacity	(Slight) Increase	Total Lung capacity	(Slight) Decrease	<p>1 mark for each correctly identified</p> <p>Accept increase or decrease without additional descriptor</p>	(4)
Value or Capacity	Change during exercise																				
Tidal volume	Increase																				
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6	<table border="1"> <thead> <tr> <th data-bbox="300 315 600 398">Characteristic</th> <th data-bbox="600 315 903 398">Suitability</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 398 600 517">High in PC</td> <td data-bbox="600 398 903 517">High rate of contraction</td> </tr> <tr> <td data-bbox="300 517 600 674">High stores of PC</td> <td data-bbox="600 517 903 674">Maintain high rate of contraction for longer</td> </tr> <tr> <td data-bbox="300 674 600 786">Increased fibre size</td> <td data-bbox="600 674 903 786">Allows increased strength</td> </tr> <tr> <td data-bbox="300 786 600 898">High force production</td> <td data-bbox="600 786 903 898">Allows speed/power</td> </tr> <tr> <td data-bbox="300 898 600 1016">High actin and myosin</td> <td data-bbox="600 898 903 1016">Allows faster contraction</td> </tr> </tbody> </table>	Characteristic	Suitability	High in PC	High rate of contraction	High stores of PC	Maintain high rate of contraction for longer	Increased fibre size	Allows increased strength	High force production	Allows speed/power	High actin and myosin	Allows faster contraction	Linked points	(4)
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High stores of PC	Maintain high rate of contraction for longer														
Increased fibre size	Allows increased strength														
High force production	Allows speed/power														
High actin and myosin	Allows faster contraction														

Question Number	Answer	Additional Guidance	Mark
7	<ul style="list-style-type: none"> • Low intensity endurance training will result in asynchronous/rotational recruitment of different slow twitch muscle fibres • High intensity training e.g. sprinting will recruit more type IIx fibres • High intensity training results in more synchronous muscle fibre recruitment • As the muscle gets stronger, fewer fibres are required to produce the force needed • As the load increases IIa will be recruited to aid type I, as the load becomes greater still IIa will support IIx. • High intensity training will increase the rate of fibre recruitment • An example with a suitably/appropriately linked point 	<p>Points must link fibre type with intensity of training</p> <p>Examples can be methods of training or named activities or sports linked to the change in recruitment. Each example can be credited.</p>	(6)

Question Number	Answer	Additional Guidance	Mark										
8	<table border="1"> <thead> <tr> <th data-bbox="300 315 528 409">Role</th> <th data-bbox="528 315 900 409">Example</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 409 528 611">Agonist/Prime mover</td> <td data-bbox="528 409 900 611">To be responsible for the movement e.g. such as bicep brachii in flexion during a bicep curl</td> </tr> <tr> <td data-bbox="300 611 528 853">Antagonist</td> <td data-bbox="528 611 900 853">To prevent over stretching of the agonist/oppose the movement e.g. tricep brachii in flexion during a bicep curl.</td> </tr> <tr> <td data-bbox="300 853 528 1077">Fixator</td> <td data-bbox="528 853 900 1077">To stabilise the bone where the prime mover originates e.g. such as gluteus when kicking a ball</td> </tr> <tr> <td data-bbox="300 1077 528 1294">Synergist</td> <td data-bbox="528 1077 900 1294">To stabilise the joint where the prime mover is acting e.g. such as abdominals when kicking a ball</td> </tr> </tbody> </table>	Role	Example	Agonist/Prime mover	To be responsible for the movement e.g. such as bicep brachii in flexion during a bicep curl	Antagonist	To prevent over stretching of the agonist/oppose the movement e.g. tricep brachii in flexion during a bicep curl.	Fixator	To stabilise the bone where the prime mover originates e.g. such as gluteus when kicking a ball	Synergist	To stabilise the joint where the prime mover is acting e.g. such as abdominals when kicking a ball		(4)
Role	Example												
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Fixator	To stabilise the bone where the prime mover originates e.g. such as gluteus when kicking a ball												
Synergist	To stabilise the joint where the prime mover is acting e.g. such as abdominals when kicking a ball												

Question Number	Answer	Mark
9	<p>AO1 = 4 marks, AO3 = 4 marks</p> <p>Students who only show achievement against AO1 will not be able to gain marks beyond level 1.</p> <p>Reward acceptable answer. Responses may include, but are not limit to the following:</p> <ul style="list-style-type: none"> • Mechanical Energy (AO1) for example a moving ball or a bar bell above an athlete's head (AO3) • Electrical Energy (AO1) for example transport of a nerve impulse (AO3) • Potential Energy (AO1) for example when in the 'set' position on starting blocks or a pole-vaulted mid-flight or an archery bow in the drawn back position (AO3) • Chemical Energy (AO1) for example when acetyl choline crosses the synapse (AO3) • Kinetic Energy (AO1) for example in movement e.g. running (AO3) <p>The indicative content is a guide to the responses candidate may give. Other valid responses which answer the question correctly can be credited as appropriate.</p> <p>The candidate's response must be read in conjunction with the level descriptor below in order to give the appropriate mark. For example, a response that is firmly in the level would receive the middle mark in the level, a response that is just into the level would receive the bottom mark in the level, a response which nearly reaches the next level would receive the top mark in the level preceding it.</p>	(8)

Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> • No rewardable material
Level 1	1-2	<ul style="list-style-type: none"> • Some accurate and relevant knowledge (AO1). • Simple or generalised statements supported by limited evidence (AO1). • Limited balancing of ideas against each other (AO3). • Limited evaluative statement (AO3).
Level 2	3-5	<ul style="list-style-type: none"> • A good level of accurate and relevant knowledge (AO1). • A line of reasoning is presented and supported by some evidence (AO1).

		<ul style="list-style-type: none"> Examines a wide range of ideas, balancing ideas against each other (AO3). An evaluative statement which is relevant (AO3)
Level 3	6-8	<ul style="list-style-type: none"> A high level of accurate and relevant knowledge (AO1). Articulates a clear viewpoint with clarity and precision which is well substantiated (AO1). Critically examines a wide range of issues balancing ideas against each other (AO3). Clear evaluative statement which is thorough and focussed (AO3)

Question Number	Answer	Additional Guidance	Mark
10	<ul style="list-style-type: none"> PC replenishment brings levels back to normal Removal of lactate returns the body back to the correct levels Removal of Hydrogen ions reduced acidity Rehydration allows the body to return to homeostasis Thermoregulation allows the body to cool temperature back to normal Re-saturation of myoglobin allows the oxygen to be transported in the muscle Re-synthesis of protein brings body back to usual levels Re-synthesis of Glycogen restores stores ready for future use Oxygen delivery remains elevated to help recovery processes Ventilation and HR remain elevated to increase oxygen delivery 		(8)

Question Number	Answer	Mark
11	<p>AO1 = 4 marks, AO3 = 4 marks</p> <p>Students who only show achievement against AO1 will not be able to gain marks beyond level 1.</p> <p>Reward acceptable answer. Responses may include, but are not limit to the following:</p> <ul style="list-style-type: none"> • Lack of regular exercise (AO1) makes lungs, respiratory muscles and heart weaker and inhibits oxygen delivery (AO3) • Cigarette smoking (AO1) damages the lung tissue/ increase risk of cancer of the lung (AO3) • Drinking alcohol (AO1) increases blood pressure (AO3) • Improper diet (AO1) could result in increased blood pressure increasing the strain on the heart/ increased coronary heart disease (AO3) • Poor diet (AO1) leading to obesity which increases the energy cost of moving, putting more strain on the heart and lungs (AO3) <p>Points should relate to the cardiorespiratory system, not the cardiovascular system.</p> <p>The indicative content is a guide to the responses candidate may give. Other valid responses which answer the question correctly can be credited as appropriate.</p> <p>The candidate's response must be read in conjunction with the level descriptor below in order to give the appropriate mark. For example, a response that is firmly in the level would receive the middle mark in the level, a response that is just into the level would receive the bottom mark in the level, a response which nearly reaches the next level would receive the top mark in the level preceding it.</p>	(8)

Level	Mark	Descriptor
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Level 1	1-2	<ul style="list-style-type: none"> • Some accurate and relevant knowledge (AO1). • Simple or generalised statements supported by limited evidence (AO1). • Limited balancing of ideas against each other (AO3). • Limited evaluative statement (AO3).
Level 2	3-5	<ul style="list-style-type: none"> • A good level of accurate and relevant knowledge (AO1).

		<ul style="list-style-type: none"> • A line of reasoning is presented and supported by some evidence (AO1). • Examines a wide range of ideas, balancing ideas against each other (AO3). • An evaluative statement which is relevant (AO3)
Level 3	6-8	<ul style="list-style-type: none"> • A high level of accurate and relevant knowledge (AO1). • Articulates a clear viewpoint with clarity and precision which is well substantiated (AO1). • Critically examines a wide range of issues balancing ideas against each other (AO3). • Clear evaluative statement which is thorough and focussed (AO3)

Question Number	Answer	Mark
12	<p>AO2 = 5 marks, AO3 = 10 marks</p> <p>Students who only draw their answer from one area of study will not be able to gain marks beyond Level 3.</p> <p>Reward acceptable answer. Responses may include, but are not limit to the following:</p> <ul style="list-style-type: none"> • Analysis of concept of energy continuum (time-based) (AO3) • ATP-PC in Anaerobic power events (AO2) • Analysis of combination of all in intermittent activity and endurance/mid-range events (AO3) • Use of Glycolytic system to support events up to a minute (AO2) and contributions to longer • Use of Aerobic system could include carbohydrate and fat usage (AO2) • Analysis of interaction between them and contribution of different systems (AO3) <p>The indicative content is a guide to the responses candidate may give. Other valid responses which answer the question correctly can be credited as appropriate.</p> <p>The candidate's response must be read in conjunction with the level descriptor below in order to give the appropriate mark. For example, a response that is firmly in the level would receive the middle mark in the level, a response that is just into the level would receive the bottom mark in the level, a response which nearly reaches the next level would receive the top mark in the level preceding it.</p>	(15)

Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> • No rewardable material
Level 1	1-3	<ul style="list-style-type: none"> • There are limited links between theory and practice. Limited technical language supports isolated elements of knowledge and understanding (AO2). • Limited analysis of the factors that underpin performance and involvement in physical activity and sport (AO3). • Analysis is not used to make a judgement (AO3).
Level 2	4-6	<ul style="list-style-type: none"> • Makes few links between theory and practice. Basic technical language supports some elements of knowledge and understanding (AO2).

		<ul style="list-style-type: none"> • Attempts some analysis of the factors that underpin performance and involvement in physical activity and sport (AO3). • Analysis may not be used to make a clear judgement (AO3).
Level 3	7-9	<ul style="list-style-type: none"> • Makes some links between theory and practice. Some appropriate technical language supports a good knowledge and understanding (AO2). • Good analysis of the factors that underpin performance and involvement in physical activity and sport (AO3). • Uses analysis to make a judgement but without full substantiation (AO3).
Level 4	10-12	<ul style="list-style-type: none"> • Makes strong links between theory and practice. Appropriate technical language supports a very good knowledge and understanding (AO2). • Comprehensive analysis of the factors that underpin performance and involvement in physical activity and sport (AO3). • Uses analysis to make a clear judgement and supports this with examples (AO3).
Level 5	13-15	<ul style="list-style-type: none"> • Makes many insightful and significant links between theory and practice. Appropriate technical language supports a significant level of knowledge and understanding (AO2). • Sophisticated analysis of the factors that underpin performance and involvement in physical activity and sport (AO3). • Uses analysis to make a fully informed judgement and supports this with examples (AO3).

Section B

Question Number	Answer	Additional Guidance	Mark
13	The maximum force that can be developed in a muscle or group of muscles during a single maximal contraction		(1)

Question Number	Answer	Additional Guidance	Mark
14	<ul style="list-style-type: none">• Macrocycles• Mesocycles• Microcycles• Preparation phase (general)• Preparation Phase (specific)• Competition Phase• Transition Phase		(5)

Question Number	Answer	Additional Guidance	Mark										
15	<table border="1"> <thead> <tr> <th>Principle</th> <th>How to improve localised muscular endurance</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>Train more times in the week</td> </tr> <tr> <td>Intensity</td> <td>An increase in resistance /repetitions would increase intensity</td> </tr> <tr> <td>Time</td> <td>Train for longer amounts of time/more repetitions/reduced recovery time</td> </tr> <tr> <td>Type</td> <td>Do specific training for muscular endurance e.g. weight training/circuit training</td> </tr> </tbody> </table>	Principle	How to improve localised muscular endurance	Frequency	Train more times in the week	Intensity	An increase in resistance /repetitions would increase intensity	Time	Train for longer amounts of time/more repetitions/reduced recovery time	Type	Do specific training for muscular endurance e.g. weight training/circuit training		(4)
Principle	How to improve localised muscular endurance												
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Time	Train for longer amounts of time/more repetitions/reduced recovery time												
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Question Number	Answer	Additional Guidance	Mark
16	<ul style="list-style-type: none"> • Use of the BORG point numerical scale with associated descriptors • Athletes subjectively rate their perceived exertion • Measures the perceived intensity of their exercise • Subjective rather than objective method • Alternatives are available to the original 20-point scale • Simple and free to administrate 		(4)

Question Number	Answer	Additional Guidance	Mark										
17	<table border="1"> <thead> <tr> <th>Injury</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Strain</td> <td>A muscle tear</td> </tr> <tr> <td>Shin splints (periostitis)</td> <td>Ache or pain across shin bone from repeated stress of bones, muscles, joints</td> </tr> <tr> <td>Tendonitis (tennis or golfers elbow)</td> <td>Inflammation of the tendons</td> </tr> <tr> <td>Stress fracture</td> <td>Fracture of the bone caused by repeated stress</td> </tr> </tbody> </table>	Injury	Description	Strain	A muscle tear	Shin splints (periostitis)	Ache or pain across shin bone from repeated stress of bones, muscles, joints	Tendonitis (tennis or golfers elbow)	Inflammation of the tendons	Stress fracture	Fracture of the bone caused by repeated stress		(4)
Injury	Description												
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Tendonitis (tennis or golfers elbow)	Inflammation of the tendons												
Stress fracture	Fracture of the bone caused by repeated stress												

Question Number	Answer	Additional Guidance	Mark
18	<p>Advantages:</p> <ul style="list-style-type: none"> • Pain relief • Muscle healing • Reduced inflammation • Faster method than traditional • Can target the whole body • Stimulates release of adrenalin <p>Disadvantages:</p> <ul style="list-style-type: none"> • Accessibility to resource • Cost • Skin damage • Specialist knowledge required from administrators • Discomfort 	<p>Candidates cannot score full marks from just advantages/disadvantages</p> <p>Submax 3 marks on each section</p>	(6)

Question Number	Answer	Additional Guidance	Mark
19	<ul style="list-style-type: none"> • Cool down • Ice baths • Compression Clothing • Massage • Nutrition • Cryotherapy • Ultrasound • Rest 		(4)

Question Number	Answer	Additional Guidance	Mark																
20	<table border="1"> <thead> <tr> <th>Supplement</th> <th>How it helps recovery</th> </tr> </thead> <tbody> <tr> <td>Creatine</td> <td>Increases recovery rate of muscle cells</td> </tr> <tr> <td>Cherry juice</td> <td>Reduces inflammation</td> </tr> <tr> <td>Branched Chain Amino Acids</td> <td>Helps repair muscle</td> </tr> <tr> <td>Whey Protein/Protein Powder</td> <td>Helps repair muscle damage</td> </tr> <tr> <td>Glutamine</td> <td>Decreases inflammation</td> </tr> <tr> <td>Antioxidants</td> <td>Reduces muscle damage</td> </tr> <tr> <td>Carbohydrate</td> <td>Boosts glycogen stores</td> </tr> </tbody> </table>	Supplement	How it helps recovery	Creatine	Increases recovery rate of muscle cells	Cherry juice	Reduces inflammation	Branched Chain Amino Acids	Helps repair muscle	Whey Protein/Protein Powder	Helps repair muscle damage	Glutamine	Decreases inflammation	Antioxidants	Reduces muscle damage	Carbohydrate	Boosts glycogen stores	Linked points - no marks for naming of supplements alone, they must link to how they help recovery.	(5)
Supplement	How it helps recovery																		
Creatine	Increases recovery rate of muscle cells																		
Cherry juice	Reduces inflammation																		
Branched Chain Amino Acids	Helps repair muscle																		
Whey Protein/Protein Powder	Helps repair muscle damage																		
Glutamine	Decreases inflammation																		
Antioxidants	Reduces muscle damage																		
Carbohydrate	Boosts glycogen stores																		

Question Number	Answer	Additional Guidance	Mark
21a	Target Heart rate = (Heart rate reserve x percentage heart rate) + resting heart rate		(1)

Question Number	Answer	Additional Guidance	Mark
21b	Heart rate reserve = Maximum heart rate - resting heart rate		(1)

Question Number	Answer	Additional Guidance	Mark
21c	<ul style="list-style-type: none"> • 197bpm - 50bpm = • 147bpm 	Can gain 2 marks for correct answer only	(2)

Question Number	Answer	Additional Guidance	Mark
21d	<p>Lowest:</p> <ul style="list-style-type: none"> • 60% of 147 = 88.2 88.2 + 50 = 138.2bpm (accept 138bpm) <p>Highest:</p> <ul style="list-style-type: none"> • 80% of 147 = 117.6 117.6 + 50 = 167.6bpm (accept 168bpm) 		(2)

Question Number	Answer	Mark
22	<p>AO2 = 4 marks, AO3 = 4 marks</p> <p>Reward acceptable answer. Responses may include, but are not limit to the following:</p> <ul style="list-style-type: none"> • Technique (AO2) • Clothing/Suits (AO2) • Streamlining (AO2) • Drag force/Fluid friction (AO2) • Gravitational pull v buoyancy (AO2) • Lift (AO2) • Speed /size/shape of swimmer (AO3) • Stroke used (AO2) • Water temperature (AO2) • Water depth (AO2) • Level of fitness (AO2) • Indoor/outdoor environmental factors (AO2) • Appropriate analysis of the content (AO3) <p>The indicative content is a guide to the responses candidate may give. Other valid responses which answer the question correctly can be credited as appropriate.</p> <p>The candidate's response must be read in conjunction with the level descriptor below in order to give the appropriate mark. For example, a response that is firmly in the level would receive the middle mark in the level, a response that is just into the level would receive the bottom mark in the level, a response which nearly reaches the next level would receive the top mark in the level preceding it.</p>	(8)

Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> • No rewardable material
Level 1	1-2	<ul style="list-style-type: none"> • There are few links between theory and practice. Isolated elements of knowledge and understanding (AO2). • There is little application of knowledge and understanding of factors that underpin performance and involvement in physical activity and sport (AO2). • Limited balancing of ideas against each other (AO3). • Limited evaluative statement (AO3).

Level 2	3-5	<ul style="list-style-type: none"> • Makes connections between theory and practice (AO2). • Applies a knowledge and understanding of factors that underpin performance and involvement in physical activity and sport (AO2). • Examines a wide range of ideas, balancing ideas against each other (AO3). • An evaluative statement which is relevant (AO3).
Level 3	6-8	<ul style="list-style-type: none"> • Makes many insightful and significant connections between theory and practice (AO2). • Applies an excellent knowledge and understanding of factors that underpin performance and involvement in physical activity and sport (AO2). • Critically examines a wide range of issues balancing ideas against each other (AO3). • Clear evaluative statement which is thorough and focussed (AO3).

Question Number	Answer	Mark
23	<p>AO1 = 4 marks, AO3 = 4 marks</p> <p>Students who only show achievement against AO1 will not be able to gain marks beyond level 1.</p> <p>Reward acceptable answer. Responses may include, but are not limit to the following:</p> <ul style="list-style-type: none"> • Train in humid conditions for a period before (AO1) • Arrive early (AO1) • Taper training (AO1) • Prep in acclimatisation chamber (AO1) • Timing (AO1) • High intensity sessions done in early am/late pm (AO3) • Phase in gradually so adaptation can occur (AO3) • A camp before in a humid environment (AO1) • Training sessions and warmups to be modified- don't need excessive warm up (AO3) • Fluid replacement to increase (AO3) • Pre-cooling- reduce body temp before comp (AO3) • Use of ice bath before competition (AO1) • Hydration strategy (AO3) • Suitable analysis of factors (AO3) <p>The indicative content is a guide to the responses candidate may give. Other valid responses which answer the question correctly can be credited as appropriate.</p> <p>The candidate's response must be read in conjunction with the level descriptor below in order to give the appropriate mark. For example, a response that is firmly in the level would receive the middle mark in the level, a response that is just into the level would receive the bottom mark in the level, a response which nearly reaches the next level would receive the top mark in the level preceding it.</p>	(8)

Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> • No rewardable material
Level 1	1-2	<ul style="list-style-type: none"> • Some accurate and relevant knowledge (AO1).

		<ul style="list-style-type: none"> • Simple or generalised statements supported by limited evidence (AO1). • Limited balancing of ideas against each other (AO3). • Limited evaluative statement (AO3).
Level 2	3-5	<ul style="list-style-type: none"> • A good level of accurate and relevant knowledge (AO1). • A line of reasoning is presented and supported by some evidence (AO1). • Examines a wide range of ideas, balancing ideas against each other (AO3). • An evaluative statement which is relevant (AO3).
Level 3	6-8	<ul style="list-style-type: none"> • A high level of accurate and relevant knowledge (AO1). • Articulates a clear viewpoint with clarity and precision which is well substantiated (AO1). • Critically examines a wide range of issues balancing ideas against each other (AO3). • Clear evaluative statement which is thorough and focussed (AO3).

Question Number	Answer	Mark
*24	<p>AO1 = 5 marks, AO3 = 10 marks</p> <p>Students who only show achievement against AO1 will not be able to gain marks beyond Level 1.</p> <p>Students who only draw their answer from one area of study will not be able to gain marks beyond Level 4.</p> <p>Reward acceptable answer. Responses may include, but are not limit to the following:</p> <ul style="list-style-type: none"> • Sensors in jerseys (AO1) can track biometrics to calculate risk of being injured (AO3) • Electromyography (AO1) tracks muscle performance • Sensors in fields and sports – motion tracking and LED visualisation technology built into basketball courts (AO1) • VR headsets (AO1) to visualise on field scenarios without risk of injury (AO3) • 360-degree training videos (AO1) from a player’s perspective • Video analysis (AO1) • Wearable sensors for runners (AO1) • Any other contemporary examples will be rewarded (AO1) • Suitable analysis of the content (AO3) <p>The indicative content is a guide to the responses candidate may give. Other valid responses which answer the question correctly can be credited as appropriate.</p> <p>The candidate’s response must be read in conjunction with the level descriptor below in order to give the appropriate mark. For example, a response that is firmly in the level would receive the middle mark in the level, a response that is just into the level would receive the bottom mark in the level, a response which nearly reaches the next level would receive the top mark in the level preceding it.</p>	(15)

Level	Mark	Descriptor
	0	<ul style="list-style-type: none"> • No rewardable material

Level 1	1-3	<ul style="list-style-type: none"> • Limited understanding of the factors that underpin performance and involvement in physical activity and sport. This is communicated in a basic way with simple or generalised statements (AO1). • Limited analysis of the factors that underpin performance and involvement in physical activity and sport (AO3). • Little analysis of performance due to limited application of relevant skills and techniques in physical activity and sport (AO3). • Analysis is not used to make a judgement (AO3).
Level 2	4-6	<ul style="list-style-type: none"> • Attempts some understanding of the factors that underpin performance and involvement in physical activity and sport and organises or expresses ideas with some clarity (AO1). • Attempts some analysis of the factors that underpin performance and involvement in physical activity and sport (AO3). • Attempts to apply relevant skills and techniques in physical activity and sport to analyse performance (AO3). • Analysis may not be used to make a clear judgement (AO3).
Level 3	7-9	<ul style="list-style-type: none"> • Evidence of some basic understanding of the factors that underpin performance and involvement in physical activity and sport and offers a logical clear writing structure (AO1). • Evidence of some analysis of the factors that underpin performance and involvement in physical activity and sport (AO3). • Some application of relevant skills and techniques in physical activity and sport to analyse performance (AO3). • A judgement may be given but with limited substantiation (AO3).
Level 4	10-12	<ul style="list-style-type: none"> • Key issues are explored, but not all viewpoints may be addressed. The answer is generally well organised, communicated with clarity but may lack precision (AO1). • Analyses the factors that underpin performance and involvement in physical activity and sport (AO3). • Application of relevant skills and techniques in physical activity and sport to analyse performance (AO3). • Uses analysis to make a clear judgement and supports this • with examples (AO3).
Level 5	13-15	<ul style="list-style-type: none"> • Excellent knowledge and understanding of factors that underpin performance and involvement in physical activity and sport. Communicated in a coherent writing structure with clarity and precision (AO1). • Sophisticated analysis of the factors that underpin performance and involvement in physical activity and sport (AO3).

		<ul style="list-style-type: none">• Uses analysis to make a fully informed judgement and supports this with examples (AO3).
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