



Pearson
Edexcel

Mark Scheme (Results)

November 2021

Pearson Edexcel GCSE
In Physical Education (1PE0)
Paper 1 Fitness and Body Systems

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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.

Question Number	Answer	Mark
	A01 – 1 mark	
1 (a)	<p>The only correct answer is A – Ball and socket</p> <p>Incorrect options: <i>B - Condylloid = 2 planes of motion/biaxial</i></p> <p><i>C - Hinge = 1 plane of motion/uniaxial</i></p> <p><i>D - Pivot = 1 plane of motion/uniaxial</i></p>	(1)

Question Number	Answer	Mark
	A02 – 1 mark	
1 (b)	<p>The only correct answer is B – Gastrocnemius contracts and the tibialis anterior relaxes</p> <p><i>Only option that is an antagonistic pair</i></p>	(1)

Question Number	Answer	Mark
	A01 – 1 mark	
1 (c)	<p>The only correct answer is D – Wrist</p> <p>Incorrect options: <i>A - Atlas and axis = pivot joint</i></p> <p><i>B - Knee = hinge joint</i></p> <p><i>C - Shoulder = ball and socket joint</i></p>	(1)

Question Number	Answer	Mark
	A03 – 1 mark	
1 (d)	<p>The only correct answer is C – The fulcrum is closest to the effort (i.e. short effort arm)</p> <p>Incorrect options: <i>A – mechanical advantage</i></p> <p><i>B – no disadvantage</i></p> <p><i>D – mechanical advantage</i></p>	(1)

Question Number	Answer	Mark
	A02 – 1 mark	
1 (e)	<p>The only correct answer is B – 200</p> <p>Incorrect options: <i>A – 220 – age = 200 rather than 190</i></p> <p><i>C – 220 – age = 200 rather than 210</i></p> <p><i>D – 220 – age = 200 rather than 220</i></p>	(1)

Question Number	Answer	Mark
	A03 – 1 mark	
1 (f)	<p>The only correct answer is C – 15 minutes (80% lower limit anaerobic training zone)</p> <p>Incorrect options: <i>A – 70% within aerobic training zone</i></p> <p><i>B – 70% within aerobic training zone</i></p> <p><i>D – 90% upper limit anaerobic training zone</i></p>	(1)

Question Number	Answer	Mark
	A03 – 1 mark	
1 (g)	<p>The only correct answer is B – Good</p> <p>Incorrect options: <i>A – Excellent – would need to be less than 3.9 seconds</i></p> <p><i>C – Average – would need to be between 4.3 and 4.5 seconds</i></p> <p><i>D – Fair – would need to be more than 4.5 seconds</i></p>	(1)

Question Number	Answer	Mark
A02 – 1 mark		
1 (h)	<p>The only correct answer is A – Not allowing sticks to go over head height in field hockey</p> <p>Incorrect options:</p> <p><i>B – relates to passing infringement rather than safety</i></p> <p><i>C – relates to the size of the team</i></p> <p><i>D – relates to how the game is scored</i></p>	(1)

Question number	Answer	Mark												
AO1 – 6 marks														
2 (a&b)	<p>1 mark for each correct identification.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Bone</th> <th>(a) Classification of bone</th> <th>(b) Function of each classification of bone</th> </tr> </thead> <tbody> <tr> <td>Femur</td> <td>Long (1)</td> <td>Leverage (1) To make it easier to move a load (1)</td> </tr> <tr> <td>Vertebra</td> <td>Irregular (1)</td> <td>Protection (1) Muscle attachment (1)</td> </tr> <tr> <td>Scapula</td> <td>Flat (1)</td> <td>Protection (1) Muscle attachment (1)</td> </tr> </tbody> </table> <p>Accept other appropriate responses</p>	Bone	(a) Classification of bone	(b) Function of each classification of bone	Femur	Long (1)	Leverage (1) To make it easier to move a load (1)	Vertebra	Irregular (1)	Protection (1) Muscle attachment (1)	Scapula	Flat (1)	Protection (1) Muscle attachment (1)	(6)
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Question number	Answer	Mark
	AO1 – 2 marks; AO2 - 2 marks; AO3 - 2 marks	
3	<p>For example:</p> <p>Elbow Flexion has occurred at the elbow (1) due to the contraction of the biceps (1) and the relaxation (1)</p> <p>Hip Flexion has occurred at the hip (1) due to the contraction of the hip flexors (1) and the relaxation of the gluteals/gluteus maximus (1)</p> <p>Accept other appropriate responses</p> <p>DNA Muscles flex</p> <p>1 mark for analysis of each joint action in image (AO3) 1 mark for linking each joint action to antagonistic muscle action required (AO2) 1 mark for reason for movement at each joint (AO1)</p>	(6)

Question number	Answer	Mark
	AO2 – 1 mark; AO3 - 1 mark	
4 (a)	<p>For example:</p> <ul style="list-style-type: none"> • (Extra carbon dioxide) is produced/is a waste product of respiration (1) which they need to remove to delay fatigue (1) <p>Accept other appropriate responses</p> <p>NB To gain 'fatigue' mark must link to CO₂ rather than energy or oxygen.</p>	(2)

Question number	Answer AO1 – 1 mark	Mark
4 (b)	<p>1 mark for correct identification.</p> <ul style="list-style-type: none"> • Alveolus • Alveoli <p>NB Accept phonetic spelling</p>	(1)

Question number	Answer AO2 – 2 marks	Mark
4 (ci)	<p>For example:</p> <ul style="list-style-type: none"> • The 100m sprint is anaerobic (1) as there is not enough time to produce energy aerobically (1) • It is an explosive/high intensity/short race (1) that uses type IIx/fast twitch fibres which don't utilise oxygen (1) • They work anaerobically (1) so do not need oxygen to generate energy/can get energy from carbohydrates without using oxygen (1) <p>Accept other appropriate responses</p>	(2)

Question number	Answer AO2 – 1 mark	Mark
4 (cii)	<p>1 mark for correct identification.</p> <ul style="list-style-type: none"> • Rises • Goes up • Increases <p>Accept other appropriate responses</p>	(1)

Question number	Answer AO3 – 3 marks	Mark
5 (a)	<p>1 mark for correct identification of following.</p> <p>NB Must be stated in this order.</p> <p>(i) 3rd class (ii) 1st class (iii) 2nd class</p> <p>Accept other appropriate responses</p>	(3)

Question number	Answer AO1 – 1 mark	Mark
5 (b)	<p>1 mark for correct identification.</p> <ul style="list-style-type: none"> • 2nd class <p>Accept other appropriate responses</p>	(1)

Question number	Answer AO1 – 1 mark	Mark
5 (c)	<p>1 mark for correct identification.</p> <ul style="list-style-type: none"> • Mechanical advantage 	(1)

Question number	Answer AO1 – 1 mark	Mark
6 (a)	<p>1 mark for correct identification.</p> <ul style="list-style-type: none"> • Social 	(1)

Question number	Answer	Mark									
	AO2 – 2 marks; AO3 – 2 marks										
6 (b&c)	<p>1 mark for each correct identification.</p> <table border="1"> <thead> <tr> <th>Event phase</th> <th>(b) Component of fitness used in phase</th> <th>(c) Importance of component of fitness in this phase</th> </tr> </thead> <tbody> <tr> <td>Take off</td> <td>Power (1)</td> <td>To get the height required to clear the bar (1)</td> </tr> <tr> <td>Shape over the bar</td> <td>Flexibility (1)</td> <td>To create the arched shape so body doesn't knock the bar (1)</td> </tr> </tbody> </table> <p>Accept other appropriate responses</p>	Event phase	(b) Component of fitness used in phase	(c) Importance of component of fitness in this phase	Take off	Power (1)	To get the height required to clear the bar (1)	Shape over the bar	Flexibility (1)	To create the arched shape so body doesn't knock the bar (1)	(4)
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Shape over the bar	Flexibility (1)	To create the arched shape so body doesn't knock the bar (1)									

Question number	Answer	Mark
	AO2 – 2 marks; AO3 - 1 mark	
6 (d)	<p>For example:</p> <ul style="list-style-type: none"> In hockey you have to make quick decisions (1) for example whether to pass or shoot before you are tackled (1) whereas in golf you are not being challenged for the ball/do not have the same time pressure therefore reaction time is not critical in this sport (1) Golfer's time own shots when ready (1) a hockey player has to react to rapidly/make quick decisions (1) to a changing environment/eg before being tackled (1) <p>Accept other appropriate responses</p>	(3)

Question number	Answer AO1 – 1 mark; AO3 - 2 marks	Mark
7 (a)	<p>For example:</p> <ul style="list-style-type: none"> • Have aerobic properties/has both aerobic and anaerobic characteristics (1) so greater endurance than type IIx to sustain use (1) but produce more power than type 1 so can maintain a faster pace (1) <p>Accept other appropriate responses</p>	(3)

Question number	Answer AO1 – 1 mark	Mark
7 (bi)	<p>1 mark for correct identification</p> <ul style="list-style-type: none"> • Muscular endurance 	(1)

Question number	Answer AO1 – 1 mark	Mark
7 (bii)	<p>1 mark for correct identification</p> <ul style="list-style-type: none"> • Power • Muscular power • Explosive strength 	(1)

Question number	Answer AO1 – 1 mark	Mark
7 (biii)	<p>1 mark for correct identification</p> <ul style="list-style-type: none"> • Cardiovascular endurance • CV fitness • Aerobic endurance • Aerobic fitness <p>Accept other appropriate terminology for aerobic fitness</p>	(1)

Question number	Answer AO2 – 1 mark; AO3 - 1 mark	Mark
7 (c)	<p>For example:</p> <ul style="list-style-type: none"> • Continuous training to improve his CV fitness (1) so he can work aerobically for longer/has enough oxygen for energy/aerobic respiration to maintain a good pace over the 25 laps (1) <p>Accept other appropriate responses</p> <p>1 mark for identification of correct training method for event (AO2) 1 mark for reason why this is best to improve performance (AO3)</p>	(2)

Question number	Answer AO2 – 1 mark; AO3 - 1 mark	Mark
7 (d)	<p>For example:</p> <ul style="list-style-type: none"> • Plyometrics (1) as this develops power/explosive strength which is not the main requirement for this event (1) • Plyometrics (1) as this event requires sustained muscle contraction rather than explosive movement (1) <p>Accept other appropriate responses</p> <p>1 mark for identification of correct training method for event (AO2) 1 mark for reason why this is best to improve performance (AO3)</p>	(2)

Question Number	Answer AO1 – 3 marks	Mark
7 (e)	<p>1 mark for each correct statement within the linked description.</p> <p>For example:</p> <ul style="list-style-type: none"> • Form of continuous training (1) that varies pace (1) and uses a variety of terrains (1) • Keep running without a break (1) but vary the running so you run at different intensities (1) over different types of surfaces (1) <p>Accept other appropriate responses</p> <p>1 mark for continuous nature/length of training 1 mark for reference to varying intensity/pace 1 mark for reference to varying terrain</p>	(3)

Question number	Answer AO1 – 1 mark; AO2 - 1 mark	Mark
7 (f)	<p>For example:</p> <ul style="list-style-type: none"> • Lactate accumulates when there is not enough oxygen supplied/when working anaerobically (1) this occurs in Fartlek training after a high intensity part of the training/when they increase their speed/when they run up hill (1) <p>Accept other appropriate responses</p> <p>1 mark for identification of why lactate accumulates (AO1) 1 mark for recognition when this occurs in Fartlek training (AO2)</p>	(2)

Question number	Answer AO2 – 2 marks	Mark
8	<p>For example:</p> <ul style="list-style-type: none"> • Because the heart rate fluctuates/goes up and down (1) to match the work and rest intervals/sets and reps in interval training (1) <p>Accept other appropriate responses</p> <p>1 mark for reason this is interval training (AO2) 1 mark for expansion of why interval training makes heart rate fluctuate in this way (AO2)</p>	(2)

Question number	Answer AO3 – 1 mark	Mark
9 (a)	<p>1 mark for correct identification.</p> <ul style="list-style-type: none"> • Each sport shows a downward trend over each year • Downwards trend <p>Accept other appropriate responses</p>	(1)

Question number	Answer AO3 – 1 mark	Mark
9 (b)	<p>1 mark for correct identification.</p> <ul style="list-style-type: none"> • 2013 	(1)

Question number	Answer AO1 – 2 marks; AO2 - 1 mark	Mark
9 (c)	<p>For example:</p> <ul style="list-style-type: none"> • Protective equipment/clothing (1) for example, hockey masks (1) will reduce the number of head injuries if the ball strikes the face/head (1) • Checking for faulty equipment before playing (1) eg a broken bench in a circuit training session/a weight not properly secured on a bar (1) so they don't twist an ankle as the bench breaks/the weight doesn't drop onto the foot (1) <p>Accept other appropriate responses</p> <p>1 mark for identification of injury prevention measure (AO1) 1 mark for example (AO2) 1 mark for reason why this measure reduces injury (AO1)</p>	(3)

Question number	Answer AO1 – 3 marks	Mark
9 (d)	<p>For example:</p> <ul style="list-style-type: none"> • Progressive overload/gradually increasing overload (1) will help prevent <u>overuse</u> injuries (1) as the body is not forced to work too hard (1) • Progressive overload/gradually increasing overload (1) will help the body adapt/not asking the body to do too much in one go (1) preventing <u>overuse</u> injuries (1) • Rest and recovery/by building in an appropriate number of rest days (1) this will prevent overtraining (1) as the body/muscle has time to repair before the next session (1) <p>Accept other appropriate responses</p> <p>1 mark for identification of injury prevention (AO1) 1 mark for expansion through description or naming of relevant principle (AO1) 1 mark for reason why this reduces risk of injury (AO1)</p>	(3)

Question number	Answer AO1 – 2 marks; AO2 – 2 marks	Mark									
9 (e&f)	<p>One mark for each correct identification.</p> <table border="1"> <thead> <tr> <th>Sport</th> <th>(e) Sports injury</th> <th>(f) How sports injury may occur</th> </tr> </thead> <tbody> <tr> <td>Basketball</td> <td>Sprain (1)</td> <td>Landing awkwardly after jumping to block a shot (1)</td> </tr> <tr> <td>Cycling</td> <td>Abrasion (1)</td> <td>Falling from bike (1)</td> </tr> </tbody> </table> <p>Accept other appropriate responses</p> <p>NB (f) must relate to (e).</p>	Sport	(e) Sports injury	(f) How sports injury may occur	Basketball	Sprain (1)	Landing awkwardly after jumping to block a shot (1)	Cycling	Abrasion (1)	Falling from bike (1)	(4)
Sport	(e) Sports injury	(f) How sports injury may occur									
Basketball	Sprain (1)	Landing awkwardly after jumping to block a shot (1)									
Cycling	Abrasion (1)	Falling from bike (1)									

Question number	Answer AO1 – 2 marks	Mark
9 (g)	<p>For example:</p> <ul style="list-style-type: none"> Masks the pain of the injury (1) so they can maintain training/carry on playing (1) <p>Accept other appropriate responses</p> <p>1 mark for identification of masking/hiding pain (AO1) 1 mark for expansion of reason (AO1)</p>	(2)

Question number	Answer AO2 – 1 mark – AO3 – 1 mark	Mark
9 (h)	<p>For example:</p> <ul style="list-style-type: none"> Stretching will improve the temperature of the gymnast's muscle/make their muscle more elastic/pliable (1) therefore they will have a wider range of movement to perform techniques correctly (1) <p>Accept other appropriate responses</p> <p>1 mark for identification of reason (AO2) 1 mark for expansion of reason (AO3)</p>	(2)

Question Number	Indicative content (A01 – 3 marks; A02 - 3 marks for application; A03 - 3 marks for evaluation)	Mark
10	<p>Reward acceptable answers. Responses may include, but are not limited to, the following:</p> <p>Knowledge and understanding of the different functions (A01).</p> <ul style="list-style-type: none"> • Muscle attachment (A01) • Production of platelets (A01) • Storage of calcium/phosphorus (A01) • Protection (A01) <p>Application of knowledge, linking the function to participation in rugby. (A02).</p> <ul style="list-style-type: none"> • Muscle attachment (A01) for example the biceps and triceps needed to pass the ball attach to the bones of the arm and shoulder (A02) • Production of platelets (A01) so if the player receives a cut from a boot during the game the wound will seal (A02) • Storage of calcium/phosphorus (A01) these increase bone density so will allow Pete to take part in a contact sport like rugby (A02) • Protection (A01) for example the rib cage will protect vital organs from being crushed (A02) <p>Evaluation of topic – making reasoned judgments about the importance of the three functions of the skeleton to the rugby player (A03).</p> <ul style="list-style-type: none"> • Muscle attachment (A01) for example the biceps and triceps needed to pass the ball attach to the bones of the arm and shoulder (A02) this is essential so as the muscle contracts it pulls the bone allowing the movement needed to pass/run to play the game, without this he would be unable to move (A03) • Production of platelets (A01) so if the player receives a cut from a boot during the game the wound will seal (A02) this is essential so that the player can remain on the field of play because if the blood flow is not stopped the player will be substituted (A03) • Storage of calcium/phosphorus (A01) these increase bone density so will allow Pete to take part in a contact sport like rugby (A02) this will reduce the risk of injury, therefore is essential in avoiding time off from training while the injury heals, avoiding reversibility (A03) • Protection (A01) for example the rib cage will protect vital organs from being crushed (A02) so they can be tackled/can tackle other players and therefore be effective in the game (A03) <p>Students who only show achievement against A01 will not be able to gain marks beyond level 1.</p>	(9)

Level	Mark	Descriptor
	0	No rewardable material
1	1-3	<ul style="list-style-type: none"> • Demonstrates isolated elements of knowledge and understanding, with limited technical language used (AO1). • Limited attempt to apply knowledge to question context (AO2). • Generic assertions may be presented (AO3 - evaluation).
2	4-6	<ul style="list-style-type: none"> • Demonstrates mostly accurate knowledge and understanding, including appropriate use of technical language in places (AO1). • Applied knowledge to question context (AO2). • Attempts at drawing conclusion, with some support from relevant evidence (AO3 – evaluation).
3	7-9	<ul style="list-style-type: none"> • Demonstrates accurate knowledge and understanding throughout, including appropriate use of technical language (AO1). • Applied detailed knowledge to question context throughout (AO2). • Reaches a valid and well-reasoned conclusion supported by relevant evidence (AO3 – evaluation).

Question Number	Indicative content (A01 – 3 marks; A02 - 3 marks for application; A03 - 3 marks for evaluation)	Mark
11	<p>Reward acceptable answers. Responses may include, but are not limited to, the following:</p> <p>Knowledge and understanding of the different fitness tests (A01).</p> <ul style="list-style-type: none"> • One-minute press-up is a test of muscular endurance (AO1) • Cooper 12 minute swim is a test of CV fitness (AO1) • Grip dynamometer test is a test of strength (AO1) <p>Application of knowledge, linking the tested component of fitness to the needs of the triathlete (A02).</p> <ul style="list-style-type: none"> • No specific test for the bike or running phases of event • One-minute press-up is a test of muscular endurance (AO1) they need ME as this is a long event requiring the muscles to work/contract continuously for a sustained period of time (AO2) • Cooper 12 minute swim is a test of CV fitness (AO1) this is needed in order to ensure there is enough oxygen/nutrients transported to the muscles to provide energy for each phase of this long event (AO2) • Grip dynamometer test is a test of strength (AO1) the greater strength Lola has the more force she can apply to the ground/water to reduce the time taken to complete each part of the event (AO2) <p>Evaluation of topic – making reasoned judgments about the suitability of the fitness tests to assess the triathlete’s fitness (A03).</p> <ul style="list-style-type: none"> • One-minute press-up is a test of muscular endurance (AO1) they need ME as this is a long event requiring the muscles to work/contract continuously for a sustained period of time (AO2) however, this is a test of muscular endurance in the arms/doesn’t test muscular endurance in the legs, needed in the cycling and running phases of the race (AO3) • Cooper 12 minute swim is a test of CV fitness (AO1) this is needed in order to ensure there is enough oxygen/nutrients transported to the muscles to provide energy for each phase of this long event (AO2). This is a suitable test for the triathlete to use as it tests their CV fitness in a pool, therefore matches the movement required in the swimming phase of the event (AO3) • Grip dynamometer test is a test of strength (AO1) the greater strength Lola has the more force she can apply to the ground/water to reduce the time taken to complete each part of the event (AO2) although it is useful to measure her strength this is a test of lower arm strength and not the strength in her legs so will be more relevant to the swimming stage of the event (AO3) • Each of the tests have some suitability for this activity but to cover all parts of the event a greater range of sport specific tests would be required. 	

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