Pearson Edexcel

Mark Scheme (Results)

November 2020

Pearson Edexcel GCSE
In Physical Education (1PE0)
Paper 01 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 AO1 – 1 mark	Mark
1 (a)	**The only correct answer is D – (Left) ventricle** ***A*** *is not correct because this is the vena cava* ***B*** *is not correct because this is the left atrium* ***C*** *is not correct because this is the tricuspid valve*	**(1)**

Question Number	Answer AO2 – 1 mark	Mark
1 (b)	**The only correct answer is D – Third class lever system** ***A, B and C*** *are not correct because* this is a third class lever as the effort is between the fulcrum and the resistance or load	**(1)**

Question Number	Answer AO3 – 1 mark	Mark
1 (c)	**The only correct answer is B – Excellent** ***A*** *is not correct because range is 18.1 – 16.2 therefore longer than 15.1s* ***C*** *is not correct because range is 19.1 – 18.2 therefore longer than 15.1s* ***D*** *is not correct because range is 16.1 – 15.2 therefore longer than 15.1s*	**(1)**

Question Number	Answer AO1 – 1 mark	Mark
1 (d)	**The only correct answer is B – Grip dynamometer** ***A*** *is not correct because this measures speed* ***C*** *is not correct because this measures muscular endurance* ***D*** *is not correct because this measures muscular endurance*	**(1)**

Question Number	Answer AO1 – 1 mark	Mark
1 (e)	**The only correct answer is B – Progressive overload** ***A*** *is not correct because overtraining means too much training leading to injury* ***C*** *is not correct because reversibility means a reduction in training so loss of fitness* ***D*** *is not correct because specificity means matching training to needs of activity*	**(1)**

Question Number	Answer AO1 – 1 mark	Mark
1 (f)	**The only correct answer is A – Circuit training** ***B*** *is not correct because interval training is repeated high intensity with recovery periods* ***C*** *is not correct because plyometric training is bounding exercises lengthening the muscle and then suddenly contracting to increase power* ***D*** *is not correct because weight training is the use of resistance using sets and reps to improve strength or muscular endurance*	**(1)**

Question Number	Answer AO3 – 1 mark	Mark
1 (g)	**The only correct answer is C – Indicate interval training session** ***A*** *is not correct because heart rate remains constant at 70bpm indicates at rest* ***B*** *is not correct because initial increase in heart rate and then constant – indicates continuous training* ***D*** *is not correct because gradual increase and then gradual decrease – no repeated sets*	**(1)**

Question Number	Answer AO1 – 1 mark	Mark
1 (h)	**The only correct answer is A – Body pump** ***B*** *is not correct because this use of mats and possibly resistance bands but does not involve the traditional use of weights* ***C*** *is not correct because this use of exercise bikes* ***D*** *is not correct because this use of mats*	**(1)**

Question Number	Answer AO1 – 1 mark; AO2 – 2 marks	Mark
2 (i)	1 mark for each correct part of the answer • Vital organs/organs (1) • Cranium/skull (1) • Brain (1)	**(3)**

Question Number	Answer AO1 – 1 mark	Mark
2 (ii)	1 mark for correct answer • Platelets (1) Accept phonetic spelling	**(1)**

Question Number	Answer AO1 – 1 mark	Mark
2 (iii)	1 mark for correct answer • White (1) Accept other appropriate responses Accept phonetic spelling	**(1)**

<table>
<tr><th>Question Number</th><th>Answer
AO1 – 3 marks</th><th>Mark</th></tr>
<tr><td>3 (a & b)</td><td>1 mark for each correct answer

<table>
<tr><th>Bone</th><th>(a) Range of movement possible at each type of joint</th><th>(b) Example of type of joint in the body</th></tr>
<tr><td>Pivot</td><td>Rotation (1)</td><td>Atlas and axis (1)</td></tr>
<tr><td>Hinge</td><td>Flexion to extension (1)</td><td>Knee/elbow (1)</td></tr>
<tr><td>Ball and socket</td><td>Abduction to adduction (1)</td><td>Hip/shoulder (1)</td></tr>
</table>
NB Must be range – i.e. flexion and extension etc

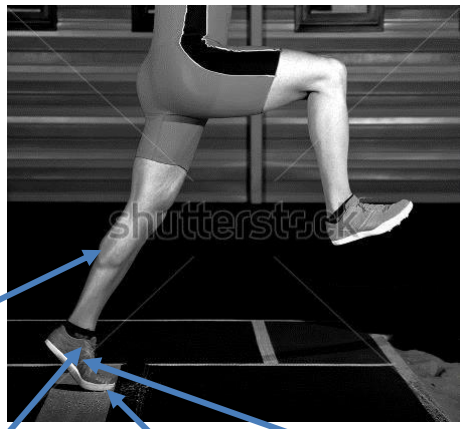
Accept other appropriate responses
PART (a)
Accept rotation and flexion to extension for ball and socket
NB Can credit same range of motion across joint types, provided correct for stated joint type

PART (b)
Accept example if correct for type of joint, even if incorrect range of movement given i.e. mark this independently of (a)</td><td>(6)</td></tr>
</table>

Question Number	Answer AO1 – 1 mark; AO3 – 1 mark	Mark
3 (c)	For example: • They are weight bearing/strong (1) this means the diver can start the dive on his hands/take his weight on his hands (to get more points for a harder dive) (1) Accept other appropriate responses 1 mark for identification of use (AO1) 1 mark for the importance of this on the diver (AO3)	**(2)**

Question Number	Answer AO1 – 2 marks	Mark
4 (a)	1 mark for each correct energy source **Anaerobic** • Carbohydrate (1) **Aerobic** • Fat (1) Accept other appropriate response **NB** Can accept carbohydrate/glycogen/glucose for either system **BUT** not both **DNA** Examples of energy sources, e.g. pasta **DNA** Carbs as not correct technical language	**(2)**

Question Number	Answer AO1 – 2 marks	Mark
4 (b)	• Anaerobic (1) because oxygen is not used /is not available (1) Accept other appropriate responses 1 mark for correct identification of exercise type 1 mark for suitable expansion indicating why lactic acid is produced	**(2)**

Question Number	Answer AO1 – 1 mark; AO3 – 3 marks	Mark
5 (a)	For example: • Because in second class lever systems the resistance falls between the fulcrum and the effort (1), this is shown in Figure 4 as the body weight is the resistance (1) the fulcrum is the ball of the foot (1) and the effort is the force produced by the muscle/gastrocnemius (1) Accept other appropriate response  1 mark for identification of characteristic of second class lever system (AO1) 1 mark for each aspect of analysis to justify why this ais a second class lever (AO3) – maximum of 3 marks for this aspect	**(4)**

Question Number	Answer AO1 – 1 mark; AO2 – 1 mark	Mark
5 (b)	For example: • Because the body is a heavy load that needs to be lifted off the ground (1) which can be moved by a relatively small amount of force from the muscle (to give the jumper the required height) (1) • Because the effort arm is longer than the resistance arm (1) therefore a heavy load/weight of jumper can be lifted with relatively little effort (1) Accept other appropriate responses 1 mark for reference to the body weight being a heavy load (AO2) 1 mark for this being relatively easy to move (AO1)	**(2)**

Question Number	Answer AO2 – 2 marks	Mark
6 (a)	<table><tr><th>Movement pattern</th><th>Plane</th><th>Axis</th></tr><tr><td>Cartwheel</td><td>Frontal (1)</td><td>Sagittal (1)</td></tr></table>	**(2)**

Question Number	Answer AO2 – 2 marks	Mark
6 (b)	<table><tr><th>Movement pattern</th><th>Plane</th><th>Axis</th></tr><tr><td>Piked somersault</td><td>Sagittal (1)</td><td>Frontal (1)</td></tr></table>	**(2)**

Question Number	Answer AO2 – 1 mark; AO3 – 1 mark	Mark
7 (a)	For example • Gastrocnemius contracts/ is the agonist/the antagonistic pair allow plantar-flexion at the ankle (1) • which means greater force can be applied/can jump higher/can push off the ground to take off (1) Accept other appropriate responses. 1 mark for analysis of antagonistic action (AO3) 1 mark for impact on performance (AO2)	**(2)**

Question Number	Answer AO1 – 1 mark	Mark
7 (b) (i)	1 mark for the correct identification of the component of fitness • Flexibility (1) Accept phonetic spelling	**(1)**

Question Number	Answer AO1 – 1 mark	Mark
7 (b) (ii)	1 mark for the correct identification of the component of fitness • Cardiovascular fitness (1) Accept other appropriate responses **DNA** Stamina **DNA** endurance	**(1)**

Question Number	Answer AO1 – 1 mark	Mark
7 (b) (iii)	1 mark for the correct identification of the component of fitness • Power (1)	**(1)**

Question Number	Answer AO2 – 1 mark; AO3 – 1 mark	Mark
7 (c)	(i) Sit and reach test – Excellent – Component of fitness tested: (1) (ii) Cooper 12-minute swim – Average – Component of fitness tested: (1) (iii) Vertical jump test – Average – Component of fitness tested: (1) For example: • **Power** (as only achieved average) (1) to jump higher/get height (to clear the bar) (1) Accept other appropriate responses **NB** No marks awarded if power not identified. 1 mark for analysis of data to determine area of fitness to be improved (AO3) 1 mark for explanation that links power to question context (AO2)	**(2)**

Question Number	Answer AO2 – 2 marks; AO3 – 1 mark	Mark
7 (d)		

	Fitness test	Rating	Component of fitness tested
(i)	Sit and reach test	Excellent	(1)
(ii)	Cooper 12-minute swim	Average	(1)
(iii)	Vertical jump test	Average	(1)

For example:

- **Cooper 12-minute swim** (1) as the test is **not specific** to their sport (1) as high jumpers **do not perform in water/swim** (1)
- Cooper 12-minute swim (1) as it is not specific to their sport (1) as it does not test a relevant component of fitness for high jump (1)
- Cooper 12-minute swim (1) as it is a test of CV fitness (1) but high jumpers work at maximal intensity/do not work at low to moderate intensity/do not work for a long period of time (1)

Accept other appropriate responses

1 mark for analysis of data to determine area of fitness/fitness test least relevant to high jump (AO3)
1 mark for why test is least relevant to HJ (AO2)
1 mark for explanation linked to high jump (AO2)

(3)

Question Number	Answer AO1 – 3 marks	Mark
7 (e)	1 mark for each correct statement within the linked description For example: • Training method using bounding/jumping (1) where the muscles lengthen (on landing) (1) and then quickly shorten (for the next jump) (1) • Training method using quick powerful/high intensity movements (1) so the muscles contract eccentrically (1) immediately followed by a concentric contraction (1) Accept other appropriate responses 1 mark for example of activity within plyometrics 1 mark for description of muscle action lengthening 1 mark for description of muscle then immediately shortening	**(3)**

Question Number	Answer AO3 – 2 marks	Mark
7 (f)	For example: • Weight training will increase strength/muscular endurance (1) which will not provide the explosive action needed /explosive power to jump higher (1) Accept other appropriate responses 1 mark for component of fitness improved through weight training 1 mark for reason why this is not applicable to high jump	**(2)**

Question Number	Answer AO3 – 1 mark	Mark
8 (a)	1 mark for correct indication of most likely trend • Her mile time will be slower/2 seconds longer/+18 seconds (1) Accept other appropriate responses	**(1)**

Question Number	Answer AO2 – 2 marks; AO3 – 2 marks	Mark
8 (b)	For example: • Because she runs every mile slower (1) so she needs to increase CV fitness to improve oxygen/nutrient delivery (1) to maintain her pace/reduce fatigue (1) and remove lactic acid before it accumulates (1) • Her times are slower at each mile (1) and the gap between the miles is increasing (1) because she cannot maintain the pace she set/because she is becoming fatigued (1) as she is unable to provide enough oxygen/nutrients to the working muscles (1) Accept other appropriate responses 1 mark for getting slower throughout the race (AO2) 1 mark for use of the data to show incremental drop in pace (AO2) 1 mark for evaluating the reason for this (AO3) 1 mark for justifying impact of improving CV fitness (AO3)	**(4)**

Question Number	Answer AO2 – 2 marks; AO3 – 1 mark	Mark
8 (c)	For example: • Continuous training (1), as she will be running for a long time /running without breaks/running for more than 20min/running for an extended period of time (1) therefore the training is specific to her event/replicates her event (1) • Fartlek training (1) because this allows her to practice running at different intensities (1) which will be important to her as some parts of the race could be steep/uphill (1) Credit **one mark only** for training methods that could improve CV fitness, even if not specific to marathon running, e.g. interval training and circuit training Accept other appropriate responses **DNA** inappropriate training methods (e.g. plyometrics), fitness tests or general fitness sessions. 1 mark for identifying a suitable training method (AO2) 1 mark for describing characteristic that makes this training method suitable (AO2) 1 mark for justifying the link between the characteristic of the method and the demands of the activity (AO3)	**(3)**

Question Number	Answer AO1 – 1 mark; AO2 – 1 mark	Mark
8 (d) (i)	For example: • More oxygen available (1) so work aerobically for longer/remove lactic acid (1) • CO_2 removed more quickly (1) (less CO_2) reduces risk of fatigue (1) • Increased surface area (1) therefore more oxygen available (1) • Increased rate of gas exchange/more efficient gas exchange (1) so quicker removal of CO_2/therefore more oxygen available (1) Accept other appropriate responses 1 mark for identifying it will increase rate of gas exchange (AO1) 1 mark for how this helps performer (AO2)	**(2)**

Question Number	Answer AO1 – 2 marks	Mark
8 (d) (ii)	1 mark for each correct training adaptation, to a maximum of **2** marks • Increased lung capacity/volume (1) • Increased vital capacity (1) • Increased strength of diaphragm (1) • Increased strength of external intercostal muscles (1) Accept other appropriate responses **DNA** Increased tidal volume (as response to exercise)	**(2)**

Question Number	Answer AO1 – 1 mark	Mark
9 (a)	For example: • To review medical history/heart condition /medication/ any **<u>health</u>** issues/ (1) • To assess personal readiness for training/check it is safe for you to exercise (1) • To make recommendations for amendment to training (due to health issues) (1) Accept other appropriate responses 1 mark for identification of purposes of PARQ	**(1)**

Question Number	Answer AO1 – 1 mark; AO3 – 1 mark	Mark
9 (b) (i)	For example: • To increase elasticity/pliability/**<u>temperature</u>** of muscles (1) so they are less likely to become injured during the class (1) • To increase the mobility at the joints (1) therefore increasing the range of movement possible (1) • To increase the range of movement (1) improving technique during the class/reducing risk of injury (1) Accept other appropriate responses 1 mark for identifying reason for stretching (AO1) 1 mark for impact of this (AO3)	**(2)**

Question Number	Answer AO1 – 1 mark	Mark
9 (b) (ii)	For example: • To <u>gradually</u> reduce heart rate (1) • (keep heart rate elevated) to help removal of waste products/lactic acid/CO_2 (1) • (keep heart rate elevated) to repay oxygen debt (1) Accept other appropriate responses 1 mark for identification of purpose of cool down	**(1)**

Question Number	Answer AO2 – 2 marks	Mark
9 (c)	1 mark for each correct response to a maximum of **2** marks • No spillages/tripping hazards (1) • The class know the correct techniques to use /know the safety rules (1) • Fitness equipment is safe to use/ machines not broken/machines working (1) • Student clothing is suitable/fit for purpose/no jewellery /hair tied back (1) • There is enough space for the class to work (1) Accept other appropriate responses	**(2)**

<table>
<tr><th>Question Number</th><th>Answer
AO2 – 4 marks</th><th>Mark</th></tr>
<tr><td>10 (a&b)</td><td>For example:

<table>
<tr><th>Performance-enhancing drug (PED)</th><th>(a) Sport or physical activity where effect of PED would be an advantage</th><th>(b) Advantage to performer in that sport or physical activity</th></tr>
<tr><td>Erythropoietin (EPO)</td><td>Marathon runner (1)
Long distance runner (1)
Triathlon (1)
Tour de France/long distance cycling (1)</td><td>• Increased oxygen delivery (1)
• Can work aerobically for longer (1)</td></tr>
<tr><td>Anabolic steroids</td><td>Sprinters (1)
Weightlifters (1)</td><td>• Allow performers to train harder for longer (1)
• Increase muscle mass/hypertrophy/ build muscle (1)
• Greater increase in power/strength (1)
• Speed up recovery time so train more frequently (1)</td></tr>
</table>

Accept other appropriate responses
EPO – any distance event
Anabolic steroids – any power event

1 mark for each correctly associated sport with the PED (AO2)
1 mark for each example of advantage to person form that sport/physical activity (AO2)</td><td>(4)</td></tr>
</table>

Question Number	Indicative content AO1 – 3 marks; AO2 – 3 marks; AO3 – 3 marks	Mark
11	Reward acceptable answers. Responses may include, but are not limited to, the following: **Knowledge and understanding of the different muscle fibre types (AO1).** Factual statements about the fibre types: • Characteristic of fast twitch/type IIx/type IIb fibre • Characteristic of type IIa fibre • Characteristic of slow twitch/type I fibre **Application of knowledge, linking the fibre type to <u>relevant aspect of the game</u> (AO2).** NB – single jump – type llx, however could also be use llx for sprinting (if short sprint): • Type IIx provide the most powerful contraction (AO1) so Dexter will use these fibre types to get the required height for the tipoff/to produce the required force to accelerate away from opponent (AO2) • Type IIa can be used for sustained high intensity/anaerobic work (AO1), so Dexter will use them when sprinting up and down the court (AO2) • Type 1 fibres produce the least amount of force of the fibre types (AO1) so they will be used in low intensity parts of the game when jogging back into position (AO2) **Evaluation of topic – making reasoned judgements about the importance of the three different muscle fibre types to the performer (AO3):** • Type IIx is essential as it provides the height needed to reach the ball first /jump higher to make first contact, without this the opposition would always get possession. • Type IIa are important to allow repeated sprints within the game so the player can maintain high intensity runs (AO3) • All three fibre types have a role within the game; however, fast twitch fibres allow the player to be quickest to the ball/jump higher, so they are more important than slow twitch fibres. Students who only show achievement against AO1 will not be able to gain marks beyond Level 1.	**(9)**

Level	Mark	Descriptor
	0	No rewardable material
1	1-3	• 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	• 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	• 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 AO1 – 3 marks; AO2 – 3 marks; AO3 – 3 marks	Mark
12	Reward acceptable answers. Responses may include, but are not limited to, the following: **Knowledge and understanding of the different components of fitness (AO1).** Factual statements about the components of fitness: • Identification of relevant components of fitness • Definitions of the relevant components of fitness **NB power, strength and flexibility are in this question** **Application of knowledge, linking the component of fitness to hurdling (AO2):** • **Reaction time** (AO1) as he will need to respond to the stimulus of the starter's gun quickly (AO2) • **Speed** (AO1) so he can run quickly between the hurdles (AO2) • **Coordination** (AO1), so that he can move his upper body into the correct position whilst jumping the hurdles (AO2) • **Body composition** (AO1) as they will need the correct ratio of fat to fat free mass, so they are not carrying unnecessary 'fat' weight (AO2) • **Balance** (AO1) so that he can maintain good form while running/doesn't fall (AO2) **Evaluation of topic – making reasoned judgements about the importance of the component of fitness to the sprint hurdler (AO3):** • **Reaction time** (AO1) as he will need to respond to the starter's gun quickly (AO2) the quicker he responds/moves the more likely he is to get ahead of the opposition (AO3) • **Speed** (AO1) so he can run quickly between the hurdles (AO2) and get a faster time (AO3) • **Coordination** (AO1), so that he can move his upper body into the correct position whilst jumping the hurdles (AO2) Good foot-eye coordination approaching the hurdle, so he jumps at the right time to clear the hurdle (AO3) (accept other examples of upper body coordinating with lower body to achieve desired shape over the hurdle) • **Body composition** (AO1) as they will need the correct ratio of fat to fat free mass, so they are not carrying unnecessary 'fat' weight (AO2) the more muscle he has the more force he can generate to complete his race faster (AO3) (also allow	

	reference to low fat so less unnecessary body weight to carry slowing him down) • **Balance** (AO1) so that he can maintain good form/doesn't fall while running (AO2). Good dynamic balance as he takes off or lands means he doesn't lose time (AO3) Students who only show achievement against AO1 will not be able to gain marks beyond Level 1.	**(9)**

Level	Mark	Descriptor
	0	No rewardable material
1	1-3	• 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).
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3	7-9	• 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).