Pearson Edexcel

Mark Scheme (Results)

Summer 2019

Pearson Edexcel GCSE
In Physical Education Short Course (3PE0)
Paper 01 Theory

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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 A01 – 1 mark	Mark
1 (a)	**The only correct answer is B – Muscle B** ***A*** *is not correct because it is the quadriceps* ***C*** *is not correct because it is the tibialis anterior* ***D*** *is not correct because it is the hamstrings*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (b)	**The only correct answer is C - Flexion of the leg at the knee** ***A*** *is not correct because this is caused by the gluteus maximus* ***B*** *is not correct because this is caused by the quadriceps* ***D*** *is not correct because this is caused by the gastrocnemius*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (c)	**The only correct answer is A – Muscle A** ***B*** *is not correct because it works with the hip flexors* ***C*** *is not correct because it works with the gastrocnemius* ***D*** *is not correct because it cannot work antagonistically on its own*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (d)	**The only correct answer is C – Pulmonary vein** ***A*** *is not correct because it takes oxygenated blood away from the heart*	

	B *is not correct because it takes deoxygenated blood away from the heart* ***D*** *is not correct because it takes deoxygenated blood to the heart*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (e)	**The only correct answer is B – Platelets** ***A*** *is not correct because its function is transport* ***C*** *is not correct because they carry oxygen* ***D*** *is not correct because they fight infection*	**(1)**

Question Number	Answer A03 – 1 mark	Mark
1 (f)	**The only correct answer is B – High – low** ***A*** *is not correct because would be low oxygen after gas exchange at the muscles* ***C*** *is not correct because would be high oxygen before gas exchange at the muscles* ***D*** *is not correct because would be high oxygen before gas exchange at the muscles*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (g)	**The only correct answer is A – Bronchioles** ***B*** *is not correct because it is outside of the lungs* ***C*** *is not correct because it is outside of the lungs* ***D*** *is not correct because it is outside of the lungs*	**(1)**

Question number	Answer AO2 - 1 mark; AO3 -2 marks	Mark
2 (a)	For example: • The gymnast needs extension to occur at the elbow to achieve the position (1) this is possible because the biceps relax/lengthen (1) allowing the triceps to contract so the gymnast can extend their arms (1). • The antagonistic pair are the biceps and triceps/the muscles working together are the biceps and triceps (1) the antagonist relaxes (1) which allows the agonist to contract (1) Accept other appropriate responses. 1 mark for extension **<u>or</u>** identification of the antagonistic pair (AO2). 1 mark for analysis of agonist/tricep action (AO3). 1 mark for evaluation of antagonist/bicep role (AO3).	**(3)**

Question Number	Answer AO1 - 1 mark	Mark
2 (b)	1 mark for the correct classification of the bones of the wrist. • Short • Short bones DNA Small bones	**(1)**

Question Number	Answer AO1 - 2 marks; AO2 - 4 marks	Mark
2 (c) (i)&(ii)	 (Source: © Kjpargeter/Shutterstock) For example: • The skeleton provides **joints** (1) different joints allow different ranges of movement/a wide range of movement is needed to achieve this position (1) eg, the **hip** allows the gymnast to bend/move the legs upwards/ the knee straightens the leg/ the ankle allows them to point their toes (1) • The bones provide points for **muscle attachment/levers** (1) so that when the muscle **contracts** they **pull the bone**/cause the **bone** to move (1) for example the gastrocnemius causes the gymnast <u>to</u> plantar flex/point their toes. (1) • It provides **support** (1) which means the legs/lower body can be raised/removed from the ground (1) as the gymnast takes her **<u>weight</u>** on to her hands (1) Accept other appropriate responses. 1 mark for each function – joints/muscle attachment/support (AO1) 1 mark for each expansion explaining how this allows gymnast to move into this position. (AO2) 1 mark for each applied example. (AO2)	**(6)**

Question number	Answer AO2 - 1 mark; AO3 – 2 marks	Mark
3 (a)	NB – If answer is 'Fast twitch, for example, type 2a' – a mark can be given as fast twitch is first answer. However, no further credit would be given For example: Activity characteristic/what they need to do to achieve movement Fibre characteristic • Fast twitch/ type IIx (1) • to provide the required <u>force/power</u> for the movement/because the action is explosive/powerful/quick/a high intensity movement (1) • as this fibre type can **contract** powerfully/**contracts** quickly/**contracts** forcibly/**contracts** the quickest of the muscle fibre types. (1) Accept other appropriate responses. 1 mark for identification of fibre type (AO2). 1 mark for analysis of action, eg explosive/powerful/high intensity (AO3). 1 mark for justification of characteristic that makes fast twitch most suitable (AO3).	**(3)**

Qu Num	Answer AO1 – 4 marks	Mark
3 (b)	1 mark for each correct statement within the linked description. For example: • Blood flow is increased to active areas/blood is redistributed to <u>muscles</u>/away from inactive areas (1) • Increased by vasodilation/ widening of the <u>internal</u> diameter/widening of the <u>lumen</u> of the blood vessel (1) • and reduced blood flow to inactive areas (1) • reduced by vasoconstriction/ narrowing of the <u>internal</u> diameter/narrowing the <u>lumen</u> of the blood vessel. (1) Accept other appropriate responses. 1 mark for increased blood flow to active areas/ e.g. muscles	

	1 mark for vasodilation or correct description 1 mark for reduced blood flow to inactive areas / e.g. digestive system 1 mark for vasoconstriction or correct description	**(4)**

Question Number	Answer AO2 - 2 marks; AO3 - 1 mark	Mark
3 (c)	For example: • Necessary to transport oxygen to muscles/the muscles require **oxygen/more oxygen/** (1) so the player can continue to work aerobically/prevent anaerobic respiration/can break down lactic acid/remove lactate/prevent lactate accumulation (1) so they are able to work at a higher intensity for longer/delay fatigue (1) • Necessary to transport nutrients/oxygen/ the muscles require **nutrients/oxygen** (1) for energy during the game (1) so they are less likely to fatigue/so they can maintain performance (1) • The muscles require **removal of CO_2** (1) this is necessary as more CO_2 is produced during exercise (1) so the player's muscles are less likely to become fatigued/so they can maintain the quality of performance (1) • Redistribute blood to blood vessels near the surface of skin/reduce temperature (1) as heat is generated by muscles during the activity (1) so prevents dehydration/over-heating (1) Accept other appropriate responses. 1 mark for reason why vascular shunting is necessary during activity. (AO2) 1 mark for applied expansion (AO2) 1 mark for impact of this (AO3)	**(3)**

Question number	Answer AO1 – 3 marks; AO2 – 3 marks	Mark
4	For example: **(a) Short-term effect of exercise** Increased heart rate/stroke volume/ cardiac output Redistribution of blood flow (1) **(b) Importance to the performer exercising** Oxygen/nutrient delivery/transport More oxygen transported around body Increased gas exchange **at muscles** (1) **(a) Short-term effect of exercise** Increased temperature Muscle fatigue Lactate accumulation CO_2 increase Oxygen deficit (1) **(b) Importance to the performer exercising** Muscle elasticity/Increased range of movement at joint/less prone to muscle injury Reduced ability to perform (1) **(a) Short-term effect of exercise** Increased depth Increase in tidal volume Increased rate of breathing Increase in minute ventilation (1) **(b) Importance to the performer exercising** Increased oxygen **intake/to lungs** Improved gas exchange **at the lungs** Quicker removal of CO_2 (1) Accept other appropriate responses. NB Each cell to be mark independently. 1 mark for each identification of a short-term effect of exercise on named system (AO1) 1 mark for each linked application to the performer exercising (AO2)	**(6)**

Question Number	Answer AO3 - 1 mark	Mark
5 (a)	1 mark for the correct class of lever. • Second/second class/second order (1)	**(1)**

Question Number	Answer AO2 – 1 mark	Mark
5 (b)	1 mark for appropriate sporting example of lever system operating at the ankle. For example: • Blocking a shot/pass in netball/volleyball • Transference of weight to front foot to smash the shuttle • Sprinter/Swimmer leaving the blocks/at starting blocks • High jump at take-off Accept other appropriate responses.	**(1)**

Question Number	Answer AO1 – 1 mark	Mark
5 (c)	1 mark for correct statement of meaning of mechanical advantage. For example: • Allows a load to be moved with relatively small muscular effort. (1) Accept other appropriate responses.	**(1)**

Question number	Answer AO1 – 2 marks; AO2 – 2 marks	Mark
6 (a)	One mark for correct answer Axes	**(1)**
6 (b)	One mark for correct answer Frontal	**(1)**
6 (c)	One mark for correct answer Frontal axis (1)	**(1)**
6 (d)	One mark for each correct answer Vertical axis (1)	**(1)**

Question number	Answer AO1 - 2 marks; AO2 – 2 marks	Mark
7 (i)&(ii)	For example: • An individual could overtrain/suffer from injury/suffer from overuse injuries (1) for example shin splints/twist an ankle/tear a muscle. (1) • An individual's immune system could become less effective (1) meaning they will be more prone to illnesses such as colds and flu. (1) • If you use up more calories than you eat (1) you may become underweight/under your optimum weight (1) Accept other appropriate responses. 1 mark for each negative effect on **physical** health (AO1) 1 mark for each applied example (AO2)	**(4)**

Question number	Answer AO1 - 2 marks; AO3 – 1 mark	Mark
8	For example: • To see if they are improving (1) so that the individual knows they are training hard enough/not training too hard (1) otherwise the health benefits that were expected will not occur. (1) • Check there is progress/see if meeting targets (1) so they know that the training is working (1) and therefore know whether to change the programme/ use the results to plan what to do next (1) • To see if there is progress (1) which can be motivating (1) which will mean they are more likely to keep training/train harder (1) Accept other appropriate responses. 1 mark for reason for monitoring the training (AO1) 1 mark for expanding the reason (AO1) 1 mark for impact/importance (AO3)	**(3)**

Question number	Answer AO1 - 2 marks; AO2 - 2 marks	Mark
9 (i)&(ii)	For example: • Alcohol is a depressant/can lead to slower reaction times (1) which would mean the sprinter would be slower to react to the starting gun and therefore get a slow start (1) • Alcohol can cause an increase in weight (1) which would mean the sprinter had to carry additional/excess weight causing them to slow down. (1) Accept other appropriate responses. 1 mark for each example of effect of alcohol (AO1) 1 mark for each linked application of effect on sprinting performance (AO2)	**(4)**

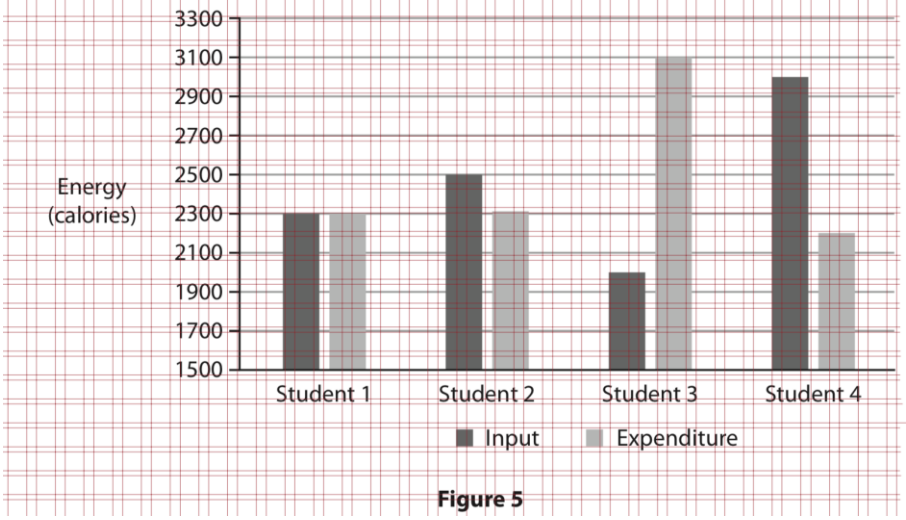
Question number	Answer AO1 - 3 marks; AO2 - 3 marks	Mark
10 (a)(i)&(ii)&(iii)	For example: **Physical health** • He would be less likely to become obese (1) due to the additional calories used during training. (1) • He would be less likely to have hypertension/high BP (1) due to an increase in his cardiovascular fitness from training. (1) **Emotional health** • He will feel good/feel happy (1) due the release of serotonin/endorphins (1) • Stress relief (1) as the training will take his mind off of other things that may have been worrying him. (1) • Increased self-esteem/confidence (1) as he will be getting better at his activity/meeting the targets he has set (1) **Social health** • Michael will have the opportunity to make new friends/stop being lonely/feeling isolated (1) as he trains with others/interacts with others/talks to others in training/meets other people at the club. (1) • Michael will learn to cooperate with others (1) as he will need to negotiate/work with others during training. (1) Accept other appropriate responses. 1 mark for each **specific** example of related health benefit (AO1) 1 mark for each expansion of how **specific** example achieved (AO2)	**(6)**

Question number	Answer AO1 - 1 mark; AO2 – 1 mark; AO3 – 2 marks	Mark
10 (b)	For example: • Carbohydrates provide the body with energy (1) we see from the table he is **increasing** the amount of carbohydrates he eats (1) this means he will have more glycogen/more **stored** energy for use (1), so he can maintain his race pace throughout the race/run without tiring/delay fatigue (1) • Michael will need a lot of energy to complete the 13-mile race (1) He can get energy from carbohydrates (1) and we see from the table he is carbohydrate loading (1) so he will be able to run the race without needing to slow down/run faster for longer (1) Accept other appropriate responses. 1 mark for role of carbohydrate (AO1) 1 mark for linking this to event (AO2) 1 mark for analysis of data in table (AO3) 1 mark for evaluation of impact of this on performance. (AO3)	**(4)**

Question number	Answer AO1 - 1 mark	Mark
11 (a)	For example: • The weight someone should be based on their physique (1) • A person's ideal weight/best weight for their activity (1) Accept other appropriate responses. 1 mark for correct statement of meaning of optimum weight (AO1)	**(1)**

Question number	Answer AO2 - 2 marks; AO3 - 2 marks	Mark
11 (b)	For example: **Optimum weight high jumper:** • The high jumper needs to be light (HJ) to lift their weight over the bar/clear the bar/lift off the ground (1) • The high jumper needs to be tall to make it to clear the bar/need less power to clear the bar/gives them a higher centre of gravity (1) **Comparison with other performers:** • They have a lower weight than rugby player who needs additional weight/muscle mass when tackling (1) • The jockey needs to be shorter/be a lower weight so the horse can go faster (1) • The HJ will be heavier **than the jockey** due to muscle mass so can jump with greater power/force (1) Accept other appropriate responses. Award 1 mark for linking each aspect of optimum weight to high jump (AO2) Award 1 mark for reasoned judgement why optimum weight differs to other performers (AO3).	**(4)**

Question number	Answer AO3 - 1 mark	Mark
12 (a)	• Student 3 (1)	**(1)**

Question number	Answer AO3 - 4 marks	Mark
12 (b)	**Figure 5** shows the students energy input and energy expenditure.  **Figure 5** For example: Student 1 (1) because their energy expenditure equals their energy input (1) therefore they will remain at the same weight/they will neither loose or gain weight (1) unlike students 2/4 who eat more calories than they use which would lead to weight gain (1) **Alternative for fourth marking point:** • unlike student 3 who does not eat enough calories to compensate for exercise therefore they will continue to lose weight, becoming underweight (1) • unlike the others who either eat too much compared to expenditure or too little Accept other appropriate responses. 1 mark for a judgement on which student is most likely to maintain a healthy weight. 1 mark for valid points based on analysis of the data in Figure 5 to support this judgement Award up to three marks for this analysis	**(4)**

Qu. Num	Indicative content (A01 – 3 marks; A02 - 3 marks for application; A03 - 3 marks for evaluation)	
13	Reward acceptable answers. Responses may include, but are not limited to, the following: **Knowledge and understanding of the respiratory system (A01).** Factual statements about the role/mechanisms associated with the respiratory system in relation to: **For example:** • RS breathes in oxygen /supplies oxygen • RS breathes out/removes carbon dioxide • During aerobic exercise the amount of carbon dioxide increases • Alveoli the site for gas exchange in the lungs • More oxygen is needed in exercise • Oxygen provides energy in aerobic exercise • Lactic acid will form/accumulate if there is not enough oxygen • Oxygen breaks down lactic acid/prevents build-up of lactic acid • If there is insufficient oxygen, oxygen deficit/debt can occur **Application of knowledge, linking the respiratory system to sport**. (AO2) **For example:** • **Serve** - the player will not use oxygen/the service action is explosive/anaerobic (AO2) • **Rally** - the players breathing rate will increase/the player's depth of breathing will increase (AO2) • **Rally** - the player needs **more** oxygen **for increased** energy production/ the player needs **more** oxygen for increased aerobic respiration (AO2) • **Resting** - the players breathing rate/breathing depth will be maintained/ higher than at rest (AO2) • **Resting** - the respiratory system repays the oxygen debt (AO2) **Evaluation of topic** – making reasoned judgments about the importance of the respiratory system throughout the varying intensities of the match. (A03) **For example:** • **Serve -** Oxygen is used to provide energy aerobically (AO1), when serving, the player will not use oxygen/the service action is explosive/anaerobic (AO2) therefore at the time of serving the importance of the respiratory system is minimal as he doesn't need to take in oxygen (AO3) • **Rally -** The lungs take oxygen into the body (AO1) so there is more oxygen available for the tennis player to increase energy production oxygen (AO2) this is important because it makes sure he has the energy to maintain the long rallies/delays fatigue helping him maintain quality of play (AO3)	**(9)**

	• **Rest –** Lactic acid will form if not enough oxygen (AO1) the elevated breathing rate allows the player to remove lactate that has developed during the long rallies (AO2). This is important otherwise their muscles will fatigue more quickly making them too tired to play well (AO3) Each AO carries a maximum of three marks.	

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 conclusions, 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 valid and well-reasoned conclusions supported by relevant evidence (AO3 – evaluation).