Mark Scheme (Final)

Summer 2018

Pearson Edexcel GCSE

In Physical Education (1PE0)

Paper 01 Fitness and Body Systems

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Summer 2018
Publications Code 1PE0_01_1806_MS*

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 C – Short bone** ***A*** *is not correct because it is used as a lever* ***B*** *is not correct because it is used for protection or muscle attachment* ***D*** *is not correct because it is used for protection or muscle attachment*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (b)	**The only correct answer is C – Cervical** ***A*** *is not correct because this bone is not part of the vertebral column* ***B*** *is not correct because this bone is not part of the vertebral column* ***D*** *is not correct because this bone is not part of the vertebral column*	**(1)**

Question Number	Answer A01– 1 mark	Mark
1 (c)	**The only correct answer is D – Hinge** ***A*** *is not correct because the knee is a hinge joint* ***B*** *is not correct because the knee is a hinge joint* ***C*** *is not correct because the knee is a hinge joint*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (d)	**The only correct answer is A - Join bone to bone** ***B*** *is not correct because this is a tendon* ***C*** *is not correct because ligaments join bone to bone they do not attach to tendons* ***D*** *is not correct ligaments join bone to bone they do not attach to muscle*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (e)	**The only correct answer is C – Aorta** ***A*** *is not correct because this vessel returns blood to the heart* ***B*** *is not correct because this vessel takes blood to the lungs* ***D*** *is not correct because this vessel returns blood to the heart*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (f)	**The only correct answer is B – Alveoli** ***A*** *is not correct because this transports gases rather than exchanges them* ***C*** *is not correct because this transports gases rather than exchanges them* ***D*** *is not correct because it is a muscle responsible for the mechanics of breathing not gas exchange*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (g)	**The only correct answer is B – Anabolic steroids** ***A*** *is not correct because they reduce heart rate* ***C*** *is not correct because they mask other drugs* ***D*** *is not correct because they reduce pain*	**(1)**

Question Number	Answer A01 – 1 mark	Mark
1 (h)	**The only correct answer is B – Erythropoietin (EPO)** ***A*** *is not correct because they reduce fatigue/increase alertness* ***C*** *is not correct because they increase strength* ***D*** *is not correct because they reduce heart rate*	**(1)**

Question number	Answer AO1 - 3 marks	Mark
2 (a)	One mark for each correctly identified muscle. NB muscles must be stated in this order. **(a) Muscle** A – Biceps (1) B – Hamstrings (1) C – Gastrocnemius (1) Accept other appropriate responses.	**(3)**

Question number	Answer AO1 - 3 marks	Mark
2 (b)	One mark for each correctly stated role. NB must be stated in this order. **(b) Role of the muscle** A – Flexes the arm at the elbow (1) B – Flexes the leg at the knee (1) C – Plantar flexion at the ankle (1) Accept other appropriate responses.	**(3)**

Question number	Answer AO2 - 2 marks; AO3 - 2 marks; AO3 - 2 marks	Mark
3	**Elbow (max 3 marks)** For example: • In the picture there is extension <u>at the elbow</u> (1) this is possible because the triceps have contracted (1) however, this is only possible because of the antagonistic muscle action of the biceps which relax (1). • Triceps contract/act as agonist (1), biceps relax/act as antagonist (1) causing <u>extension at elbow</u> (1) **Hip (max 3 marks)** For example: • In the picture there is <u>flexion at the hip</u> (1) this is possible because the hip flexors contract (1) however, this is only possible because of the antagonistic action of the gluteus maximus which relaxes (1). • Hip flexors contract/act as agonist (1), gluteus maximus/gluteals relax/act as antagonist (1) causing <u>flexion at hip</u> (1) Accept other appropriate responses. For each joint: 1 mark for joint action occurring at named joint 1 mark for action of agonist 1 mark for action of antagonist	**(6)**

Question number	Answer AO2 - 2 marks; AO3 - 2 marks; AO3 - 2 marks	Mark
4	**Slow twitch (max 3)** • The steeplechase athletes require slow twitch/type I muscle fibres when running (1) as this fibre type is: resistant to fatigue/has a high aerobic capacity/needed when running for a sustained period of time (1) allowing the athlete to complete the 3000m without (the muscles) fatiguing/needing to slow down (due to fatigue) (1). **Fast twitch (max 3)** • When jumping during the race the steeplechase athletes require fast twitch/type II(x)/2x muscle fibres (1) as this fibre type can contract powerfully (1) giving them the height needed to clear the hurdle/allowing them to jump the hurdle without clipping it/clear the hurdle quickly/not lose time clearing the hurdle (1). Accept other appropriate responses. 1 mark for correct link between the muscle fibre type and part of race (AO2) 1 mark for analysis to determine relevant characteristic of fibre type (AO3) 1 mark for impact of this on completing the stated action (AO3)	**(6)**

Question number	Answer AO1 - 1 mark; AO2 - 1 mark	Mark
5 (a)	1 mark for the role of platelets to prevent blood loss and 1 mark for this being important to allow the boxer them to continue in the match or equivalent example from appropriate sport. For example: • Platelets clot the blood/stem blood flow/form a scab (1) • so the boxer can continue (with the bout/training) (1) Accept other appropriate responses.	**(2)**

Question number	Answer AO1 – 1 mark	Mark
5 (b)	1 mark for correctly stating function of plasma. For example: • Transport (system) (e.g. nutrients to cells; waste, e.g. urea) (1) • Maintains blood pressure/blood volume (1) • Regulates body temperature (1) Accept other appropriate responses.	**(1)**

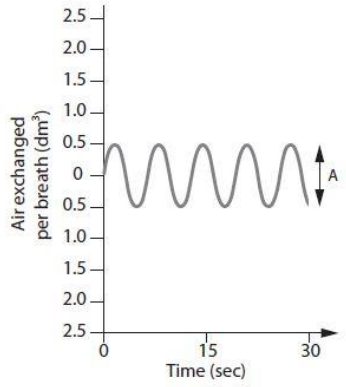
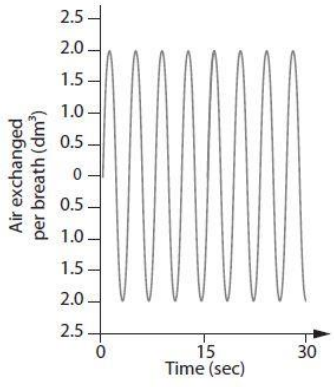
Question number	Answer AO1 – 1 mark	Mark
5 (c)	1 mark for stating internal diameter/lumen reduces in size. For example: • Narrowing/decreasing/constriction of the (internal) diameter/lumen • Narrowing of the blood vessel/arteries/arterioles (1) Accept other appropriate responses.	**(1)**

Question Number	Answer AO1 - 2 marks; AO2 - 2 marks	Mark
5 (d)	For each method and example: 1 mark for stating method to reduce risk and 1 mark for applied example to boxing match/boxer. For example: • Use protective clothing/ equipment (1) for example boxing gloves/padded post around ring (1) • Adherence to the rules/official (1) for example no hitting below the belt (1) • Check clothing/equipment (1) for example wiping glove surface to remove any debris (1) • Check facilities (1) for example the ring is dry (1) Accept other appropriate responses e.g.	**(4)**

Question number	Answer AO3 - 2 marks	Mark
6 (a)	1 mark for analysis of data in Figure 5 and 6 in relation to oxygen levels and 1 mark in relation to carbon dioxide levels. **Oxygen – one mark for any ONE of the following:** For example: • More oxygen inhaled (than exhaled) • Oxygen levels decrease when exhaling by 5% • Breathes in 21% of oxygen <u>but</u> breathes out 16% **Carbon dioxide – one mark for any ONE of the following:** For example: • More carbon dioxide is exhaled (than inhaled) • Carbon dioxide levels increase when exhaling from 0.04% to 4% (1) • Breathes out 4% of CO_2 <u>but</u> breathes in 0.04% Accept other appropriate responses.	**(2)**

Question number	Answer AO1 - 2 marks; AO2 - 2 marks	Mark
6 (b)	For each change in composition of exhaled air: 1 mark for the reason for the change in composition of the runner's exhaled air and 1 mark for appropriate expansion. For example: • Oxygen is used/needed/required (1) in <u>aerobic</u> respiration/to release energy (1) • CO_2 is a waste product/is produced (1) during <u>aerobic</u> respiration/during exercise/by the <u>working muscles (during exercise)</u> (1) Accept other appropriate responses.	**(4)**

Question Number	Answer AO3 – 1 mark	Mark
6 (c)(i)	1 mark for the correct identification of tidal volume. • Tidal volume (1) • Tidal (1)	**(1)**

Question number	Answer AO2 – 2 marks; AO3 – 2 marks	Mark
6 (c)(ii)	 **Figure 7 - At rest**  **Figure 8 - During exercise** For each reason: 1 mark for stating relevant change in breathing and 1 mark for linking to feature in Figure 8. For example: • Shows an increased breathing rate (1) as lines on graph/waves are getting closer together (1) • Shows increased depth of breathing/tidal volume (1) by: the lines becoming much deeper on the graph/increase from 0.5 dm^3 to 2.0 dm^3 (1) Accept other appropriate responses.	**(4)**

Question number	Answer AO3 – 2 marks	Mark
7 (a)	Maximum 2 marks for linking components stated in equations in Table 2 to appropriate type of respiration. For example: **Marking point 1:** • Because statement A includes oxygen/because statement B does not mention oxygen (1) **OR** • Because oxygen is required in aerobic energy production/not required in anaerobic respiration (1) **Marking point 2:** • Because the by-product of anaerobic respiration is lactic acid/lactic acid is not produced during aerobic respiration (1) • Because the by-product of aerobic respiration is carbon dioxide/water (1) Accept other appropriate responses.	**(2)**

Question number	Answer AO2 – 4 marks; AO3 – 2 marks	Mark
7 (b)	For example, (max 3 marks per example): • Transporting oxygen (1) so the cyclist can: work aerobically/remove lactic acid/produce energy (1) so they will not need to reduce their pace or rest/delay fatigue (1). • Remove/transport carbon dioxide/transporting lactic acid (to liver) (1) produced during exercise (1) otherwise if too much accumulates the cyclist will begin to fatigue and therefore would need to slow down and recover (1). • Transporting nutrients (1) to be used to generate energy (1) to fuel the muscles for their activity allowing the cyclist to continue to cycle the long distance at the required pace (1). Accept other appropriate responses. **For each function:** 1 mark for selecting function appropriate to question context (1) 1 mark for linking function to event (1) 1 mark for justifying how this enables the cyclist to perform well (1).	**(6)**

Question number	Answer AO1 – 3 marks	Mark
8 (a)	1 mark for each correct identification of a component of a lever system. Up to a maximum of 3 marks. **NB Accept in any order** • Fulcrum/Pivot (1) • Load/resistance (1) • Effort/force (1)	**(3)**

Question number	Answer AO1 – 2 marks	Mark
8 (b)	1 mark for identifying the mechanical disadvantage and 1 mark for explaining why this disadvantage occurs. • Cannot lift as heavy loads with the same amount of effort as other levers (1) due to the position of the effort and load from the fulcrum (1) • Large effort has to be applied to move a (relatively) small load (1) because the load arm is longer than the effort arm/ the load is further from the fulcrum than the effort (1) Accept other appropriate responses.	**(2)**

Question number	Answer AO2 – 2 marks	Mark
9 (a)		**(2)**

Movement pattern	(a) Plane	(b) Axis
Tucked somersault	Sagittal (1)	Frontal (1)

Question number	Answer AO2 – 2 marks	Mark
9 (b) GRAD		**(2)**

Movement pattern	(a) Plane	(b) Axis
Full twist	Transverse (1)	Vertical (1)

Question number	Answer AO1 – 3 marks	Mark
10 (a)	1 mark for each correct identification of the component of fitness from the description.	**(3)**

(a) Component of fitness being described
Cardiovascular fitness (1)
Agility (1)
Balance (1)

<table>
<tr><th>Question number</th><th>Answer
AO2 – 3 marks</th><th>Mark</th></tr>
<tr><td>10 (b)</td><td>1 mark for each appropriate application of use of stated component of fitness in sport
For example:

<table><tr><th></th><th>(b) Specific example of use in sport</th></tr><tr><td>(Cardiovascular fitness)</td><td>Marathon running (1)</td></tr><tr><td>(Agility)</td><td>Dodging /avoiding a tackle (1)</td></tr><tr><td>(Balance)</td><td>A gymnast doing a handstand (1)</td></tr></table>
Accept other appropriate responses.</td><td>(3)</td></tr>
</table>

<table>
<tr><th>Question number</th><th>Answer
AO1 – 2 marks</th><th>Mark</th></tr>
<tr><td>11 (a)</td><td>Any two of the following (any order):

<table><tr><th></th><th>(a) Phase</th></tr><tr><td>1</td><td>Pulse raiser (1)</td></tr><tr><td>2</td><td>Stretching/Mobilisation (1)</td></tr><tr><td>3</td><td>Skills practice/drills (1)</td></tr></table>
Accept other appropriate responses.</td><td>(2)</td></tr>
</table>

<table>
<tr><th>Question number</th><th>Answer
AO2 – 2 marks</th><th>Mark</th></tr>
<tr><td>11 (b)</td><td>Any two of the following:

<table>
<tr><th></th><th>(a) Phase</th><th>(b) Benefit to performer</th></tr>
<tr><td>1</td><td>Pulse raiser (1)</td><td><u>Increase</u> oxygen delivery to working muscles (1)</td></tr>
<tr><td>2</td><td>Stretching/ mobilisation (1)</td><td><u>Increase</u> muscle temperature (1)
Increase range of movement</td></tr>
<tr><td>3</td><td>Skills practice /drills (1)</td><td>Practice skills/movements used in the game (1)</td></tr>
</table>

Accept other appropriate responses.</td><td>(2)</td></tr>
</table>

Question Number	Indicative content (A01 – 3 marks; A02 - 3 marks; A03 - 3 marks)	Mark
12	Reward acceptable answers. Responses may include, but are not limited to, the following: Knowledge and understanding of training methods/long-term effects (A01) • Factual statement about training method, for example, interval training involves periods of high intensity work followed by rest periods for recovery • Links made between the stated training methods and adaptations, for example, Fartlek training can cause a drop in resting heart rate Application of knowledge, linking training methods/long-term effects to sprinting (A02) • The sprinter needs power from plyometric training (AO1) for an: explosive start; drive/push from the blocks; to accelerate (AO2) • Fartlek training will improve cardiovascular fitness (AO1) which is not required by the sprinter as their race is short duration (AO2) • Interval training at high intensity will increase speed, (AO1) so the sprinter can complete the race in a quicker time (AO2) • Interval training at high intensity will cause adaptations to fast twitch muscle fibres (AO1). Evaluation of topic – making reasoned judgments about the value of the training methods and their adaptations to sprinting (A03) • Plyometrics involves depth jumping (A01), which helps the sprinter develop power needed for an explosive start; drive/push from the blocks; to accelerate (A02) without power the sprinter cannot exert as much force and therefore cannot accelerate as quickly at the start making them slower than their opponents, therefore plyometrics is of value in a training programme (A03) • Plyometrics causes an increase in stored energy in the muscle (A01) which allows the sprinter to accelerate faster/accelerate for longer (A02) as the sprinter can create more powerful muscle contractions due to the increase in immediately available energy reserves in the muscle (A03) • Fartlek training will improve cardiovascular fitness (AO1) which is not required by the sprinter as their race is short duration (AO2) The only value would be if they included lots of hill runs to increase intensity otherwise this could be detrimental to his performance, slowing him down (AO3) • None of the methods develop reaction time (AO1), which is essential for a sprinter to move out of the blocks as soon as the gun sounds (AO2) therefore the sprinter should also include reaction time training so that all required aspects of fitness are trained within their programme (AO3). Students who only show achievement against A01 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 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).

Question Number	Indicative content (A01 – 3 marks; A02 - 3 marks; A03 - 3 marks)	Mark
13	Reward acceptable answers. Responses may include, but are not limited to, the following: Knowledge and understanding of fitness testing (A01) • Links made between the stated components of fitness and relevant fitness test, for example, the 30m sprint tests speed • Ref to omission of fitness test for strength/irrelevance of one-minute press-up test for stated components Application of knowledge, linking fitness test or component of fitness to canoeing (A02) • The canoeist needs speed in the arms so that they can paddle quickly • The canoeist will need flexibility to get a good range of movement at the joints when paddling to get a better technique so they can go faster • Canoeists could use the one-minute press-up test to measure the muscular endurance in their arms (A01) as they also need this to keep paddling/keep using their arms (muscles throughout the race) (A02) Evaluation of topic – making reasoned judgments about the suitability of the tests (A03) • The 30m sprint test measures speed (A01), canoeists need speed in their arms to paddle quickly (AO2) therefore it is not a suitable test as measures speed in their legs rather than the arms (that is required to be successful in canoeing) (A03) • Useful to measure flexibility via the sit and reach test (A01) as the canoeist will need flexibility to get a good range of movement at the joints when paddling. This will give them a better technique/more efficient stroke so they can go faster (A02) therefore out of these tests this is the most relevant as it (tests flexibility and) mimics the movement in canoeing (A03) • The one-minute press-up test measures muscular endurance. (A01) as they also need this to keep paddling/keep using their arms (muscles throughout the race) (A02) however this does not measure strength therefore the grip <u>dynamometer</u> test would be a better test to use (A03) Students who only show achievement against A01 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 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).