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Pearson Edexcel GCSE  
In Physical Education (1PE0)  
Paper 01: Fitness and Body Systems

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## **Introduction**

This was the third series for this qualification. The level of difficulty of the paper was in-line with the previous series, with candidates and centres showing good preparation, achieving a range of marks across all questions.

The paper begins with some multiple-choice questions; these are designed to be accessible for candidates. The main section of the paper is devoted to one, two, three or four-mark part questions (the question total might be larger than this, but the allocation of marks within the question will have been broken down into parts, e.g. part (a), (b) and so on).

The final section of the paper comprises two extended response questions. To access all available marks on 1PE0\_01, candidates need to recall knowledge and demonstrate understanding of this knowledge through its application to a range of question scenarios. They will need to demonstrate understanding and the higher-order skills of analysis and evaluation in the two, three, four and nine-mark questions.

Even with the limited entry of this series, it was pleasing to see the continued increase in the number of candidates providing well-structured, well-organised responses even to the most challenging questions. Many candidates developed their ideas, following a point through in greater depth for the 'describe' and 'explain' questions, rather than only providing a more generalised approach to their responses, or unrelated statements of fact.

Most candidates attempted all aspects of the written examination, with fewer omitting questions than in previous series.

The performance on individual questions is considered in the next section of the report. The feedback on questions shows how questions were well answered and also how candidates could have improved their performance.

## **Question 2**

Candidates found this question very accessible. Most correctly identified the role of the skeleton in protecting the vital organs and went on to complete the example, that the cranium protects the brain if there is a clash of heads when heading the ball in football. Responses where all three marks were not achieved, tended to be because the brain was not identified in the final part of the question, stating the head instead. Candidates were also familiar with the role of platelets, to clot blood and white blood cells, to fight infection.

### **Question 3**

Candidates were asked to complete a table about possible ranges of movement at three different joints: pivot; hinge; ball and socket. Whilst many candidates correctly answered the question, the question was more challenging for others. Hinge joints were well known, the knee was often given as a correct example, however, some candidates were unable to state a range of movement possible at this joint, either stating an incorrect range, e.g. rotation or an incomplete range, e.g. flexion rather than flexion to extension. Part (b) proved more accessible than (a).

In part (c), candidates were given an image of a diver performing a handstand on the board at the start of his dive. Candidates were asked to explain the importance of short bones in the wrist for the diver in the image. Many candidates correctly identified the importance as weight-bearing, although fewer candidates then went on to apply this to the image, i.e. it allowed the diver to complete the handstand at the start of the dive.

### **Question 4**

In part (a), candidates were asked to identify a different energy source for anaerobic and aerobic exercise. The anticipated response was carbohydrates and fats, which was presented by a few candidates. Whilst the majority could identify carbohydrates or a form of carbohydrate, (acceptable for either exercise type but not both), fats were less well known. A popular incorrect response was the use of oxygen as an energy source for aerobic exercise. Part (b) was accessible for most candidates, with the majority correctly linking anaerobic exercise to lactic acid production. Many candidates gained both available marks for this part of the question explaining that this was due to a lack of oxygen.

### **Question 5**

This question centred on second class lever systems. In part (a) candidates were given an image of the take-off in a long jump and asked to explain why the lever system operating at the take-off foot in the image was classified as a second class lever system. Candidates clearly understood the requirements of the question, generally linking the gastrocnemius to the required effort and body weight as the load or resistance. Not all could accurately identify that this was a second class lever system due to the order of the components of the system (i.e. that the load/resistance was the middle component of the system). Some candidates identified the ankle as the lever rather than the joint near the ball of the foot. In (b), most candidates appreciated that there was a mechanical advantage because the effort arm was longer than the load/resistance arm so large weights could be lifted with a relatively small amount of effort.

## Question 6

This question asked about planes and axes of movement. Candidates were given two images, a cartwheel and a piked somersault and asked to state the plane and the axis of movement for each. Some candidates could clearly differentiate between the movements gaining maximum marks for this question, whilst others confused planes with axes.

## Question 7

This question focused on a high jump for its context.

In part (a), candidates were told that the antagonistic muscle pair was acting at the ankle during take-off and then asked to explain the importance of this antagonistic pair to the high jumper. Most correctly identified the gastrocnemius as the agonist/contracting muscle but fewer went on to give the importance of this in terms of generating power to reach greater heights. Aware that two marks were available for the question, several candidates instead described the antagonistic action of the tibialis anterior.

In (b), candidates were given three fitness tests and asked to identify the component of fitness being tested by each test. Most candidates correctly linked the sit and reach test to flexibility and the vertical jump test to power although some linked the Cooper 12-minute swim to either 'endurance' or muscular endurance rather than CV fitness/aerobic endurance.

In (c), the high jumper's ratings were added to each fitness test and candidates were asked to explain the most important component of fitness the high jumper should work on to improve performance. This question was generally well-answered, with most identifying an average rating in the vertical jump test as an issue with the high jumper's power, which needed improving so the high jumper could achieve greater heights.

In part (d), candidates had to decide which of the fitness tests was least relevant to the high jumper. Some candidates achieved all available marks for this question. There were incorrect and/or incomplete responses to this question, e.g. some candidates did not state the fitness test that was least relevant despite the question stating this as a requirement. Several candidates correctly identified the Cooper 12-minute swim as the least relevant test but did not go on to explain why.

Part (e) asked candidates to describe plyometric training. Many candidates accurately described the high-intensity exercise and gave an example of box jumping or equivalent, scoring two of the available marks. Few gained maximum marks due to the lack of reference to lengthening, then rapid contraction of muscles/eccentric and then concentric muscle contraction.

Part (f) asked candidates to justify why weight training would not be suitable for a high jumper. Most responses correctly focused on weight training increasing strength (rather than power) for one mark, although a few gained the expansion mark for justifying why strength was not useful to the high jumper.

### **Question 8**

Part (a) was a data question. Candidates were asked to analyse the split times of a marathon runner during training and predict what would happen to the runner's time over mile 13 based on the data for miles 1-12. Candidates correctly identified that the time was most likely to become even slower.

Part (b) asked candidates to use the data and justify why the runner needed to work on her CV fitness. Most candidates gained some marks for this question, many justifying by explaining how an improvement in CV fitness would increase her ability to use oxygen, reducing fatigue so her mile times would be more consistent thereby improving her overall time.

Part (c) asked candidates to explain a training method that could be used to improve the marathon runner's CV fitness. Many candidates correctly identified continuous or Fartlek as relevant training methods and went on to explain why. Whilst some credit was given for other training methods, such as circuit training - this training method is not specific to marathon running, further marks were difficult to achieve.

Part (d)(i) required candidates to explain one reason why an increase in alveoli would help improve the marathon runner's performance. Generally, this was well answered, with many candidates linking the increase in alveoli to increased gaseous exchange and therefore greater oxygen availability to allow a faster pace to be maintained.

Part (d)(ii) asked candidates to identify a further two training adaptations to the respiratory system. Several candidates identified training adaptations to the circulatory system rather than the respiratory system, e.g. drop in resting heart rate, increased resting stroke volume which did not access the marks available for this part of the question. Other incorrect responses focused on responses to training, e.g. increased breathing rate. Correct responses focused on increased lung capacity or increased strength of the respiratory muscles.

### **Question 9**

The context for question 9 was a weight training class.

Part (a) required candidates to state one reason why the class would be required to fill in a PARQ before exercising for the first time. Some candidates focused on the legal requirements and the potential for injury, confusing the PARQ with an

informed consent form. Many candidates correctly identified the need for the form to allow the teacher to check the medical history of the participants.

Part (b)(i) asked candidates to explain why the teacher would ensure the class stretched as part of a warm-up before the main session began. There were a variety of responses to this question, many accurately focusing on increasing the temperature of the muscle or pliability of the muscle to reduce the risk of injury. Incorrect responses considered other aspects of the warm-up, e.g. the pulse raiser or repeated the question words, which is not an explanation, e.g. to 'we warm up to warm the muscles', this was considered too vague for a mark.

Part (b)(ii) required candidates to state one purpose of a cool down. Most responses accurately linked to the removal of lactic acid or repaying the oxygen debt. A few incorrect responses focused on slowing the heart rate. To gain a mark for this type of response, it should state the heart rate would be gradually reduced (heart rate reduces without a cool down, the importance is that this is a gradual reduction).

Part (c) asked for two safety checks that should be carried out before teaching the class, therefore responses that focused on 'during the session' were not credited. Correct answers included checking the equipment was fit for purpose, that there was an appropriate space to work and no spillages on the floor from a previous session. Covid-19 related responses, e.g. the need for the equipment to be sanitised before the class began were also presented by candidates and gained the available mark for this question.

### **Question 10**

The question required candidates to complete a table about performance-enhancing drugs (PEDs), stating a sport or physical activity where the PED could present an advantage and what that advantage might be. The PEDs were erythropoietin (EPO) and anabolic steroids. Both types of drug seemed well known and were mainly correctly linked to the appropriate type of sport, i.e. EPO to CV events and anabolic steroids to power events. Where candidates correctly linked the drug to a relevant sport or physical activity, the advantage was also well known, e.g. EPO for a marathon runner to increase oxygen delivery, anabolic steroids for a weightlifter so they can train harder for longer increasing muscle mass/hypertrophy.

### **Question 11**

This is an extended response question. Extended response questions use levels based mark schemes. Each extended response question is designed to address the different Assessment Objectives (AOs) by enabling candidates to demonstrate their knowledge (AO1), apply their knowledge to the question context (AO2) and then analyse or evaluate based on the information they have already supplied (AO3).

Each extended response is marked out of 9. The marks are allocated evenly for each assessment objective, AO1 - knowledge; AO2 - application of knowledge and AO3 - analysis and evaluation. This means that to achieve maximum marks, the response must address all aspects of the question.

A different command word is used for the extended response questions, i.e. evaluate. The exact requirements for this command word can be found in the specification but it is used to provide an opportunity for candidates to look in-depth at the question so that they can meet each assessment objective (AO).

One AO is no more important than another. However, it is expected that before knowledge can be applied it will be stated and before a reasoned judgement can be made there has to be some information on which to make that reasoned judgement.

Candidates should think about making a point, developing it through the use of an applied example, and then make a reasoned judgement. For example, Q11 asks candidates to evaluate the importance of three different muscle fibre types during three different intensity periods of play in a basketball game: the tip-off at the start of the game, sprinting to the basket and jogging back to position.

A good way to approach this type of question, which was adopted by many candidates, would be to:

- take each of the intensities shown in the game and link it to the most relevant muscle fibre type for that intensity of work (AO2), for example, jogging back to position would be slow-twitch/type I muscle fibres
- use a relevant characteristic of this fibre type, e.g. low force production to show why this fibre type is most likely to be used at this intensity of play (AO1)
- make a judgement about whether this fibre type is important, for example, of the three muscle fibre types this probably the least important as they cannot be used to generate high force so would not be appropriate for sprinting. However, without them the other fibres would not have time for recovery, so they do have a role to play (AO3).

Marks awarded for this question varied, although many candidates did gain marks across each AO. AO1 knowledge marks were more readily gained for statements concerning type IIx fibres, e.g. fast/powerful contractions or type I, e.g. fatigue resistant.

Incorrect responses, rather than incomplete responses, tended to occur where candidates confused type IIx with type IIa, thinking type IIa were more explosive, thus linking that fibre type to the jump rather than type IIx.

Some candidates incorrectly referred to type IIb or type 1a.



These questions are designed to allow differentiation between responses. Type IIa is clearly the hardest of the fibres, but even so, many candidates scored highly on this question.

### **Question 12**

The second extended response question gave the context of the 110m sprint hurdles. Candidates were told that to do well in this event the athletes needed to be fast and also able to clear the hurdles as they ran. Candidates were also told that the sprint hurdlers had high levels of power, strength and flexibility and were asked to evaluate three other components of fitness the sprint hurdler would need to do well in his event.

As with Q11, a good way to approach this type of question, which was adopted by many candidates, would be to:

- identify three other relevant components of fitness (AO1)
- link this to how the component of fitness would be used in the event (AO2)
- make a judgement about how important this component would be to performance (AO3)

For example, reaction time would be needed to respond quickly to the starter's gun so the hurdler can leave the blocks quickly and get an early lead on his opponents

This question was well answered by many candidates. Those not achieving higher marks either evaluated the components of fitness already given in the question (power, strength, flexibility) or focused on less important components e.g. CV fitness, muscular endurance.

### **Paper summary**

Based on their performance in this examination, candidates are offered the following advice:

- Use appropriate technical language when answering anatomy or movement analysis questions, for example, a range of movement is flexion to extension rather than just flexion (Q03)
- Use the command words and number of marks available to help you decide the depth required in your response, for example, 'Describe' questions do not need an explanation or justification, just the main characteristics of something (Q07(e))
- Make sure you read questions carefully
- If asked to provide two of something make sure you use clearly different types of examples, for example, an energy source for two different types of exercise (Q04(a))

- If asked to explain why something is important (or not important) to a specific performance, ensure you apply your knowledge to this context (Q07(d))