# Examiners' Report
# Principal Examiner Feedback

## Summer 2024

Pearson Edexcel Advanced Level
In Physical Education (9PE0)
Paper 01 Scientific Principles of Physical Education

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**Generic Points**

Candidates were generally well prepared. There was more evidence of use of calculators in responses where appropriate, though these needed to be rounded accurately and have appropriate units attached. Extended answers were better structured than in previous years. There is still a reluctance to rote learn key terms in the glossary, and poor spelling cost people vital easier marks for key terms and definitions.

**Q01a/b**
The skeleton was not well known by all candidates. Being able to name and label all the parts of the body in the specification are simple marks. Candidates must also be able to spell these correctly too. Sections of the spinal column and functions needed to be learnt. The vast majority did not know this.

**Q02a**
Most candidates were able to name two bones at the elbow joint. However, again spelling errors lost candidates marks, particularly Humerus which was spelt as Humerous.

**Q02b**
This question was well answered with the large majority of candidates able to score maximally on this question. Most common answers were adduction, abduction, rotation and circumduction. Again, some marks were lost on spelling, especially adduction where the use of one 'd' was a common error.

**Q03**
Most candidates did not know what wave summation was, and some confused it with spatial summation. The specifics of how to summarise how it increased force output was a challenge. Those who did know were able to say that the next impulse came before relaxation occurred and peaks becoming stronger with each stimulation.

**Q04**
Advantages of the aerobic system tended to be long duration, no harmful bi products and the large ATP yield of 36-38 ATPs. Less marks awarded tended to be made about alternative energy sources being utilised.

**Q05a**
Most candidates knew this was 100N.

**Q05b**
Most candidates knew this was 20N.

**Q05c**
Most errors on this question came from candidates listing rather than describing the factors affecting fluid friction on the swimmer. The most commonly used answers were clothing such as a swimsuit or hat, shaving body hair and cross sectional area reducing resistance. If they

were not describing the effect that these items had then the marks could not be awarded. The most common incorrect answer was 'mass' with many thinking a heavier swimmer would have more fluid friction.

**Q06**
There was some confusion between troponin and tropomyosin from less able learners but the vast majority of candidates knew what each of these did in muscle contraction.

**Q07**
Answers did tend to focus inside the muscles and often scored one or two marks. The most common answers included hypertrophy, capillarisation, increased lactate threshold and more myoglobin. A few candidates misread the question and gave answers relating to the skeletal system rather than skeletal muscle such as bone density or strength of ligaments and tendons.

**Q08**
Candidates tended to try to answer this question by talking about energy systems which meant that some did not specify the fuels at all. This lost marks for quite a lot of candidates.

**Q09**
This was generally well answered with lots of candidates gaining high marks. The most common answers were increased stroke volume, heart rate and cardiac output, alongside the vascular shunt, and breathing rate. All points on the mark scheme were used by candidates.

**Q10**
This was well answered by a lot of candidates. Weaker answers were only able to outline one or two lever systems and did not go into the detail about where the fulcrum, effort and load were based. Sporting examples tended to be good but only the best candidates could correctly apply the mechanical advantage and disadvantage to sporting situation. An error seen was confusion about the elbow extension for first class with elbow flexion for third class.

**Q11**
This was generally well understood but only the highest scoring candidates were able to examine the specific things that were different at the start of exercise as opposed to rest. Some candidates did not focus on the respiratory system and so lost marks. Most common answers were increased tidal volume, breathing rate and gas exchange but there was less information on how this was achieved. Physiological responses were often not linked to functional changes. The very high scoring answers were few and far between.

**Q12**
There was some confusion over this extended response from more candidates than expected. Some read the word recovery and went into detail about specific types of recovery rather than focussing their response on the fast and slow components of recovery and the specific

application to different sports. Mid range answers were able to say what happens in fast and slow recovery but stronger answers then linked this to different types of sport or strategies in games to aid recovery.

**Q13**
The principal determinants of running performance were not generally well known. This is surprising as it has been asked as an extended response in the past and articles written on it in the Inside Track magazine.

**Q14**
This question was more demanding than anticipated. There were some lists of factors given that were not relevant with a number of candidates describing optimal weight for different sports rather than how an athlete would achieve optimal weight. Higher scoring answers were able to explain about energy balance and calories in equalling calories out. Fewer candidates were able to explain that you would eat more or less to adjust your energy intake or adjust your energy expenditure to achieve weight gain or loss.

**Q15a**
This definition was generally not well known. There are always marks available on the exam paper for knowledge of key definitions and they needed to be learnt.

**Q15b**
Many candidates were not able to identify factors determining an athlete's anaerobic capacity. Muscle mass, level of fitness and proportion of llx fibres were the most common answers when this was known.

**Q16**
When they knew the training method, candidates knew good examples of assisted training, particularly towing someone faster, or bungee running to pull you at a faster rate, downhill running was also a very common answer. Some candidates knew correct answers but listed rather than described so did not score marks. There were some candidates who confused assisted with resisted. Sometimes the same equipment was mentioned but the usage was incorrect, for example using a resistance band but being slowed down by it rather than being pulled faster.

**Q17a/b**
The vast majority of candidates knew how to complete this calculation, however some marks were lost by candidates using the incorrect units. This was more common in Q17b than in Q17a. Marks were lost too from incorrect rounding of answers.

**Q18**
Most candidates did not know accurately the protocol of the Margaria-Kalamen test. Those who did know it scored a range of marks with some knowing the protocol perfectly. However, sometimes they were not

specific for example saying time the athlete rather than timing begins on 3rd and ends on 9th step. Or saying warm up, rather than the warm up should familiarise themselves with the run up the stairs. There is often a protocol of a test in an exam paper and all tests in the specification must be known.

**Q19**
Candidates were familiar with FITT and could explain what it was but sometimes this was not specific to the question about how this is used to progressively overload. For example, candidates saying Frequency is how often you train and not that you would need to train more times in the week e.g. increasing from twice to three times.

**Q20**
Some candidates listed the factors and therefore could not score the marks, this question demanded a description of how it affected the flight. Some used the tennis ball in a game of tennis but some described throwing a tennis ball. Either was acceptable. Better answers could relate it to the context. For example, speed of release is factors - if the ball is not hit with enough speed then it will not reach the net but with too much speed it could go out of the back of the court.

**Q21**
For this question a lot of candidates knew some rehabilitation strategies but the better answers were able to examine the advantages and disadvantages and used more technical language about the physiological advantages of the strategies. The strongest answers used a variety of methods and compared them. A few answers focused only on RICE or POLICE and did not include any other contemporary methods of rehabilitation. Very few linked their rehab strategies to specific soft tissue injuries.

**Q22**
Stronger answers evaluated how useful particular methods of training were for athletes for maximal aerobic fitness. The best extended responses were able to balance different methods and explain why they were most applicable. They also showed that they knew the difference between maximal aerobic fitness and submaximal aerobic fitness. Sometimes candidates confused methods that were not the most appropriate for aerobic fitness, such as weight training and some candidates incorrectly spoke of fitness tests and not methods, therefore not scoring at all. Very few were able to link the different methods of training to different sports/athletes. There was a focus on pros and cons of methods rather than how suitable they are for different sports.

**Q23**
The most commonly seen responses included things like the weather, time of day, accuracy of timing. However, some candidates confused validity and reliability which is something to consider when teaching this area of the specification.

**Q24**

The best answers were able to focus on the preparation phase. Some candidates had technology examples but centred them on performance and not preparation, citing things like VAR and GPS technology in match play. The most common preparation answers were things like use of HR monitors in training, use of video analysis to look at technique and sometimes things such as climate chambers to prepare for different environmental conditions. The application of what is being done with this information was there for the highest scoring candidates who were able to go on to say why this was useful and what might change as a result of its usage. The best answers included application from across the specification: fitness and training, biomechanics, technique, skill acquisition, tactics.