GCSE
PHYSICAL EDUCATION

8582/1: The human body and movement in physical activity and sport
Report on the Examination

8582
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General comments

This was the second year of this examination and again, students found it challenging. The mean mark went up, which suggests that both teachers and students are becoming more accustomed to the demands of the paper. As in previous years, although many students demonstrated sound theoretical knowledge, they had a few problems interpreting the command words and therefore the assessment objectives being tested. This meant some students gave a lot of irrelevant information in their answers. Teachers should continue to prepare students in the interpretation of different command words and how these will relate to the assessment objectives and hence how the questions should be answered.

Questions 1 to 4

Questions 1 to 4 were multiple-choice questions. The level of difficulty varied with questions 03 and 04 being very accessible to all, whereas questions 01 and 02 proved to be more challenging.

Question 5.1

The students found this question challenging as many of them did not fully understand the question. Rather than simply stating the percentage of the one rep max and the appropriate number of repetitions that would be used to improve maximal strength, students explained the principles of overload.

Students who did understand that the weight loading used should be a percentage of the one rep max often failed to gain a mark, as the percentage stated was below 70%. Students who stated 'high weights and low repetitions' were awarded 1 mark and this was probably the most common way students gained marks.

Many associated the question to tennis and stated how being stronger would help them 'hit the ball more powerfully' which didn't answer the question set.

Question 5.2

This question was well answered with most students correctly identifying that the femur and tibia were two bones found at the knee.

Question 5.3

This question was also well answered with flexion being the predominant answer.

Question 5.4

This question was less well answered and students generally answered hamstrings or quadriceps.

Question 5.5

This proved a difficult question with only around 18% correctly identifying that the muscular contraction was an eccentric contraction.

Question 5.6

This question was poorly answered as the question required AO3 responses, whereas most students only gave AO2 responses.

Responses hinged around the differences between anaerobic and aerobic respiration, by relating to the presence or absence of oxygen (AO2). However, to be credited this needed to be linked to the effect (AO3) of maintaining muscular contractions over appropriate periods of time. Likewise, when stating the time element 'short or extended' periods of work (AO2) responses could not be credited unless referring to the intensity of the exercise (AO3).

Students succeeded in gaining marks by stating that if weight training was for improving strength then it would be anaerobic, and for muscular endurance it would be aerobic, giving examples of the intensity/weight and number of repetitions to be completed. However, many failed to give intensity, but instead stated 'sets' and therefore failing to gain marks.

A very small percentage of students expressed that weight training was only anaerobic. Quite often the quality of the response was of a high standard, suggesting they undoubtedly knew a lot about weight training; particularly when explaining why training for muscular endurance would also be anaerobic. These students could only be credited with 2 marks, as they had not 'discussed' aerobic as posed by the question.

One of the most common mistakes that students made was referring to maximum heart rates, instead of percentages of one rep max, when explaining the differences between anaerobic and aerobic work being undertaken.

When explaining why weight training was anaerobic, often producing lactic acid; it was not linked to the lack of oxygen available.

There was very little mention of the use of glycogen stores being used in anaerobic activity.

Question 5.7

The responses that the students gave showed a good understanding that the multi-stage fitness test was used to test cardiovascular endurance and how it would be administered; this constituted an AO2 response. This question asked for an evaluation as to the validity of the test related to a tennis player and, therefore, required the students to respond at AO3 level.

Most students gained credit for positive evaluation, by stating the relevance of the link between testing cardiovascular endurance and the tennis player needing good cardiovascular endurance to be able to perform for multiple sets, lasting for a long period of time. Some also identified the shuttle nature of the test replicating the player's movement on court during a game.

When students tried to show the negative (disagree) evaluation of the test, they were less successful. The best responses referred to the fact that it did not test for any skill related component of the game, such as serving or volleying.

Many students recognised that agility was not tested in the multi-stage fitness test. However, instead of explaining 'why' agility was important to the tennis player, which would then be acceptable as an AO3 response, they merely stated that the Illinois Agility test was used for agility, therefore not gaining any credit for their response. This was also true for other components of fitness.

Some students referred to the test as a method of training or training type or that the test was a test for multiple components of fitness.

Question 6.1

This question was answered well by most students. The most popular answers were large lumen, valves, and then thin walls.

Those that failed to gain full marks gave responses that related to the function of veins, ie carrying blood. The most common mistake was stating the walls were thick or merely stating thin or lumen.

Question 6.2

This question was very well answered.

Question 6.3

The most common reason that students failed to gain marks was that they drew a bar chart, despite the question asking for a line graph. The plotting of the skeletal muscles was mostly correct. Students varied in the way they tried to plot the other organs, which caused them to fail to gain credit. One main reason for this being that they failed to take on board the word combined in the question. The lines were sometimes plotted for each organ, or a wavy line linking different organs which had been plotted separately. Some students correctly marked the points but did not label them; hence they only gained 1 mark.

Question 6.4

This was generally a well-answered question with most students gaining 1 or 2 marks. The most popular response for 1 mark was ‘that working muscles require more oxygen’ (AO1). However, students often expanded this point by explaining what the impact of this would have on the body/performer, therefore producing an AO2/3 type response, which was not required.

Many students did not explain the fact that less blood was distributed to other organs, which would have gained them the second mark.

Question 7.1

This question was answered well by most students. The main reason that some students did not gain credit was forgetting to include ‘together’ or ‘same time’, only referring to two body parts moving.

Some students referred to being able to link up with other team members, ie coordinate with others to play well in a match.

A few students referred to being able to do two different things at the same time, therefore not referring to body parts. For example, marking an opponent and watching the ball in netball.

Question 7.2

Most students successfully gave examples of good coordination in hockey. Most responses referred to dribbling, coordinating running (legs) with holding the stick (arms). There were also a high number of responses that referred to hand/eye coordination, which was accepted.

A considerable number of students that referred to ice hockey, which was again accepted, although the question posed referred to field hockey, as only activities in the specification can be used in the questions.

The most common mistakes involved giving bad coordination as an example; this was not accepted as it did not answer the question posed of good co-ordination. Some incorrect examples related to agility, such as changing direction to avoid an opponent.

Some poorly expressed responses related to player awareness, such as where the other players are around you, which could not be credited. However, a very small percentage were qualified by further explanations of hand/eye coordination.

Question 7.3

Flexibility, balance or agility was stated in most responses, gaining most students 1 mark at AO1. Of these possible components of fitness, agility was the most popular response seen.

With all the possible responses, especially those relating to balance and speed, definitions were also often given. However, they did not gain further credit as it did not relate to the question posed of 'importance for a hockey player'.

The best AO2 responses were for agility where students gave the following statement; 'when a hockey player would need to change direction quickly to avoid being tackled'.

The responses that could not be credited were because the students failed to give the two elements of speed and direction. Typically, answers included those such as 'changing speed quickly' or 'move to avoid tackles'.

Some students did not receive any marks for this question due to giving a component of fitness that was stated in the question. Speed was the most common example of this.

Question 7.4

This was a very similar question to one set in 2018 but students still made a similar error to 2018 and the vast majority failed to gain a mark. The most common error with the responses given was stating 'increased breathing' or faster/deeper/heavier/quicker breathing.

Students may have been well taught and understand EPOC, but this simple use of one word is costing them to lose marks on this topic. Centres need to ensure that students use the term 'maintain' which is clearly stated in the specification.

The mark scheme also accepted continues/remains/stays as alternatives to maintain.

Question 7.5

This question was generally answered well by students with many references to gradually allowing the breathing rate or body temperature to return to a normal level. However, it is important that students do use terms such as gradually or slowly when referring to these two benefits of a cool down.

Preventing DOMS and muscle soreness was also frequently stated.

The removal of lactic acid was also correctly stated by many students. However, some students incorrectly referred to stopping lactic acid building up. This is a small error in the wording that students make. Centres need to be aware of this and to ensure students understand the difference between remove and stop, thus allowing their students to gain marks on the benefits of a cool down.

Many students also mentioned to prevent headaches, light headedness, nausea and injury. These were not credited.

Question 8.1

Nearly all students answered this question correctly and obtained full marks.

Question 8.2

This question was not well answered. Students often did not explain the process of gaseous exchange but rather explained the structure of alveoli, or explained the pathway of the respiratory system or double respiratory system instead.

It is clearly stated in both the specification and Teachers Notes' that students need to understand that the process of gaseous exchange takes place at the alveoli. This was not apparent from the many students who scored very low marks or no marks for this question. There were also a higher percentage of blank responses seen.

Not all students who scored marks understood the short diffusion pathway of gases moving either way between alveoli and capillaries, although capillaries was often not stated, with blood cells stated instead.

Some students did refer to the exchange of carbon dioxide and oxygen but they did not always explain clearly which moved where. Also, why this happened due to the differences in the concentration levels present in alveoli and capillaries. On this point, many stated it was oxygenated and de-oxygenated blood that diffused.

Some students wrote the correct process for oxygen and then stated 'the opposite happens to carbon dioxide'. This was too vague and was not credited.

Question 9.1

Most students gained the full 3 marks for this question.

Many students did refer to 'minerals'. However, in some instances wrongly stated that the function was the production of minerals instead of the storage of minerals.

The function of 'points for attachment' was not a common response but when students did mention it they always referenced to it as 'places for muscles to attach', which was credited.

Production of bone marrow was sometimes stated and, as this is not a function, it was not credited.

Question 9.2

This question produced responses that covered the full range of marks, but predominantly at the 1 mark level.

Students that did not score any marks explained where long bones were in the body and the relationship to forming joints and the type of movement produced ie gross movements. Some students expanded these statements with; that this would enable the player to move quickly or reach further to get to the shuttle and they did gain 1 mark for this AO2 explanation.

At the upper end of the mark range, students appreciated that because of the presence of long

bones, it enabled the player to gain more power in overhead shots and this in turn would be advantageous to outwit their opponent with a winning shot, such as a smash.

The ability to jump high could not be credited as this would be dependent on muscular power and not length of bones. Many referred to a ball rather than a shuttlecock.

It was also apparent that many students did not understand the command word, 'explain' and their answers were instead descriptive.

Question 10.1

Most students did draw an acceptable diagram.

The most common issue was the lack of labelling of the fulcrum. Although a triangle is the recognised symbol for a fulcrum, it needed to be named to gain credit.

The other reason that students did not score the mark was they omitted to show the direction of the effort arrow.

If students named the resistance as the load, this was accepted as correct.

Credit was given to students that only labelled the diagram with F/R/E, providing that the fulcrum and load symbols were correctly placed.

Question 10.2

This question was not attempted by a larger proportion of students. Those students that answered the question rarely gained the 2 marks available for this question.

Most students gained a mark for either stating that the effort arm is longer than the resistance arm or correctly giving the equation associated with this.

Students did not explain what this meant in terms of being able to lift a heavy load with ease/efficiently or stating that the mechanical advantage was greater than 1.

Many students tried to relate back to the generic statement given before the previous question about Greg Rutherford performing long jump, where the fulcrum, resistance and effort were enabling him to jump further. These responses failed to explain the mechanical advantage.

Question 10.3

This was a well-answered question with most students achieving full marks.

Spelling was sometimes poor, especially plantarflexion. However, poor spelling was not penalised.

Some students just stated flexion or extension, which did not gain any credit.

Question 10.4

Most students made a good attempt at this question.

Lower-scoring answers consisted mainly of the definitions of speed and muscular endurance, enabling them to obtain a mark at AO1 level. Some of students who gave these answers were also

able to apply (AO2) where this would be used in long jump. This was mainly when referring to the need to generate speed in the run-up. Very few students could do the same for muscular endurance. This distinguished between the 1 mark and 2 mark level responses.

Students who gave better answers identified the importance of speed helping generate power for the take-off and often developed this to evaluate the importance of speed to help generate distance and possibly a winning jump, thereby offering some evaluation of speed (AO3). Students also stated that the importance of speed on the run up was the major component of fitness required by a long jumper.

With muscular endurance, it was apparent that some students did not understand how this component of fitness is relatively unimportant in long jump. They often tried to justify it being of high importance by relating to the muscles having to repeatedly work/contracting whilst in the run-up phase. They obviously felt they had to agree to it being important rather than discussing that it is of lesser importance.

Even the more knowledgeable students struggled with this aspect. For this reason, there were limited responses that accessed the top marks of level 3.

Students who achieved the top mark level gave good detail of the importance of speed and justified that muscular endurance may be helpful to an elite long jumper. This was because they may have to compete over several rounds over a short period of time with little time for recovery or that it benefited them whilst training for the long jump as they could train for longer. These students would also mention that it was not as important as speed and that muscular strength was better as this combined with speed would help produce the power required at take-off.

A lot of the responses did not always reflect that the question referred to an elite athlete.

Question 10.5

This question was generally poorly answered.

Many students gave the explanations of what specificity and progressive overload meant when applied to an athlete's training programme. These consisted of mainly AO1 responses. Many students went into considerable detail on what the FITT principles were. This did not answer the question of 'how it can improve performance in the long jump'.

Students did not identify what aspects of the long jump could be improved, when considering these two principles to the training programme, such as focusing specifically on leg muscles work to improve take off or increasing the intensity to improve power at the take off.

Some students used examples of plyometric training for specificity but did not relate this back to the 'jumping' nature of the event, merely stating it would be a good method of training.

A common response was that 'Greg could keep lengthening the distance he jumps when practising', assumedly this was to show progressive overload.

Question 11

Students who failed to gain marks on this question, only gave the definitions of Health and Fitness. However, the question did not ask to state a definition.

The question asked for examples. Therefore, those students who did give examples invariably

scored the 2 (AO2) marks.

The examples given of being fit, demonstrated a person being able to participate in a wide variety of sporting activities, requiring good fitness eg the ability to play football for 90 minutes. Some students also repeated the question by simply stating a sportsman may be fit**,** and therefore did not gain a mark as there was no example given.

Examples of not being healthy mainly covered mental illness such as depression, the inability to socialise and lacking a good diet and therefore being obese. Some mentioned drug or alcohol problems. There were fewer mentions of illnesses/health-related problems. Where students gained 1 mark, it was invariably in this section of the question.

Question 12.1

This was extremely well answered with most students knowing that maximum heart rate is 220 – age.

Question 12.2

This question was well answered by the students with most students showing some understanding of the relationship between improved explosive strength and the effect on performance.

If students implied that the result of improved explosive strength was being able to kick, throw or jump further or higher than they were previously able to do, they gained a mark. However, some did not do this. This was especially the case with responses related to heading, where students often just wrote ‘able to jump high for a header’. This could not be given a mark as there was no improvement implied.

Some students showed better interpretation of the question and understanding of explosive strength and the link to power. For example, a footballer being able to respond quickly from a stationary position, in a situation that required them to sprint into space or outpace an opponent to receive a pass. The most common responses were to kick the ball harder, to jump higher to win a header and to throw the ball further from a throw in.

Examples relating to Goalkeepers diving to save a shot often lacked the adjective of quicker or further.

The one area which was noticeably weak was when students gave examples of tackling, holding off a player or one on one contact situations during the game, where the example given related to strength and not explosive strength.

Question 12.3

Most students scored the mark for this question.

The understanding of Fartlek consisting of periods of differing intensities was often given as sprint, walk, jog sprint etc. with fewer using the terminology of intensity. Many students also mentioned changes in terrain.

A small number of students just stated speed play; this was only accepted if qualified with some reference to the changing intensities.

Some students stated that it was a form of continuous or interval training. Neither of these responses were credited.

Question 12.4

This question was not attempted by many students.

Some students often failed to discuss both the positives and negatives of this training method. Therefore, if only the positives were considered the students would not gain full marks. However, most of the responses did access the AO3 requirement of this question.

When responding in favour of Fartlek training, students highlighted the similarities of the changing intensities of the training and that, in the game situation, players must sprint in some situations and are jogging in others. However, few students linked this directly to both anaerobic and aerobic fitness. Many gained a mark for the fact that it is inexpensive, requires no specialist equipment and can be undertaken as a group or team.

Referring to improving cardiovascular endurance, when undertaking Fartlek, was linked to the ability to play at a good standard throughout the game.

There were some very unusual links made to the changing terrain aspect of Fartlek. Comparisons to different types of surfaces that football could be played on was given as a positive in the discussion. Very few identified this as a negative. As football is played on a flat pitch, it is therefore not such a suitable training method.

When discussing other negative points, the only creditworthy responses related to lack of football specific skills covered in Fartlek training. Students often followed this point up with suggested alternative training methods, which did not receive any credit.

The only other commonly quoted negative was that Fartlek training might not be motivating. Again, this was not accepted, as this could apply to any training type.

Question 12.5

Most students answered this question well and scored the mark.

The most frequently stated response was; ‘the cranium protects the brain when heading the ball’.

The most common failing was when students did not state what organ was being protected. This was more common with cranium and brain. An example of this would be ‘cranium protects you when heading the ball’. An example of this with the ribs would be ‘the ribs protect you when chesting the ball’.

A very small number of students did not state the physical activity in football.

Question 13

Students of all abilities appeared to be able to provide a response to this question. However, the attainment level was heavily distributed towards the middle to lower end, rather than middle to top.

All students that attempted the question showed that they had some knowledge (AO1) of continuous training. Explaining that it is aerobic exercise carried out over a sustained period of time and that it helps to improve cardiovascular fitness. Having stated these facts, students were able to access the lowest mark band (Level 1).

When applying (AO2) this knowledge to Gary in particular, many understood that it would be a

suitable training method to undertake. Good cardiovascular fitness would be essential in road cycling as it is an activity that is undertaken for a sustained period and, therefore, would help Gary to keep going in a race.

Many students at this point included the principles of training, especially explaining how overload (FITT) could be applied to continuous training. Often there was a very limited link to Gary using this method of training for cycling.

When students evaluated (AO3) appropriateness of continuous training, many only considered the advantages and disadvantages based on cost, equipment and Gary being able to train on his own.

More detailed answers contained the explanation that the positive benefits of this training method would be to improve Gary's ability to maintain pace in hill climbs and keep up with the peloton. They also contained reference to Gary's knee injury problems from basketball and suggested that using a bike for continuous training would be less likely to aggravate the injury.

It was also a common response that students stated that Fartlek training on a bike would also be a very suitable alternative training method. This would replicate times when the intensities or terrain changed during a cycling race.

Those students that had devoted a lot of time explaining the principles of training at AO2 explained that this training may become tedious for Gary. However, there was little reasoning as to how this affected the appropriateness to justify awarding credit at AO3 level.

Many students had failed to make their responses relate to Gary taking up competitive cycling but concentrated more on his age. This was particularly so when coming to an overall conclusion about the appropriateness of the training, suggesting that it might be difficult, if not dangerous, for him to undertake at the age of 44.

Use of statistics

Statistics used in this report may be taken from incomplete processing data. However, this data still gives a true account on how students have performed for each question.

Mark Ranges and Award of Grades

Grade boundaries and cumulative percentage grades are available on the Results Statistics page of the AQA Website.