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GCSE  
**PHYSICAL EDUCATION**  
**8582/1**

Paper 1 The human body and movement in physical activity and sport

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**Mark scheme**  
June 2019

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Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this mark scheme are available from [aqa.org.uk](http://aqa.org.uk)

## Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

### Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, i.e. if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

### Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

0 1

Which **one** of these describes the transverse axis of rotation?

[1 mark]

**Marks for this question: AO1 = 1**

**B – The axis that passes horizontally through the body from left to right**

0 2

Which **one** of these uses an isometric contraction?

[1 mark]

**Marks for this question: AO2 = 1**

**B – A plank**

0 3

Which **one** of these best describes pre-season training?

[1 mark]

**Marks for this question: AO1 = 1**

**B – When performers improve their fitness**

0 4

In which **one** of these activities is reaction time most important?

[1 mark]

**Marks for this question: AO2 = 1**

**D – Table tennis**

0 5 . 1

Alex is a professional tennis player and is using weight training to improve his strength.

Outline **two** ways in which Alex can use his one rep max to help improve his maximal strength.

[2 marks]

**Marks for this question: AO1 = 2**

Award **one** mark for each of the following points up to a maximum of **two** marks.

- Needs to be working at or over 70% of one rep max (1)
- Low number of repetitions (e.g. 4-8 repetitions) (1)

Accept any other suitable way in which Alex can use his one rep max to improve his maximal strength.

**Maximum 2 marks**

0 5 . 2

Which **two** of the following bones are found at Alex's knee?

[2 marks]

**Marks for this question: AO1 = 2**

**A and D – Femur and Tibia**

0 5 . 3

In order to improve the strength in his legs, Alex performs some squats as shown in **Figure 1**.

Identify the **joint action** at the knee as Alex performs the downward phase of the squat.

[1 mark]

**Marks for this question: AO2 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- Flexion (1)

**Maximum 1 mark**

0 5 . 4

Identify the **main agonist** at the knee as Alex performs the downward phase of the squat.

[1 mark]

**Marks for this question: AO2 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- Quadriceps (1)

**Maximum 1 mark**

0 5 . 5

Identify the **muscular contraction** at the knee as Alex performs the downward phase of the squat.

[1 mark]

**Marks for this question: AO2 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- Eccentric (1)

**Maximum 1 mark**

0 5 . 6

Discuss whether weight training is an aerobic or anaerobic activity.

[3 marks]

**Marks for this question: AO3 = 3**

Award **one** mark for each of the following points up to a maximum of **three** marks.

**Anaerobic – (sub-max 2 marks)**

- Weight training is usually a high intensity (heavy weights/low reps) which means it can only be performed over a short period of time (1)
- Lactic acid may be produced due to a lack of oxygen available to the muscles (1)
- Body uses blood sugar and/or glycogen stores as an energy source to perform the exercises (1)

**Aerobic – (sub-max 2 marks)**

- Weight training can be at a lower intensity (light weights/high reps) which means it can be performed over a long period of time (1)
- Little rest in between sets or exercises replicates cardiovascular / muscular endurance which is aerobic (1)
- Oxygen is available which allows energy to be produced to maintain muscular contractions (1)

Accept any other suitable discursive point around whether weight training is an aerobic or anaerobic activity.

**Maximum 3 marks**

0 5 . 7

Alex will be using a variety of fitness tests to monitor his level of performance.

Evaluate the use of the multi-stage fitness test as a valid measure of performance for a tennis player.

[4 marks]

**Marks for this question: AO3 = 4**

Award **one** mark for each of the following points up to a maximum of **four** marks.

**Agree**

- Cardiovascular endurance is a key component of fitness to enable Alex to compete for a minimum of two or more sets so test is relevant to Alex (1)
- 20M shuttles are repeated in the test which replicates the game (1)

**Disagree**

- The test is not sport specific and does not test the different intensities that are required in tennis e.g. 5 or 10 m sprints with periods of inactivity in between (1)
- The test does not test any of the skill based requirements of a tennis player (e.g. serving, ground strokes or equivalent example) (1)
- Can be argued that other components of fitness are more important e.g. agility to move around the court quickly (1)

Accept any suitable discursive point around the suitability of cardiovascular endurance for a tennis player.

**Maximum 4 marks**

0 6 . 1

Veins form part of the circulatory system.

State **two** structural features of veins.

[2 marks]

**Marks for this question: AO1 = 2**

Award **one** mark for each of the following points up to a maximum of **two** marks.

- Thin walls (1)
- Large lumen (1)
- Contain valves (1)

**Maximum 2 marks**

**0 6 . 2**

At rest the blood flow to the skeletal muscle is 20%. At rest the blood flow to the other organs is 80%.

Using the data in **Table 1**, calculate the blood flow to the other organs at maximal exercise.

**[1 mark]**

**Marks for this question: AO2 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

12% (1)

NB Accept 12 or twelve or twelve percent.

**Maximum 1 mark**

**0 6 . 3**

Using the data in **Table 1**, plot and label the lines on the graph paper for the following:

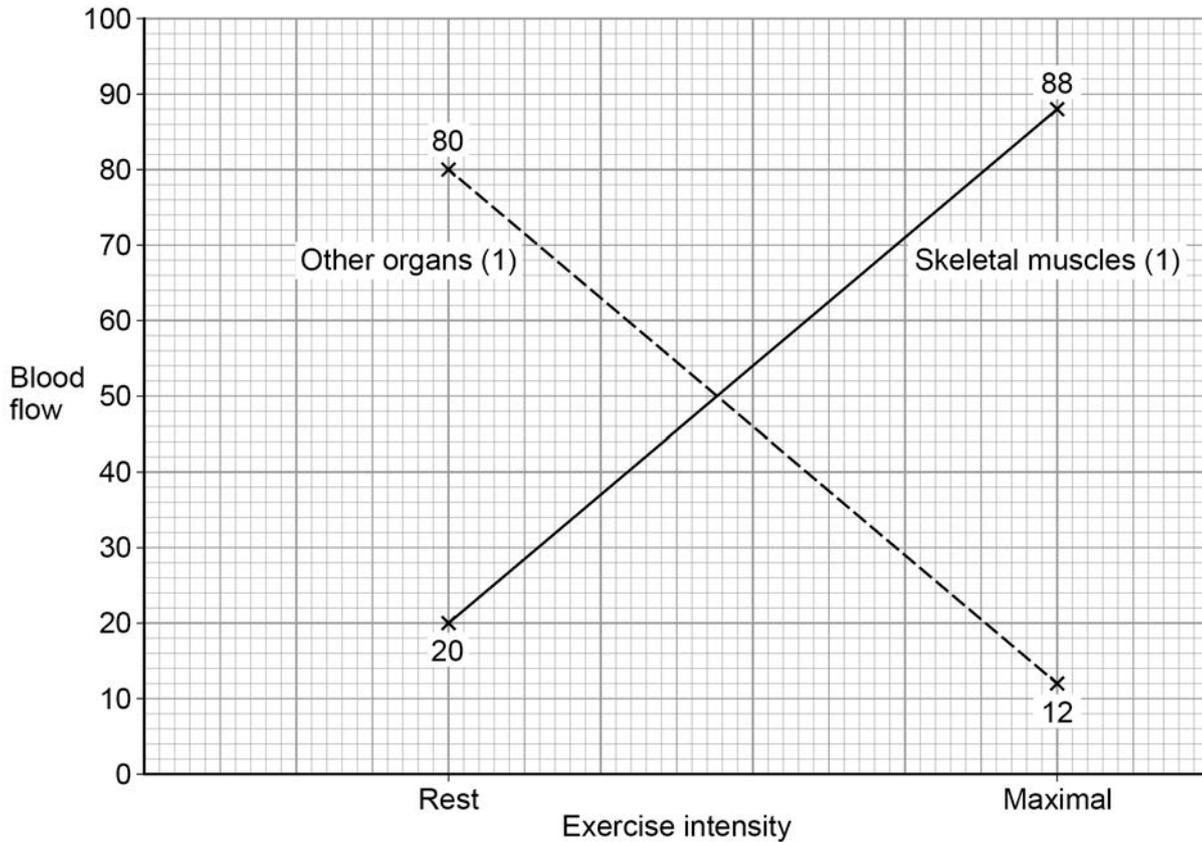
- the skeletal muscle at rest and maximal
- all other organs combined at rest and maximal

**[2 marks]**

**Marks for this question: AO2 = 2**

Award **one** mark for each of the following points up to a maximum of **two** marks.

- Skeletal muscle line correctly drawn and labelled (1)
- Other organs line correctly drawn and labelled (1)



**Maximum 2 marks**

**0 6 . 4** Explain why the distribution of blood during exercise is necessary. **[2 marks]**

**Marks for this question: AO1 = 2**

Award one mark for each of the following points up to a maximum of **two** marks.

- Active muscles require more nutrients and / oxygen (1)
- Less blood is distributed to other organs (1)

Accept any other suitable explanation of why the distribution of blood during exercise is necessary.

**Maximum 2 marks**

**0 7 . 1** Naveena regularly participates in hockey matches for her school and local club. She requires good coordination to compete successfully.

What is coordination?

**[1 mark]**

**Marks for this question: AO1 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- The ability to use different / two or more parts of the body together (smoothly and efficiently) (1)

Accept any other suitable definition of coordination.

**Maximum 1 mark**

**0 7 . 2** Why is it important for a hockey player to have good coordination?

**[1 mark]**

**Marks for this question: AO2 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- To hit a ball on the move (1)
- Use hands and eyes to save a shot from an opposition player (1)

Accept any other suitable reason why it is important for a hockey player to have good coordination.

**Maximum 1 mark**

07.3

Coordination, cardiovascular endurance, muscular endurance, power/explosive strength, reaction time, speed and strength are important components of fitness for a hockey player.

Name **one** other component of fitness. Outline why it is important for a hockey player.  
**[2 marks]**

**Marks for this question: AO1 = 1 AO2 = 1**

Award **one** mark for each of the following points up to a maximum of **two** marks. Award up to a maximum of **one** AO1 mark and up to a maximum of **one** AO2 mark.

- Flexibility (1 x AO1)
- Reach in the tackle / stretch to get the ball / equivalent (1 x AO2)
  
- Balance (1 x AO1)
- To stay stable when dribbling (around a player) / to not fall when dribbling / equivalent (1 x AO2)
  
- Agility (1 x AO1)
- To change direction quickly when tracking an opposition player / to go around an opponent when dribbling / equivalent (1 x AO2)

Accept any other examples of why a component of fitness is important to a hockey player. Example must relate to the named component of fitness.

Do not credit definitions of components of fitness. Do not credit coordination, cardiovascular endurance, muscular endurance, power/explosive strength, reaction time speed or strength.

**Maximum 2 marks**

07.4

Naveena experiences excess post-exercise oxygen consumption (EPOC) after sprinting throughout the game.

State what happens to Naveena's breathing immediately after she sprints.

[1 mark]

**Marks for this question: AO1 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- Continue to breathe deeply / quickly (1)
- Maintain high breathing rate (1)

Do not credit increased breathing rate.

**Maximum 1 mark**

07.5

State **three** benefits that Naveena will experience from cooling down immediately after the game.

[3 marks]

**Marks for this question: AO1 = 3**

Award **one** mark for each of the following points up to a maximum of **three** marks.

- Allows breathing rate or heart rate to return to its resting state slowly (1)
- Brings body temperature back down to its normal level (1)
- Removes lactic acid / CO<sub>2</sub> /waste products (1)
- To help repay the oxygen debt (1)
- Prevents(delayed onset of) muscle soreness or DOMS (1)
- Prevents blood pooling (1)

Accept any other suitable benefit that Naveena will experience from cooling down immediately after the game.

**Maximum 3 marks**

**0 8 . 1** Where does gaseous exchange take place?

**[1 mark]**

**Marks for this question: AO1 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- Lungs (1)
- Alveoli (1)
- Capillaries (1)
- Muscles (1)

**Maximum 1 mark**

**0 8 . 2** Explain the process of gaseous exchange.

**[4 marks]**

**Marks for this question: AO1 = 4**

Award **one** mark for each of the following points up to a maximum of **four** marks.

- Takes place through diffusion (1)
- Oxygen in alveoli moves into the blood capillaries (1)
- Oxygen concentration is lower in the capillaries compared to the alveoli (1)
- Carbon dioxide in the capillaries moves into the alveoli (1)
- Carbon dioxide concentration is lower in the alveoli than the capillaries (1)

Accept any other suitable explanation of the process of gaseous exchange.

**Maximum 4 marks**

09.1

Movement and protection are two functions of the skeleton.

Name **three** other functions.

**[3 marks]**

**Marks for this question: AO1 = 3**

Award **one** mark for each of the following points up to a maximum of **three** marks.

- Support (1)
- Structural shape (1)
- Points for attachment (1)
- Mineral storage (1)
- Blood cell production (1)

Accept any other suitable function of the skeleton. Do not accept movement or protection.

**Maximum 3 marks**

09.2

The shape and type of bones determine the amount of movement that is possible.

Explain the role of long bones during a game of badminton.

**[3 marks]**

**Marks for this question: AO2 = 3**

Award **one** mark for each of the following points up to a maximum of **three** marks.

- More pace can be generated with long levers (1)
- Allowing more force to be imparted on the shuttle (1)
- This allows the performer to hit the shuttle more effectively in a smash to win the point (1)

Accept any other suitable explanations of the role of long bones. Answers must relate to badminton.

**Maximum 3 marks**

1 0 . 1

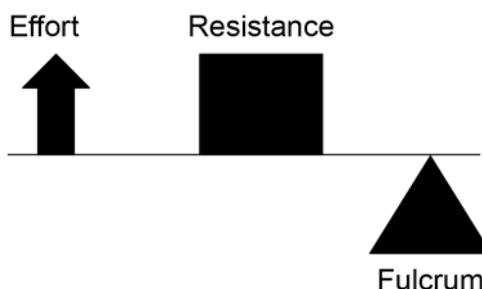
Greg Rutherford won a bronze medal in the long jump at the 2016 Olympic Games in Rio de Janeiro.

In the take-off phase of the long jump, Greg Rutherford uses a second class lever at the ankle.

Draw a linear diagram of a second class lever.

[1 mark]

Marks for this question: AO1 = 1



NB If diagram is not labelled, no marks can be awarded. Accept Load instead of Resistance. Arrows must be pointing the correct direction. Resistance must be above the line, fulcrum below the line, effort can be above or below the line. Accept E, R/L and F.

Maximum 1 mark

1 0 . 2

Explain why a second class lever system has a high mechanical advantage.

[2 marks]

Marks for this question: AO1 = 2

Award **one** mark for each of the following points up to a maximum of two marks.

**Sub max 1 mark**

- Effort arm is longer than resistance arm (1)
- It has a short resistance arm (load) (1)
- $MA = \text{Effort arm} \div \text{Resistance arm or load}$  (1)

**Sub max 1 mark**

- 2<sup>nd</sup> class levers allow a heavy load to be lifted more efficiently (1)
- Second class levers always have a mechanical advantage of greater than one (1)

Accept any other suitable explanation of why a second class lever system has a high mechanical advantage.

Maximum 2 marks

1	0	.	3	Identify <b>two</b> types of movement that occur at the ankle.	<b>[2 marks]</b>
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**Marks for this question: AO1 = 2**

Award **one** mark for each of the following points up to a maximum of two marks.

- Plantarflexion (1)
- Dorsiflexion (1)

**Maximum 2 marks**

1	0	.	4	Evaluate the importance of speed <b>and</b> muscular endurance for an elite long jumper.	<b>[6 marks]</b>
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**Marks for this question: AO1 = 1 AO2 = 2 AO3 =3**

Level	Marks	Description
3	5-6	Knowledge of speed and muscular endurance is accurate and generally well detailed. Application to an elite long jumper is mostly appropriate, clear and effective. Evaluation is thorough, reaching valid and well-reasoned conclusions for both components of fitness. The answer is generally clear, coherent and focused, with appropriate use of terminology throughout.
2	3-4	Knowledge is evident for both speed and muscular endurance but is more detailed for one than the other. There is some appropriate and effective application to elite long jumpers, although not always presented with clarity. Any evaluation is clear but reaches valid and well-reasoned conclusions for one component of fitness more than the other. The answer lacks coherence in places, although terminology is used appropriately on occasions.
1	1-2	Knowledge of speed and muscular endurance is limited. Application to elite long jumpers is either absent or inappropriate. Evaluation is poorly focused or absent, with few or no reasoned conclusions for either component of fitness. The answer as a whole lacks clarity and has inaccuracies. Terminology is either absent or inappropriately used.
0	0	No relevant content.

**Possible content may include:**

**AO1 – Knowledge of speed and muscular endurance eg**

- Speed – the maximum rate at which an individual is able to perform a movement or cover a distance in a period of time, putting the body parts into action as quickly as possible
- Muscular endurance – ability of a muscle or muscle group to undergo repeated contractions, avoiding fatigue

**AO2 – Application to the long jump e.g.**

- Long jump does not need muscular endurance because it is a short, explosive, anaerobic event
- Long jump requires speed as the faster the athlete can run down the runway the more distance they can achieve assuming they jump high.  $\text{Speed} \times \text{height} = \text{distance}$

**AO3 – Analysis / evaluation of the importance of speed and muscular endurance in the long jump, e.g.**

- Muscular endurance is not necessary for a long jump but when they are competing in a major championships they may have to jump 6 times, hence undergoing repeated contractions in a short time span
- The long jump may take place over two days therefore the athlete will have to undergo very explosive muscular contractions with little time for recovery
- Speed is one of the major components of fitness required by a long jumper
- Speed is vital if the long jumper is going to attain a long distance
- The run up is relatively short therefore a long jumper needs to attain maximum speed in a short time
- Take off speed is more important than 100M speed
- It is possible to win a long jump competition without speed, but not at a major championship competition
- The long jump requires a high degree of skill, so speed is not the only requirement
- The jumping action (skill) is as important as speed

1	0	. 5	<p>Greg will need to apply the principles of training to his performance programme to enable him to be a more effective long jumper.</p> <p>How can Greg use specificity and progressive overload to improve his level of performance in the long jump?</p> <p style="text-align: right;"><b>[2 marks]</b></p>
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**Marks for this question: AO2 = 2**

Award **one** mark for each of the following up to a maximum of two marks.

**Specificity**

- He should focus on leg work to build up muscles for jumping (1)
- Activities should replicate the actions and movements of the long jump (1)

**Progressive overload**

- He should increase the intensity of his training so he can become more powerful on take-off (1)
- He can train more often to improve his long jump technique (1)
- He can train for longer so he can work on different components of the long jump (1)
- His training must progress in order that he can make gradual improvements to the length of his jump (1)

Accept any other suitable explanation of how specificity and / or progressive overload could be used to improve performance. Answers should be directly applied to the long jump.

**Maximum 2 marks**

1	1	<p>A sportsperson may be fit, but not healthy.</p> <p>Use examples to explain this statement.</p> <p style="text-align: right;"><b>[2 marks]</b></p>
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**Marks for this question: AO2 =2**

Award **one** mark for each of the following points up to a maximum of **two** marks.

**Fit (sub max 1 mark)**

- A person may be fit because they can run a half marathon (1)
- A person can be fit to play 90 minutes of football (1)
- A person may be fit because they regularly swim (1)

**Not Healthy (sub max 1 mark)**

- They may not be healthy because they have high blood pressure / equiv. physical health problem (1)
- They may not be healthy as they suffer from depression / equiv. mental health problem (1)
- They may not be healthy because they take drugs / have an alcohol problem / smoke / equivalent (1)

Accept any other suitable explanation of how a person may be fit but not healthy.

Answers must contain examples to be credited.

**Maximum 2 marks**

1 2 . 1

Zoe is a 16-year-old girl who plays football.

Which **one** of these is Zoe's maximum heart rate?

[1 mark]

**Marks for this question: AO2 = 1**

**C – 204**

**Maximum 1 mark**

1 2 . 2

Explain **three** ways in which an increase in explosive strength may improve Zoe's performance in football.

[3 marks]

**Marks for this question: AO2 = 3**

Award **one** mark for each of the following points up to a maximum of **three** marks.

- Enable her to sprint faster to beat a defender to set up a goal scoring opportunity / equivalent (1)
- Enable her to jump higher to win a header / equivalent (1)
- Enable her to kick the ball harder so less chance of an interception / equivalent (1)

Accept any other suitable explanation of how an increase in explosive strength may improve Zoe's performance in football.

**Maximum 3 marks**

1 2 . 3

What is Fartlek training?

[1 mark]

**Marks for this question: AO1 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- Training using different intensities or over different terrains e.g. sprint, jog, walk, sprint, etc. (1)

Do not accept 'speedplay' on its own

**Maximum 1 mark**

1	2	.	4	Discuss whether Fartlek training is an effective method of training for Zoe.
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**[4 marks]****Marks for this question: AO3 = 4**Award **one** mark for each of the following points up to a maximum of **four** marks.**AO3****For (sub-max 3 marks)**

- Fartlek training can replicate the game situation, e.g. when Zoe is sprinting for the ball, closing down a player or when jogging back into position after a free kick is conceded (1)
- Fartlek training uses different intensities to train both Zoe's aerobic and anaerobic energy systems (1)
- Fartlek training can be used to train a range of fitness components related to football e.g. speed when sprinting in a fast counter attack or cardiovascular endurance to play to her potential for the duration of the game (1)
- Fartlek training allows Zoe to train as a group or team or on her own (1)
- Fartlek training requires no specialist equipment, therefore is inexpensive and accessible to Zoe and others (1)
- Fartlek training can easily be incorporated into a football training session e.g. sprint, walk, half pace etc. (1)
- Fartlek training can take place outdoors, on a football pitch or inside a sports hall (1)

**Against (sub-max 3 marks)**

- Fartlek training does not replicate 'real time' match situations as no opposition are present during training (1)
- Fartlek training does not replicate the ground conditions as Zoe will be playing on a 'flat' grass or artificial pitch (1)
- Fartlek training is not totally sports specific as football is played with a ball and not based completely around fitness (1)
- Fartlek training is usually performed at high intensities during the session therefore Zoe may be prone to an increase of injury (1)

NB Do not credit responses relating to other methods of training.

Accept any other suitable discursive point over whether Fartlek training is an effective method of training for Zoe.

**Maximum 4 marks**

1	2	.	5
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 Outline **one** way that Zoe's skeleton protects her vital organs during a game of football.

[1 mark]

**Marks for this question: AO2 = 1**

Award **one** mark for each of the following points up to a maximum of **one** mark.

- Her cranium / skull protects her brain when heading the ball (1)
- Her ribs protect her heart / lungs if the ball hits her when she's standing in a wall (1)

Accept any other suitable outline of how Zoe's skeleton protects her vital organs. Answers must relate to a game of football.

**Maximum 1 mark**

<b>1</b>	<b>3</b>	<p>Gary is a 44-year-old man who has recently decided to stop competing in basketball. He has suffered a number of injuries due to the intensive nature of the game. Gary has decided to take up road cycling in order to stay active. He plans to take part in competitions and has started a programme of continuous training to help him improve his performance in road cycling.</p> <p>Evaluate the appropriateness of continuous training for Gary.</p>	<b>[9 marks]</b>
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**Marks for this question: AO1 = 2, AO2 = 2, AO3 = 5**

Level	Marks	Description
3	7-9	Knowledge of continuous training is accurate and generally well detailed. Application to Gary is mostly appropriate, clear and effective. Evaluation is thorough, reaching valid and well-reasoned conclusions for the appropriateness of the training method. The answer is generally clear, coherent and focused, with appropriate use of terminology throughout.
2	4-6	Knowledge of continuous training is evident but is more detailed for some factors more than others. There is some appropriate and effective application to Gary, although not always presented with clarity. Any evaluation is clear but reaches valid and well-reasoned conclusions for some points on appropriateness more than others. The answer lacks coherence in places, although terminology is used appropriately on occasions.
1	1-3	Knowledge of continuous training is limited. Application to Gary is either absent or inappropriate. Evaluation is poorly focused or absent with few or no reasoned conclusions. The answer as a whole lacks clarity and has inaccuracies. Terminology is either absent or inappropriately used.
0	0	No relevant content.

**Possible content may include:**

**AO1 – Knowledge of continuous training e.g.**

- Involves exercising for a sustained period of time without rest
- Improves cardiovascular fitness
- Involves working at a constant rate or intensity / often referred to as steady state exercise

**AO2 – Application to Gary e.g.**

- Continuous training is appropriate for Gary / a road cyclist as it is an activity that can be sustained without rest and repeated over and over
- It will improve Gary's cardiovascular fitness so he will be able to keep going for longer in cycling
- Repetitive nature of continuous training / cycling not as intensive as basketball so could reduce risk of injuries for Gary

**AO3 – Evaluation of the appropriateness of continuous training for Gary e.g.**

- Body shape may change / become an ectomorph resulting in Gary being more streamlined and therefore more efficient resulting in a faster speed
- More muscular strength to assist in sprinting and hill climbing to enable Gary to sprint faster or maintain his pace when climbing a hill
- Improved muscular endurance to enable Gary to sustain his maximum effort over a long period of time
- Could still result in injury due to repetitive contractions / continuous nature of training

- However, less likely to have injury to meniscus or cruciate ligaments in the knees or equivalent as not being put under the same pressure as they would from jumping in basketball
- Although continuous training is the most appropriate method of training, there are other methods that can be used e.g. interval could be important to overcome hills and short sprints etc.
- Fartlek training would be applicable for sprinting and hill climbing and different changes in intensity during the race
- Plyometric training would be applicable to generate power for hill climbing
- Weight training would be useful, mainly muscular endurance training so repeated muscular contractions can be made over an extended period of time, particularly if riding long distances, up a gradient or against a head wind
- Gary could supplement continuous training with manipulation of diet e.g. take on carbohydrates for energy to keep going on a ride / protein for muscle repair to be able to keep training
- Gary could have ice baths / massages to prevent DOMS / recover from vigorous exercise to be able to train again quicker
- Gary could use SPORT and FITT to inform safe and effective training

Accept any other suitable evaluation for the appropriateness of continuous training for Gary.

**Maximum 9 marks**

<b>Question</b>	<b>AO1</b>	<b>AO2</b>	<b>AO3</b>
<b>01</b>	1		
<b>02</b>		1	
<b>03</b>	1		
<b>04</b>		1	
<b>05.1</b>	2		
<b>05.2</b>	2		
<b>05.3</b>		1	
<b>05.4</b>		1	
<b>05.5</b>		1	
<b>05.6</b>			3
<b>05.7</b>			4
<b>06.1</b>	2		
<b>06.2</b>		1	
<b>06.3</b>		2	
<b>06.4</b>	2		
<b>07.1</b>	1		
<b>07.2</b>		1	
<b>07.3</b>	1	1	
<b>07.4</b>	1		
<b>07.5</b>	3		
<b>08.1</b>	1		
<b>08.2</b>	4		
<b>09.1</b>	3		
<b>09.2</b>		3	
<b>10.1</b>	1		
<b>10.2</b>	2		
<b>10.3</b>	2		
<b>10.4</b>	1	2	3
<b>10.5</b>		2	
<b>11</b>		2	
<b>12.1</b>		1	
<b>12.2</b>		3	
<b>12.3</b>	1		

<b>12.4</b>			<b>4</b>
<b>12.5</b>		<b>1</b>	
<b>13</b>	<b>2</b>	<b>2</b>	<b>5</b>
<b>Total</b>	<b>33</b>	<b>26</b>	<b>19</b>