The EverLearner

# Mark Scheme

# Edexcel GCSE PE – Paper 1

**This mark scheme contains:**

- Copy of each question for reference
- Marking guidance where appropriate
- Marking points containing alternative acceptable responses plus relevant assessment objective

**How should schools use this mark scheme?**

The mark scheme has been constructed specifically for the exam paper used in preparation for and during the live revision shows provided by James Simms in May 2022.

All questions/mark schemes are taken from ExamSimulator. Please note, there are hundreds of additional questions on ExamSimulator covering the AEI topics. Within the platform, the teacher is assisted with the marking and full diagnostic feedback is also provided. ExamSimulator is a premium resource available via TheEverLearner.com.

I hope this helps both students and teachers in their exam preparations.

*James Simms*

1. The atlas and axis joint in the neck is used when taking a breath in swimming.
Identify the **type** of joint and the **range of movement** possible at the neck.

## Marking guidance

Allow phonetic spellings of "pivot".
Do not accept "turning" for the range of movement.

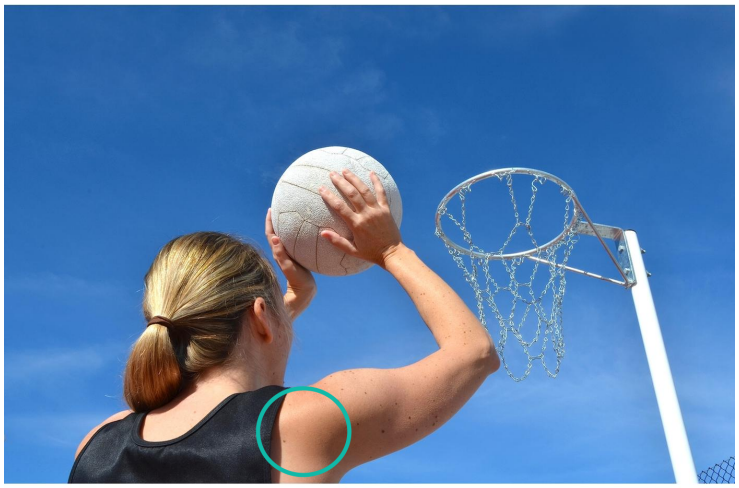
## Marking points

(1) [AO 1] The atlas and axis is a pivot joint/Pivot joint/Pivot

(2) [AO 1] Allows rotation/Rotation/Rotational movement

(3) [AO 1] Flexion and extension/Flexion to extension/Flexion then extension

2. The shoulder joint is used during shooting in netball.
Identify the **type** of joint and **two** possible ranges of movement at the shoulder.



## Marking guidance

Submax two marks for movement patterns. The third (probably the first) mark must come from identifying the type of joint.
Allow phonetic spellings of "ball and socket".
Do not accept "opening" or "closing" for the range of movement.
Students need to name **two** movements to access the second and third mark. For example "the shoulder joint allows flexion and extension" would only be awarded one mark.
"The shoulder joint allows flexion and extension, as well as rotation" can be awarded both marks.

## Marking points

(1) [AO 1] The shoulder is a ball and socket joint/Ball and socket joint/Ball and socket

(2) [AO 1] Allows flexion and extension/Flexion and extension/Flexion to extension

(3) [AO 1] Allows abduction and adduction/Abduction to adduction/Abduction then adduction

(4) [AO 1] Allows rotation/Rotational movement/Rotation

(5) [AO 1] Allows circumduction/Circumduction/Circumducting

3. Describe the role of tendons during movement.

## Marking guidance

For marking point 1, accept reference to **either** muscle insertion or origin.
Do not accept "bone to bone" (ligament).

## Marking points

(1) [AO 1] Connects muscle to bone/Joins muscle to bone/Attachment of muscle to bone

(2) [AO 2] Force applied to the bone via the tendon/Bone being pulled/Bone having force applied

(3) [AO 2] Makes bones move when muscles contract/Cause movement to occur/Movement of bones via muscular contraction

4. Describe the role of ligaments during movement.

## Marking guidance

Do not accept "muscle to bone" (tendon).

## Marking points

(1) [AO 1] Connects bone to bone/Joins bone to bone/Attachment of bone to bone

(2) [AO 2] Helps to stabilise the joint/To stabilise the joint/Stabilises the joint

(3) [AO 2] Help to prevent dislocation/To prevent dislocation/Prevent dislocation

5. The table shows muscle classification and characteristics.
Identify A, B, C and D.

| Image | Muscle classification | Characteristic (voluntary / involuntary) |
|---|---|---|
|  | A | Voluntary |
|  | B | Involuntary |
|  | C | D |

## Marking guidance

Accept phonetic spelling of muscle classifications. For students to be awarded marks for muscle classification, they **must** match the relevant letter. For example "B is a cardiac muscle" is not acceptable.

## Marking points

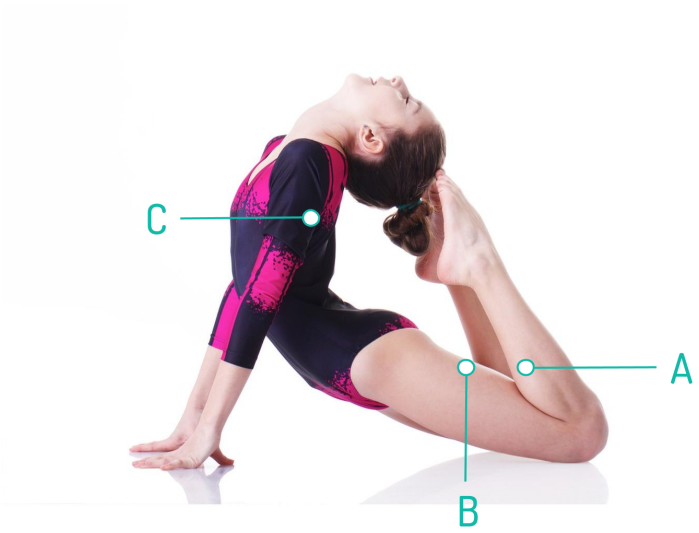
(1) [AO 1] A is skeletal muscle/A skeletal muscle/Skeletal muscle

(2) [AO 1] B is smooth muscle/B smooth muscle/Smooth muscle

(3) [AO 1] C is cardiac muscle/C cardiac muscle/Cardiac muscle

(4) [AO 1] D is involuntary/D is involuntary/Involuntary

6. Name the muscle labelled **A** and identify the role it is playing in this movement.




## Marking guidance

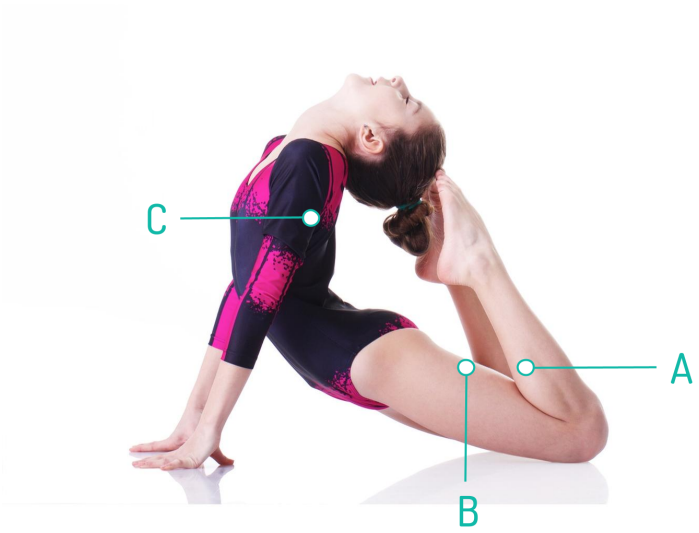
Accept phonetic spellings of gastrocnemius and plantar flexion.
Accept soleus instead of gastrocnemius. Soleus is not required at this level but a student could legitimately answer the question with soleus.
Do not accept "calf muscle" as correct.

## Marking points

(1) [AO 1] A is the gastrocnemius/The gastrocnemius/Gastrocnemius

(2) [AO 2] Plantar flexion at the ankle/Plantarflexion at the ankle/Plantar flexion

7. Name the muscle labelled **C** and identify the role it is playing in this movement.




## Marking guidance

Accept reference to "triceps brachii". Whilst this knowledge is not required at this level, it should be credited if given.
Accept phonetic spelling of "triceps".

## Marking points

(1) [AO 1] C is the triceps/The triceps/Triceps

(2) [AO 2] Extension at the elbow/Elbow extension/Extension

8. During the summer season, Gurjosh represents his athletics club in the 3000m. Gurjosh relies on his cardiovascular system to remove carbon dioxide.
Evaluate the importance of other functions of the cardiovascular system to improve his performance.

## Marking guidance

9 Mark Level Descriptors

AO1 is knowledge and understanding of the cardiovascular system. AO2 i applying that knowledge to Gurjosh's performance in the 3000m. AO3 is making reasoned judgements about the importance of those functions of the CV system.
Reward all acceptable answers and responses are not limited to the marking points.

## Marking points

(1) [AO 1] Transport of oxygen/Red blood cells transport oxygen

(2) [AO 1] Oxygen delivery to working muscles to release energy/Oxygen delivery to tissues to release energy

(3) [AO 1] Clotting of open wounds/Platelets clot blood/Platelets help form a scab

(4) [AO 1] Regulation of body temperature/Help to keep the body cool/Sweating to cool the body

(5) [AO 2] Gurjosh can respire aerobically to maintain his race pace/Gurjosh can respire aerobically to run for longer/Gurjosh can respire aerobically to delay fatigue

(6) [AO 2] Gurjosh can continue the race if he were to cut his leg or sustain a nose bleed/Gurjosh can continue to train if he were to cut his leg or sustain a nose bleed

(7) [AO 2] Gurjosh does not overheat and can continue the race/Gurjosh does not overheat and can continue to release energy efficiently

| | |
|---|---|
| 8. | During the summer season, Gurjosh represents his athletics club in the 3000m. Gurjosh relies on his cardiovascular system to remove carbon dioxide.<br>Evaluate the importance of other functions of the cardiovascular system to improve his performance. |

(8) [AO 3] Transport of oxygen is essential as the event is aerobic and energy will be released slowly/Transport of oxygen is essential as he would have to stop or slow down

(9) [AO 3] Transport of oxygen is not essential during a sprint as it is predominantly anaerobic/Transport of oxygen is not essential during a sprint as oxygen is not utilised/Anaerobic respiration only represents a small part of the race

(10) [AO 3] Clotting is not that relevant as there is no contact with other athletes/Clotting is not that relevant as he is unlikely to fall or trip

(11) [AO 3] Regulation of body temperature is important as the event is in a warm climate/Regulation of body is important as he may become dizzy or nauseous and have to stop

(12) [AO 3] All functions have a role; however, transport of oxygen and regulation of body temperature are the most important/All functions have a role; however, transport of oxygen and regulation of body temperature will allow Gurjosh to sustain race pace for longer

9. Both the aerobic and anaerobic equations of respiration are shown in the table.
**Justify** why equation **A** shows aerobic energy release.

| System | Energy release |
|---|---|
| Aerobic respiration | Glucose + Oxygen → Carbon dioxide + Water + Energy |
| Anaerobic respiration | Glucose → Lactic acid + Energy |

## Marking guidance

Sub max of one mark for reference to "includes oxygen" or equivalent statements. Sub max of one mark for reference to "the by-product is carbon dioxide and/or water" or equivalent. For example, "this equation is aerobic because it includes oxygen and one of the by-products is carbon dioxide" is worthy of two marks.

## Marking points

(1) [AO 2] A makes reference to oxygen being used/A includes oxygen being used/A refers to oxygen being used

(2) [AO 2] Oxygen is required in aerobic respiration/Oxygen aerobic respiration/Oxygen aerobic

(3) [AO 2] B does not make reference to oxygen/B doesn't include oxygen being used/B does not refer to oxygen being used

(4) [AO 2] Oxygen is not required in anaerobic respiration/Oxygen not used in anaerobic respiration/Oxygen not anaerobic

(5) [AO 2] By-product of aerobic respiration is carbon dioxide and water/By-product of aerobic respiration is carbon dioxide /By-product of aerobic respiration is water

(6) [AO 2] By-product of anaerobic respiration is lactic acid/By-product of anaerobic respiration is lactic acid /By-product of anaerobic respiration is lactic acid

(7) [AO 2] Lactic acid is not produced in aerobic respiration/Lactic acid not a by-product of aerobic respiration/Lactic acid not a byproduct of aerobic respiration

10. The table shows three of the body systems.
State **one** short-term effect of exercise on each of these and explain how these would benefit a **rugby player** whilst competing.

| | Short-term effect of exercise |
|---|---|
| Cardiovascular system | |
| Muscular system | |
| Respiratory system | |

## Marking guidance

Sub max of one mark for each body system and a sub max of three marks for the short-term effects. Sub max of three marks as well for the importance to the rugby player. For example, "heart rate and stroke volume would increase, as well as cardiac output. Furthermore, there would be an increased level of muscular fatigue and lactate accumulation. This would mean that the rugby player would be able to deliver more oxygen to the body" would only achieve four marks, as five points are given for short-term effects (sub max of three) but only one effect on the performer.

## Marking points

(1) [AO 1] Increased heart rate/Heart rate goes up/Elevated heart rate

(2) [AO 1] Increased stroke volume/Stroke volume goes up/Elevated stroke volume

(3) [AO 1] Increased blood flow/Blood flow goes up/More blood flow

(4) [AO 1] The redistribution of blood flow/The redistribution of blood/Redistribution of blood

(5) [AO 1] Increased blood pressure/Blood pressure goes up/More blood pressure

(6) [AO 1] Increased muscle temperature/Muscle temperature goes up/More muscle temperature

(7) [AO 1] The performer will suffer from muscle fatigue/The performer will suffer from muscular fatigue/Suffer from muscle fatigue

(8) [AO 1] Increased levels of lactate/Lactate accumulation/Build-up of lactate

| | |
|---|---|
| 10. | The table shows three of the body systems.<br>State **one** short-term effect of exercise on each of these and explain how these would benefit a **rugby player** whilst competing. |

(9) [AO 1] Increased carbon dioxide/Carbon dioxide goes up/Elevated carbon dioxide

(10) [AO 1] The performer will experience oxygen deficit/Experience oxygen deficit/Oxygen deficit will occur

(11) [AO 1] Increased depth of breathing/Depth of breathing goes up/Elevated depth of breathing

(12) [AO 1] Increased rate of breathing/Rate of breathing goes up/Elevated rate of breathing

(13) [AO 1] Increased tidal volume/Tidal volume goes up/Elevated tidal volume

(14) [AO 1] Increased minute ventilation/Increase in minute ventilation/Minute ventilation goes up

(15) [AO 2] Increases oxygen delivery/More oxygen transported around the body/More oxygen carried around the body

(16) [AO 2] Increases nutrient delivery/More nutrients transported around the body/More nutrients carried around the body

(17) [AO 2] Increases gas exchange at the muscles/Increase gaseous exchange at the muscles/Gas exchange goes up at the muscles

(18) [AO 2] Increased muscle elasticity/Muscle elasticity goes up/Muscle elasticity

(19) [AO 2] Increased range of movement at the joint/Range of movement at the joint goes up/Increased range of movement

(20) [AO 2] Less prone to muscle tear/Less likely to tear a muscle/Muscle tears are less likely

(21) [AO 2] Less prone to muscle pulls/Less likely to pull a muscle/Muscle pulls are less likely

(22) [AO 2] Reduces the muscles' ability to perform/Less ability for the muscles to perform/Reduced muscle performance

(23) [AO 2] Increased oxygen intake to the lungs/Increased oxygen intake/Increased oxygen to the lungs

(24) [AO 2] Increased gas exchange to the lungs/Gas exhange happens quicker/Gas exchange is more efficient

(25) [AO 2] Quicker removal of carbon dioxide/Better removal of carbon dioxide/Removal carbon dioxide

11. Weight training for a rugby player will help to cause long-term adaptations in the musculoskeletal system.
State **two** musculoskeletal adaptations that a rugby player would experience after regular training.

## Marking guidance

One mark should be awarded for each correct training adaption.

## Marking points

(1) [AO 1] Increased bone density/Bone density increases/Bone density

(2) [AO 1] Increased strength of tendons and ligaments/Tendons and ligaments become stronger/Tendons and ligaments can withstand more force

(3) [AO 1] Muscular hypertrophy occurs/Increased muscular hypertrophy/Muscles get bigger

12. As well as a stronger diaphragm, regular endurance training will cause other adaptions to the respiratory system.
State **two other** long-term adaptations.

## Marking guidance

One mark should be awarded for each correct training adaption. Do **not** accept "increased tidal volume" as a response.

## Marking points

(1) [AO 1] Increased number of alveoli in the lungs/Increased density of alveoli in the lungs/Number of alveoli in lungs goes up

(2) [AO 1] Increased lung capacity/Lung capacity/Capacity

(3) [AO 1] Increased vital capacity/Vital capacity

(4) [AO 1] Increased strength of the external intercostal muscles/Strength of the external intercostal muscles increases/Strength of the external intercostal muscles

13. State the definitions A and B, missing from the table.

| Key term | Definition |
|---|---|
| Health | A state of complete emotional, physical and social well-being, and not merely the absence of disease and infirmity. |
| Fitness | A |
| Exercise | B |

## Marking guidance

Sub max of one mark for each definition. In order to access the mark for A, a reference to "meeting the demands of the environment" or equivalent is reqiured. In order to access the mark for B, a reference to a form of physical activity to improve health and/or fitness needs to be present.

## Marking points

(1) [AO 1] The ability to meet the demands of the environment/Meet the demands of the environment/Demands of the environment

(2) [AO 1] A form of physical activity done to maintain or improve health and or fitness. It is not competitive sport/A form of physical activity done to maintain or improve health and or fitness/A form of physical activity done to maintain or improve health

14. The **sit-and-reach test** is used to measure flexibility.
Identify **three** ways in which a participant could invalidate sit-and-reach test results.

Sit and Reach Test

## Marking guidance

Not provided

## Marking points

(1) [AO 2] Wearing trainers/Wearing shoes/Not bare feet

(2) [AO 2] Not knees flat on floor/Not straight legs/Knees bent

(3) [AO 2] Soles of feet not flat on the box/Feet not flat against the box

(4) [AO 2] Reach forward with one hand/Stretch forward with one hand/Hands not on top of the other

(5) [AO 2] Stretch does not last for two seconds/Not held for two seconds/Stretch does not last for 2s

(6) [AO 2] Jerking movements/Bouncing/Ballistic

15. Describe the Cooper 12 minute run test for cardiovascular endurance.

## Marking guidance

Sub max of two marks for the procedure and sub max of one mark for the recording of the result.

## Marking points

(1) [AO 1] Run for 12 minutes around a designated course/Run for 12 minutes around a marked course/Run for 12 minutes on a course

(2) [AO 1] Place cones 50m apart/Cones 50m apart/Cones placed to mark the course

(3) [AO 1] Measure the distance you cover and calculate your VO2 max/Measure the distance covered/Measure your VO2 max using the distance covered

(4) [AO 1] Compare results against normative data/Compare results/Use normative data

16. The table shows fitness tests that were completed by a year-11 male student.
**Analyse** the results that were collected.

16. The table shows fitness tests that were completed by a year-11 male student.
**Analyse** the results that were collected.

| Fitness test | Score | Class average (males) |
|---|---|---|
| Cooper 12-minute run | 1950 metres | 2200 metres |
| One-minute press-up test | 22 press-ups | 32 press-ups |
| Sit-and-reach test | 11cm | 7cm |
| 30m sprint test | 4.60 seconds | 4.30 seconds |
| Hand-grip strength test | 41kg | 48kg |

## Marking guidance

No marks are available for simply repeating the data that is already represented. For example, "the student ran 1950 metres in the Cooper run" is not acceptable; however, "the student was 250 metres below the class average" is worth a mark.

## Marking points

(1) [AO 3] Cooper run score is below the class average/Cooper run score is 250 metres below the class average/Cooper run score is 250m below average

(2) [AO 3] One-minute press-up score is below the class average/One-minute press-up score is below average/One-minute press-up score is 10 below class average

(3) [AO 3] Sit-and-reach test is 4cm above class average/Sit-and-reach score is above class average/4cm above average

(4) [AO 3] 30m sprint is 0.3 seconds slower than the class average/0.3 seconds slower than the class average/0.3 seconds slower than average

(5) [AO 3] Hand-grip strength score is 7kg below class average/Hand-grip strength score is 7kg below average/7kg below class average

(6) [AO 3] Four out of the five scores are worse than class average/4 out of 5 scores are worse than class average/4 scores are below average

(7) [AO 3] Sit and reach score is the only one above average/Only one score above class average/One score above average

16. The table shows fitness tests that were completed by a year-11 male student.
**Analyse** the results that were collected.

17. Compare continuous and fartlek training by providing **three** differences between them.

## Marking guidance

To be awarded all three marks, three **separate comparisons need to be made.**

## Marking points

(1) [AO 3] Continuous is steady state/Fartlek is not steady state/Continuous is one paced

(2) [AO 3] Continuous is done on consistent terrain/Fartlek is on varying terrain/Fartlek is done on different surfaces

(3) [AO 3] Continuous tends to be on the flat/Fartlek includes inclines and declines/Fartlek includes hills

(4) [AO 3] Continous is more aerobic in nature/Fartlek is more anaerobic in nature/Continuous uses less of the anaerobic system

18. The table shows one week of **training** from a first-team player at Wiggleton-by-sea FC. Justify the use of this **training method** for the player.

| Day of the week | Activity | Length of session |
|---|---|---|
| Monday | Cycle online at 60% maximum heart rate | 60 minutes |
| Tuesday | Rest | |
| Wednesday | Club cycle 25km with no breaks | 90 minutes |
| Thursday | Rest | |
| Friday | Cycle with a friend at 65% maximum heart rate | 2 hours |
| Saturday | Rest | |
| Sunday | Local club race | |

## Marking guidance

In order to access all three marks, they must give three separate justifications of why interval training is suitable.

## Marking points

(1) [AO 3] The type of training is interval training/Interval training/Interval

(2) [AO 3] It can develop anaerobic fitness which is needed for football/Develops anaerobic fitness needed for football/Anaerobic fitness needed for football

(3) [AO 3] Includes a rest period to allow recovery which is similar to a football match/Rest periods allow recovery like a football match/Rest periods allow recovery

(4) [AO 3] Training does not take as long so avoids tedium/Training is more interesting/Training avoids tedium

(5) [AO 3] Elevates heart rate to near maximum which develops cardiovascular fitness/Elevates heart to near maximum/Elevates heart rate a lot so it develops cardiovascular fitness

19. Describe the effect stimulants have upon the body and give an example of a performer who may benefit.

## Marking guidance

Sub max of one mark for the description of the effect and sub max of one mark for a relevant sporting example. For example "stimulants increase alertness by stimulating the central nervous system" has given two descriptive elements but no sporting example, so it is only one mark.
Accept suitable sporting examples that require alertness or delayed fatigue.

## Marking points

(1) [AO 1] Increases alertness/Alertness

(2) [AO 1] Increases reaction time/Reaction time

(3) [AO 1] Stimulates the central nervous system/Central nervous system

(4) [AO 2] Cricketer/Cricket/Tennis player

20. The table shows information about a performance-enhancing drug.
Complete the table looking at the use of these in sport.

| Performance-enhancing drug (PED) | Positive effect of the PED | Negative effect of the PED | Sport where taking the PED would be advantageous |
|---|---|---|---|
| A | B | Tiredness and nausea | Archer |

## Marking guidance

The correct description must link to the correct letter. For example "A is decreasing heart rate" is not correct.

## Marking points

(1) [AO 1] A is beta blockers/Beta blockers

(2) [AO 1] B reduces heart rate/Reduces heart rate/Heart rate