



The EverLearner

National Mock Exams 2023

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Mark Scheme

OCR A-Level PE - Paper 1

Please read before distributing to students.

Purpose of this document

This document and the associated question paper are based on the data analysis performed by The EverLearner Ltd and published within the 2023 infographics. We are confident that:

- We believe this mark scheme has a very strong association with the actual external exam in 2023 in relation to command terms, skills, AO distribution, extended writing requirements and topics.
- However, this is categorically NOT a mark scheme for a predicted paper. No-one can accurately predict an exam paper and we make no claim to this end.
- It is vital that you only use this document internally in your school/college. Publishing the document online or sharing it in any other way is strictly prohibited as this will undermine the potentially educational experiences of students in other schools/colleges.
- Finally, please check the publication dates of the model answers for this paper as well as the associated revision sessions in May and June.

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 The EverLearner's National Mock Exams from 2023. The model answers will be available on the 28th April and some of these questions will be discussed in the live revision show provided by James Simms (Wednesday 10th May, 15:30-17:00 on [youtube.com/TheEverLearner](https://www.youtube.com/TheEverLearner)).

All questions/mark schemes are available on ExamSimulator. Please note, there are hundreds of additional questions and mark schemes on ExamSimulator covering the OCR A-Level PE topics and skills. 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



Subject	Physical Education
Course	OCR Linear GCE PE
Time allowed	2 hours

Title	OCR A-level (H555) Paper 1 National Mock Exam 2023
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Guidance	<ul style="list-style-type: none">• This paper is marked out of 90 marks.• You have 120 minutes (plus additional time for those who have Exam Access Arrangements).• Answer all questions.• A calculator is permitted for this exam.• This paper contains one 20-mark question.• Good luck.
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Total marks	90
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1. Describe the all-or-none law of muscle contraction.

Marking points (maximum 2)

- (1) [AO 1] If the threshold is reached, the entire motor unit contracts
- (2) [AO 1] Motor units with a higher threshold will not contract
- (3) [AO 1] When all the fibres within a motor unit contract completely or not at all

2. Identify **two** causes of cardiovascular drift.

Marking guidance

Candidate must stress "extended periods" of exercise in hot conditions or equivalent. Do not accept exercising in the heat only.
Do not accept descriptions of CV drift such as an increase in heart rate. Answers must relate to causes.

Marking points (maximum 2)

- (1) [AO 1] Extended periods of exercise in hot conditions
- (2) [AO 1] Excess sweating/Onset of dehydration
- (3) [AO 1] Loss of blood plasma/Increased blood viscosity
- (4) [AO 1] Decreased stroke volume

3. Describe **two** long-term **neural** adaptations to strength training.

Marking points (maximum 2)

- (1) [AO 1] Increased coordination of antagonistic pairs
- (2) [AO 1] Increased speed of nerve transmission

4. Look closely at this image.
State both missing stages of periodisation.
-

Marking guidance

Only accept the phrasing of "competitive" and "transition". Terms such as "mid-season" or "close-season" are incorrect.

Marking points (maximum 2)

- (1) [AO 1] Competitive phase/Competitive
- (2) [AO 1] Transition phase/Transition

5. Look closely at this image.
Describe the type of contraction occurring in the triceps when moving from position A to position B.
-

Marking guidance

Do not accept "isotonic".

Do not accept "lengthening" or "relaxing". For "lengthening" to be correct, it must be combined with "under tension" or equivalent.

Marking points (maximum 2)

- (1) [AO 2] Isotonic eccentric contraction/Eccentric
- (2) [AO 2] Lengthening under tension
- (3) [AO 2] Acting as a brake

6. Look closely at this image.
Analyse the landing phase on the box by completing the table.
-

Marking points (maximum 6)

- (1) [AO 3] A is a ball-and-socket joint/A is ball-and-socket/A ball-and-socket
- (2) [AO 3] B is hip flexion/B is flexion/B hip flexion
- (3) [AO 3] C is the gluteus maximus/C is gluteus maximus/C gluteus maximus
- (4) [AO 3] D is a hinge joint/D is hinge/D hinge
- (5) [AO 3] E is knee flexion/E is flexion/E knee flexion
- (6) [AO 3] F is the rectus femoris/F is the vastus lateralis/F is the vastus medialis

7. The vascular system is responsible for venous return.
Describe what happens to the skeletal muscle pump and the respiratory pump during a recovery period.
-

Marking guidance

Only accept answers specific to the skeletal muscle pump and the respiratory pump.
The candidate must state less force is applied in each case to achieve the mark.

Marking points (maximum 2)

- (1) [AO 1] Skeletal muscle pump applies less force to veins
- (2) [AO 1] Respiratory pump applies less force to the thoracic cavity

8. Explain how a middle-distance runner is able to exchange a greater quantity of gases at the alveoli when performing.
-

Marking guidance

All six points should make use of terms such as "greater", "more", "increased", etc. A candidate writing that exchange happens by diffusion, for example, is not answering the question unless they are stating a faster rate of diffusion.

Marking points (maximum 6)

- (1) [AO 1] A greater rate of diffusion occurs
- (2) [AO 1] Deeper breathing causes deeper alveoli to be accessed increasing the surface area for diffusion
- (3) [AO 1] More carbon dioxide is produced as a reactant from aerobic exercise
- (4) [AO 1] Less oxygen is returning to the lungs as more is being utilised at the cells
- (5) [AO 1] Concentration gradient of oxygen between the alveoli and capillaries is greater
- (6) [AO 1] Oxygen diffuses at a faster rate into the blood
- (7) [AO 1] Concentration gradient of carbon dioxide between the capillaries and alveoli is greater
- (8) [AO 1] Carbon dioxide diffuses at a faster rate into the alveoli

9. Look closely at this image.
Calculate the missing values.
-

Marking points (maximum 3)

- (1) [AO 3] A is 124
- (2) [AO 3] B is 95.8/B is 96
- (3) [AO 3] C is 14,960

10. State the controlling enzyme and the fuel source of the ATP/PC system.
-

Marking points (maximum 2)

- (1) [AO 1] Enzyme is creatine kinase/Creatine kinase
- (2) [AO 1] Fuel is phosphocreatine/Creatine phosphate/Phosphocreatine

11. Other than the water jump, Identify one point of a 3,000m steeplechase race when the ATP/PC system would be predominant.
-

Marking guidance

The answer must provide a moment from a steeplechase. Do not accept "when accelerating", for example.

Marking points (maximum 1)

(1) [AO 2] When jumping hurdles/Sprint finish/Acceleration at the start of the race

12. State **one** reason why a 3,000m steeplechase athlete is likely to consume protein **immediately after** an intense training session.
-

Marking guidance

The candidate must state greater/faster in relation to their answer. Stating "proteins cause muscle repair" is not correct in the context of this question. This does not answer why the athlete is consuming protein immediately after their training session.

Marking points (maximum 1)

(1) [AO 2] Faster adaptations/Recovery more quickly/Ready to train again sooner

(2) [AO 2] Greater muscle repair and growth/Greater muscle repair/Greater muscle growth

13. Describe the role of fats during an elite 3,000m steeplechase race.
-

Marking points (maximum 2)

(1) [AO 2] Fats are a fuel source for the aerobic system/Beta oxidation

(2) [AO 2] Fats would provide relatively little energy to a race as the intensity would be too high

14. Describe the Queen's College step test.

Marking points (maximum 4)

- (1) [AO 1] Use a 41.3cm step
- (2) [AO 1] Step up and down at a set cadence/Step up and down continuously
- (3) [AO 1] 24 steps per minute for men/Metronome beats 24 times per minute for men
- (4) [AO 1] 22 steps per minute for women/Metronome beats 22 times per minute for men
- (5) [AO 1] Test lasts 3 minutes/3 minutes test duration
- (6) [AO 1] /Heart rate is taken 5 seconds after completing the test/Measure heart rate during recovery

15. Explain why an athlete would complete HIIT as part of their aerobic training.

Marking points (maximum 4)

- (1) [AO 2] Work relief ratios are appropriate for aerobic work/2:1/1:0.5
- (2) [AO 2] Recovery periods stress the aerobic systems
- (3) [AO 2] Consumes large quantities of calories per unit of time
- (4) [AO 2] Greater fat burning potential/Burns more fat/More bet oxidation
- (5) [AO 2] Aerobic adaptations occur rapidly
- (6) [AO 2] Aerobic athletes can build high intensity into their performances
- (7) [AO 2] Sessions are short/Do not last long
- (8) [AO 2] Athletes of differeing levels can train together

16. State **one** pharmacological ergogenic aid that would help an open water swimmer to increase their aerobic capacity.

Marking points (maximum 1)

- (1) [AO 2] Erythropoietin/RhEPO/EPO

17. Explain how the pharmacological ergogenic aid named in the previous question is able to increase aerobic capacity.
-

Marking points (maximum 4)

- (1) [AO 2] Stimulates the production of red blood cells/Increased production of red blood cells/Stimulates erythropoiesis
- (2) [AO 2] Increased haematocrit/Greater proportion of blood is red blood cells
- (3) [AO 2] Increased oxygen transport capacity
- (4) [AO 2] Delayed OBLA
- (5) [AO 2] Athlete can work at higher intensities aerobically

18. Evaluate the use of PNF training.
-

Marking points (maximum 4)

- (1) [AO 3] Strength is that it inhibits the stretch reflex
- (2) [AO 3] Strength is that an athlete can stretch through a greater RoM without weeks of stretching
- (3) [AO 3] Strength is that flexibility can be rapidly improved
- (4) [AO 3] Weakness is that PNF can be contraindicating/Stretches are high intensity and capable of causing muscle damage
- (5) [AO 3] Weakness is that PNF requires a partner in most cases
- (6) [AO 3] Weakness is that the partner cannot feel the point of resistance themselves/Technically challenging for the partner

19. Electric racing cars carry their batteries underneath the floor.
Explain why this helps to increase the stability of the car when cornering.
-

Marking points (maximum 1)

- (1) [AO 2] Car has a low centre of mass causing an increase in stability

20. Look closely at this image.
Explain why a racing car travelling around track A is likely to have a smaller rear wing than a racing car travelling around track B.
-

Marking points (maximum 3)

- (1) [AO 2] Track A has many more straights than track B/Track B is twistier
- (2) [AO 2] Track A requires less downforce/Track B requires more downforce
- (3) [AO 2] Rear wings are inverted aerofoils and create downforce/Rear wings cause a Bernoulli dowforce/Bernoulli lift force down

21. Look closely at this image of image of a shuttlecock in flight.
Using your knowing of fluid mechanics, explain why the shuttlecock has such a large air resistance.
-

Marking points (maximum 5)

- (1) [AO 2] Travelling at very high velocity
- (2) [AO 2] Mass of the shuttlecock is very low
- (3) [AO 2] Forntal cross-sectional area is large because the shuttlecock fans outward
- (4) [AO 2] Shape is not streamlined
- (5) [AO 2] Surface characteristics are rough

22. Look closely at this image which represents a shot being putted.
Analyse the state of motion at each point.
-

Marking points (maximum 5)

- (1) [AO 2] A is the shot being held before it is putted
- (2) [AO 2] B is the shot accelerating as the thrower moves across the circle and extends their elbow and wrist
- (3) [AO 2] C is constant velocity as the shot is in flight
- (4) [AO 2] D is rapid deceleration as the shot hits the ground
- (5) [AO 2] E is the shot resting on the ground

23. Look closely at the table in this image.
Identify the three classifications of levers A, B and C.
Identify the three components X, Y and Z of the bottom lever classification in the table.
-

Marking guidance

For X, Y and Z, accept reference to either elbow extension or neck extension.

Marking points (maximum 6)

- (1) [AO 2] A is a 2nd class lever
- (2) [AO 2] B is a third class lever
- (3) [AO 2] C is a first class lever
- (4) [AO 2] X is the elbow joint/X is the neck joint/X is atlas and axis joint
- (5) [AO 2] Y is the weight of a javelin/Y is white weight of the forearm/Y is the weight of the head
- (6) [AO 2] Z is the insertion of the triceps muscle on the ulna/Z is the insertion of the neck muscles on the cranium

24.

Explain how blood is redistributed by a player during a netball match. Identify treatment methods for exercise-induced muscle damage **and** evaluate the effectiveness of these treatments for a netball player.

Marking guidance

Refer to 20-mark level descriptors:
Accept alternative strengths and weaknesses of treatments.



Marking points

- (1) [AO 1] Redistribution occurs due to vasodilation and vasoconstriction of arterioles
- (2) [AO 1] Redistribution occurs due to vasodilation and vasoconstriction of pre-capillary sphincters
- (3) [AO 1] Redistribution of cardiac output to areas of most need
- (4) [AO 2] During the match, up to 80% of cardiac output will be distributed to the working muscles
- (5) [AO 2] By the vasodilation of arterioles and pre-cappillary sphincters leading to the muscle
- (6) [AO 2] Controlled by parasympathetic control
- (7) [AO 2] During the match, as little as 20% of cardiac output will be distributed to other organs
- (8) [AO 2] By the vasoconstriction of arterioles and pre-capillary sphincters leading to the other organs
- (9) [AO 2] Controlled by sympathetic control
- (10) [AO 1] Painkillers can be used as a treatment/Painkillers
- (11) [AO 3] Strength of painkillers is that they dull the netballer's pain and allow them to use the injured area
- (12) [AO 3] Weakness of painkillers is they can mask pain and make further damage possible
- (13) [AO 1] Anti-inflammatories can be used as a treatment/Anti-inflammatories
- (14) [AO 3] Strength of anti-inflammatories is they help to prevent swelling and make the injured area more mobile
- (15) [AO 3] Weakness of anti-inflammatories is they can cause feelings of sickness
- (16) [AO 1] Massage can be used as a treatment/Massage
- (17) [AO 3] Strength of massage is it is very localised and can be used on a specific zone
- (18) [AO 3] Weakness of massage is that it is not often available to players so is not practical
- (19) [AO 1] Stretching can be used as a treatment/Stretching
- (20) [AO 3] Strength of stretching is it can be done at any time

24.

Explain how blood is redistributed by a player during a netball match. Identify treatment methods for exercise-induced muscle damage **and** evaluate the effectiveness of these treatments for a netball player.

(21) [AO 3] Weakness of stretching is that it can cause pain in the injured muscle

(22) [AO 1] Hot and cold contrast therapies can be used as a treatment/Hot and cold therapies/Contrast therapies

(23) [AO 3] Strength of hot and cold therapy is that it speeds up recovery from muscle injury

(24) [AO 3] Weakness of hot and cold therapy is it is only effective once healing has begun

(25) [AO 1] Physiotherapy can be used as a treatment/Physiotherapy/Physio

(26) [AO 3] Strength of physiotherapy is that it is specific and localised

(27) [AO 3] Weakness of physiotherapy is that it is expensive

(28) [AO 1] Surgery can be used as a treatment/Surgery

(29) [AO 3] Strength of surgery is it can be used for very serious muscle injuries

(30) [AO 3] Weakness of surgery is that very few muscle injuries can be treated this way