The EverLearner

National Mock Exams 2024

POWERED BY ExamSimulator

# Model Answers
# OCR A-level PE - Paper 1

**This document contains:**

- Model answers for the National Mock Exam questions
- Model examples of extended writing

**How should schools use these papers?**

These model answers are written to support PE teachers and students review the National Mock Exam 2024 and to prepare for the live revision session delivered by James in April 2024. We strongly recommend that students learn these model answers in preparation for the summer exams 2024. The questions posed and the answers provided are based on significant analysis and model BOTH content and skills.

Please, use these model answers in combination with the National Mock Exam paper, mark scheme and the revision session (Monday, 29th of April 2024, 15:00-16:30), available via the OCR A-level PE Revision page:

**https://pages.theeverlearner.com/2024-ocr-a-level-pe-revision**

All questions are taken from ExamSimulator. ExamSimulator is a premium resource available via TheEverLearner.com.

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

*James Simms*

The EverLearner

| | |
|---|---|
| **Subject** | Physical Education |
| **Course** | OCR Linear GCE PE Paper 1: Physiological Factors |
| **Time allowed** | 2 hours |

| | |
|---|---|
| **First name** | |
| **Last name** | |
| **Class** | |
| **Teacher** | |

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|---|---|
| **Title** | OCR A-level (H555) Paper 1: Physiological Factors National Mock Exam 2024 |

| | |
|---|---|
| **Guidance** | • This paper is marked out of 90 marks.<br>• You have 120 minutes (plus additional time for those who have Exam Access Arrangements).<br>• Answer all questions.<br>• A calculator is permitted for this exam.<br>• This paper contains one 20-mark question.<br>• Good luck. |

| | |
|---|---|
| **Total marks** | 90 |

**1.** Identify **two** functions of protein in a balanced diet.

Function 1: Protein is broken down to produce amino acids.

Function 2: Protein assists in the repair of body tissue.

Marks: [2]

**2.** Explain why a table tennis player may use caffeine as a nutritional ergogenic aid.

Caffeine helps the table tennis player to increase alertness so they can anticipate which way the ball is travelling during a rally. Caffeine also decreases reaction time, which helps the player react quickly to return a shot when the ball is hit powerfully towards them.

Marks: [2]

**3.** Identify **two** sporting activities where a high percentage of fast oxidative glycolytic muscle fibres would be beneficial.

Activity 1: 800-metre running.

Activity 2 During multiple phases of play in rugby.

Marks: [2]

**4.** Using a sporting example, describe what is meant by tapering.

Tapering is maintaining the intensity but reducing the volume of training in preparation for competition. For example, a runner will reduce the number of training miles completed by one third during their tapering period.

Marks: [2]

**5.** Stability is defined as "the ability of the body to remain in a balanced position".
Describe factors that affect stability.

Stability can be affected by the size of the base of support. A larger base of support leads to greater stability. Stability is also affected by the height of the centre of mass: the lower the centre of mass, the greater the stability.

Marks: [2]

**6.** Complete the table to analyse the press-up action at the elbow. Ensure your responses are correctly linked to the relevant letter in your answer.

| Joint | Phase | Joint movement | Agonist | Type of contraction |
|---|---|---|---|---|
| Elbow | Upward | A | B | C |
| | Downward | D | E | F |

A is: Extension

B is: Triceps brachii

C is: Isotonic contraction

D is: Flexion

E is: Triceps brachii

F is: Isotonic eccentric contraction

Marks: [6]

**7.** Explain how venous return mechanisms assist in the return of blood back to the heart.

Pocket valves are located in the veins and prevent the backflow of blood, ensuring blood flows in one direction. Smooth muscle in the vein walls creates venomotor tone, which aids movement of the blood. Respiratory pump squeezes the blood back to the heart due to a pressure difference in the thoracic cavity. Gravity assists in blood above the heart from the upper body returning towards the heart. Skeletal muscle pump from the contraction of skeletal muscles forces blood in the veins back towards the heart.

Marks: [5]

**8.** Describe the ATP- PC energy system.

The ATP-PC system is used during high-intensity activity. PC is broken down in the sarcoplasm. This leads to energy being released for ATP resynthesis. This creates a coupled reaction, whereby the breakdown of PC releases the energy to resynthesise ATP. The reaction occurs without the presence of oxygen.

Marks: [6]

**9.** Explain why a coach would encourage an endurance athlete to attend a high altitude training camp.

Attending a high-altitude training camp allows the athlete to become acclimatised to the conditions ready for competition. By going through this acclimatisation process, it is less likely the athlete will experience altitude sickness or breathlessness when performing. Training at high altitude leads to an increase in concentration of red blood cells, making oxygen transport efficient.



Marks: [3]

**10.** Dynamic flexibility and maximum strength are both fitness components important in sport. Describe a sporting situation where **each** would be used.

Dynamic flexibility: Dynamic flexibility is needed at the shoulder when throwing a javelin.

Maximum strength: Maximum strength is needed when completing a one rep max for a bench press.

Marks: [2]

**11.** Identify **three** tests which assess aerobic capacity.

Test 1: Cooper 12-minute run

Test 2: Queen's College step test

Test 3: Multi-stage fitness test

Marks: [3]

**12.** Evaluate the use of continuous training as part of a training programme for a triathlete.

Continuous training is useful for a triathlete, as it's cheap and easy to set up as a training method. Continuous training is also specific and can be used to train all three aspects of a triathlon. However, continuous training can become monotonous for the athlete, which causes demotivation. Continuous training is also a cause of chronic injuries due to its repetitive nature.

Marks: [4]

**13.** Describe the process of glycogen loading.
Evaluate the effectiveness of glycogen loading as an ergogenic aid.

Description Glycogen loading can be described as the manipulation of carbohydrate intake in the week prior to competition. It involves depleting glycogen stores through exercise at the start of the week, before increasing the amount of carbohydrates in days 5 -7, whilst reducing the training load.

Evaluation This leads to an increase in glycogen stores by up to 50% and means the athlete takes longer to reach exhaustion during the performance. However, glycogen loading can cause hypoglycemia and can make the performer feel lethargic.

Marks: [5]

**14.** Name and describe two types of fracture that could occur when playing sport.
Give sporting examples of the possible cause of each type of fracture.

Fracture type 1: Compound fracture

Description: In a compound fracture, the fractured bone breaks the skin.

Example: An example of a compound fracture is a footballer being tackled above the shin pad and the impact fracturing the tibia and it breaking the skin.

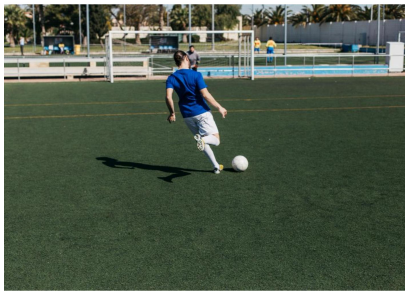
Fracture type 2: Simple fracture

Description: The bone does not break the skin.

Example: An example of this is a fielder in cricket trying to catch a hard-hit ball and fracturing a bone in their hand without it breaking the skin.

Marks: [6]

**15.** Look closely at this image. Explain how Newton's three laws of motion could be applied to the footballer when taking a shot.



Newton's first law can be applied, as the ball will remain at rest on the penalty spot until the penalty taker kicks it. The first law also states that the object will remain at constant velocity until an external force acts upon it. This can be seen by the ball travelling at a constant velocity until air resistance is applied to the ball to slow it down. The second law states that size of force will affect the acceleration of an object, so how hard the penalty taker kicks the ball will affect its acceleration towards goal. If the player kicks the ball on the side to create curl or spin, acceleration of the ball directly towards goal will be slower. Newton's third law states that for every action there is an equal and opposite reaction. This can be applied if the ball hits the post, as the action force of the ball hitting the post will be equal to the reaction force of it rebounding. Equally, if the goalkeeper saves the penalty with their hand, the action force of the ball hitting the glove will be equal to the reaction force of the ball rebounding off the glove and away from goal.

Marks: [6]

**16.** Explain how a tennis player creates topspin on the ball when playing a forehand shot.

The tennis player produces topspin by applying an off-centre force to the ball. This leads to the ball spinning forwards during its flight. A downward Magnus force is created and the ball follows a shortened, non-parabolic flight path.

Marks: **[4]**

**17.** Identify **two** factors that affect the magnitude of drag acting on a body moving through water.

Factor 1: Smoothness of the surface

Factor 2: Velocity

Marks: **[2]**

**18.** For a sport of your choice, describe a piece of biomechanical technology that is used to analyse performance.

Wind tunnels can be described as a type of technology which measures the aerodynamics around an object, including air resistance and drag. We find an example of this in cycling, where a wind tunnel can be used to control environmental variables such as wind speed or direction in order to analyse the effect on both the cyclist and their bike.

Marks: [2]

**19.** Explain why a hard-hit shuttlecock follows a non-parabolic flight path.

The shuttlecock follows a non-parabolic flight due to its rough surface characteristics. This increases air resistance and affects the flight of the shuttle. The shuttlecock is also very light, so air resistance is dominant and shortens its flight path.

Marks: [2]

**20.** Look closely at this image. Explain how the ice skater manipulates their body shape to spin on the ice.

The skater is able to increase their spin rate by bringing their legs and arms closer to the longitudinal axis. By tucking their arms and legs in, it also increases their angular velocity and decreases their moment of inertia. This leads to a faster spin.

Marks: [4]

**21.** Analyse the regulation of heart rate during exercise.
Describe the different types of cardiovascular disease that could occur as a result of long-term physical inactivity.

During exercise, heart rate is regulated through the cardiac control centre (CCC), which receives information from the sensory nerves and sends instructions to the motor nerves to change heart rate. There are three main control mechanisms that determine the action of the CCC. These are neural control, intrinsic control and hormonal control. Neural control takes place through chemoreceptors located in the muscles, aorta and carotid arteries. These chemoreceptors act by detecting changes in blood acidity. Proprioceptors are also a source of neural control in the muscles, tendons and joints. These inform the CCC of movement. Lastly, baroreceptors in the blood vessel walls detect increases in blood pressure and inform the CCC of this. Intrinsic control includes venous return changes, which lead to ventricle walls being stretched and, therefore, stroke volume increasing. Hormonal control occurs through the release of adrenaline and this also increases the force of ventricular contraction in the heart and, therefore, also contributes to increased stroke volume. Based on the information provided to the CCC by these control mechanisms, the CCC will then lower or raise heart rate to meet demand.
Atherosclerosis is a cardiovascular disease which can be described as a build-up of fatty deposits that form on the arterial walls. These narrow the lumen, which reduces blood flow and can increases the chances of blood clots. Coronary heart disease is a result of atherosclerosis. The reduction in blood flow and oxygen supply means the cardiac muscle loses ability to respire and a heart attack occurs. Heart attacks can also occur as a result of fatty deposits breaking away from the arterial wall to form a blood clot.This blocks the artery and cuts off oxygen supply to the cardiac muscle. Another cardiovascular disease is a stroke. Strokes are caused by a blockage in the cerebral artery or from a blood vessel bursting on the surface of the brain.

Marks: [20]

**END OF PAPER**