The EverLearner

National Mock Exams 2025

POWERED BY ExamSimulator

Mark Scheme

BTEC Level 3 Sport Unit 1

(Anatomy and Physiology)

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 2025 infographics. Please, note the following:

- We believe this mark scheme has a very strong association with previous BTEC Level 3 Sport Unit 1 Anatomy and Physiology exams in relation to command terms, skills, 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 potential educational experiences of students in other schools/colleges.
- Finally, please make sure you attend the associated revision session in April.

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 2025. Many of these questions will be discussed in the live revision show provided by James Simms on **Wednesday 30th of April 2025 at 17:00** (available to all subscribing schools live and on demand; a shorter version for non-subscribers will be available on YouTube after the live session).

The paper is available to be set, answered and marked online via ExamSimulator. ExamSimulator is a premium resource available via TheEverLearner.com and provides immediate diagnostics of student writing performance after every exam answer. Get in touch with us to start a free trial.

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

James Simms

The EverLearner

Subject	Physical Education
Course	**BTEC** Level 3 Sport: Unit 1 Anatomy and Physiology
Time allowed	1 hour 30 minutes

Title	**BTEC** Sport Level 3: Unit 1 Anatomy and Physiology NME 2025

Guidance	• This paper is marked out of 80 marks. • You have 90 minutes (plus additional time for those who have exam access arrangements). • The marks for each question are shown in brackets (use this as a guide for how much time to spend on each question). • Answer all questions. • If the timer reaches zero prior to you submitting your paper, the software will automatically submit your responses. • Good luck.

Total marks	80

1. Look closely at this image. Identify the following at the ankle as the player moves from preparation to execution:
(a) Type of joint
(b) Articulating bones
(c) Movement pattern

Marking points **(maximum 3)**

(1) [AO 2] Type of joint: Hinge

(2) [AO 2] Articulating bones: Tibia, fibula and tarsals/Tibia, fibula and talus

(3) [AO 2] Movement pattern: Plantar flexion

2. State **two** skeletal adaptations from weight-bearing exercise such as running.

Marking points **(maximum 2)**

(1) [AO 2] Increased calcium deposits/Increased density of bone

(2) [AO 2] Increased strength of bone/Increased tensile capacity of the bone

(3) [AO 2] Increased strength of ligaments

(4) [AO 2] Increased stability at joints

3. Describe arthritis.

Marking points **(maximum 2)**

(1) [AO 1] Damage to the cartilage at synovial joints

(2) [AO 1] Caused by wear and tear/Osteoarthritis

(3) [AO 1] Caused by disease/Rheumatoid arthritis

4. Explain how a young athlete can prevent arthritis developing in later life.

Marking guidance

Accept other reasonable methods of avoiding arthritis.

Marking points (maximum 2)

(1) [AO 2] Perform warm-ups and cool-downs before and after every session

(2) [AO 2] Wear bracing and support on joints

(3) [AO 2] Ensure plenty of rest and recovery between sessions

(4) [AO 2] Avoid excessive repeated movements

(5) [AO 2] Attend physiotherapy if pain is experienced

5. Describe the structure **and** function of the synovial membrane.

Marking guidance

Award up to three marks for either structure or function. To achieve four marks, the candidate must have credit for **both** structure and function.

Marking points (maximum 4)

(1) [AO 1] Structure: Inside lining of the synovial cavity

(2) [AO 1] Structure: Very thin dual layer of cells

(3) [AO 1] Structure: Contains blood vessels and nerve endings

(4) [AO 1] Strucutre: Contains specialised cells for producing synovial fluid

(5) [AO 1] Function: Lubricate the joint

(6) [AO 1] Function: Reduce friction

(7) [AO 1] Function: Nourish the articular cartilage

(8) [AO 1] Function: Improve the functional range of movement

6. The image shows the muscles of the body. Identify the muscles labelled A, B and C.

Marking points **(maximum 3)**

(1) [AO 1] A is the pectoralis major/A is pectorals/A pectorals

(2) [AO 1] B is the abdominals/B is abdominals/B abdominals

(3) [AO 1] C is the quadriceps/C is quadriceps/C quadriceps

7. Explain how muscle tissue adapts to a three-month weight-training programme.

Marking guidance

Only accept adaptations that relate to strength training.

Marking points **(maximum 3)**

(1) [AO 2] Muscular hypertrophy, meaning that a muscle can apply more force to the bone

(2) [AO 2] Increase in tendon strength, meaning that more force can be transmitted from the muscle to bone

(3) [AO 2] Increase in tolerance to lactate, meaning the athlete can lift at higher intensity before reaching OBLA

(4) [AO 1] Increase in PC stores, meaning that the athlete can maintain peak strength for longer

(5) [AO 2] Increase in storage of glycogen, meaning the athlete can complete longer sets

8. Describe **two** characteristics of slow-twitch muscle fibres.

Marking points **(maximum 2)**

(1) [AO 1] Fatigue-resistant

(2) [AO 1] High aerobic capacity

(3) [AO 1] Work aerobically for long duration

(4) [AO 1] Produces the least amount of force/Low force production

(5) [AO 1] Contract with the least speed/Slow contractile speed

9. Explain why type IIx muscle fibres are recruited in a tennis match.

Marking points **(maximum 2)**

(1) [AO 2] Type IIx muscle fibres are required for an explosive serve/Quick sprint to reach a drop shot/Powerful smash

(2) [AO 2] Due to their high force of contraction/High speed of contraction/Exert the largest force

10. State **three** short-term muscular responses to a 20-minute training run.

Marking points **(maximum 3)**

(1) [AO 2] Increased blood supply

(2) [AO 2] Increased muscle temperature

(3) [AO 2] Increased muscle pliability

(4) [AO 2] Increased speed and strength of contraction

(5) [AO 2] Lactate accumulation is unlikely to occur as the exercise is not high intensity

(6) [AO 2] Microtears are unlikely as the exercise is not high intensity

11. Peri competes in biathlon. She has recently been diagnosed with asthma. State **three** possible causes of asthma.

Marking points **(maximum 3)**

(1) [AO 2] Exercising in very cold conditions

(2) [AO 2] High-intensity exercise

(3) [AO 2] Air-based pollution/Dust

(4) [AO 2] Dog or cat hairs/Animals/Pets

(5) [AO 2] Modern chemicals such as cleaning products

12. Name **two** muscles that work **actively** to cause an increase in the rate of exhalation during exercise.

Marking guidance

Do not accept any other muscles than the two named in the marking points. Do not accept any inspiratory muscles. Do not accept any muscles that are passive during exhalation.

Marking points (maximum 2)

(1) [AO 2] Rectus abdominus/Abdominals

(2) [AO 2] Internal intercostals

13. Look closely at this graph, which represents breathing before and during exercise.
Describe what happens to **both** breathing depth **and** breathing frequency at the start of exercise.

Marking points (maximum 2)

(1) [AO 2] Breathing depth increases/Tidal volume increases

(2) [AO 2] Breathing frequency increases

14. Explain how neural control of breathing changes during exercise.

Marking points (maximum 3)

(1) [AO 2] Lower partial pressure of oxygen in the blood/Lower levels of oxygen will be detected/Low ppO_2 will be present

(2) [AO 2] Higher partial pressure of carbon dioxide/Higher levels of carbon dioxide will be detected/High $ppCO_2$ will be present

(3) [AO 2] Messages are sent to the medulla oblongata/Medulla oblongata receives signals from the chemoreceptors/Medulla oblongata receives a message from the chemoreceptors

(4) [AO 2] Messages are relayed to the respiratory muscles to increase the force of contraction/Respiratory muscles receive signals from the respiratory control centre/Respiratory control centre sends signals to the respiratory muscles

(5) [AO 2] The diaphragm and intercostal muscles will work harder/Diaphragm and intercostals will contract with more force/The diaghragm and intercostals will contract more frequently

(6) [AO 2] More oxygen will enter the lungs/More oxygen will reach the capillaries/More oxygen will be inspired

(7) [AO 2] More carbon dioxide will be removed from the body/More carbon dioxide will be removed from the capillaries/More carbon dioxide will be expired

(8) [AO 2] Joe can inspire more oxygen and work aerobically for longer/Joe's muscles can be provided with more oxygen/Joe can work aerobically for longer periods

15. Analyse the process of **gaseous exchange** for a 5000m runner trying to sustain their level of performance throughout a race.

Marking guidance

BTEC Level 3 six-mark level descriptors

Marking points (maximum 6)

(1) [AO 3] Gaseous exchange occurs due to diffusion/It occurs because of a diffusion gradient/Diffusion gradient causes gaseous exchange

(2) [AO 3] High concentration of O_2 in the alveoli/High ppO_2 in the alveoli/Alveoli has a high concentration of O_2

(3) [AO 3] Greater O_2 concentration in the alveoli due to increased breathing rate during a race/More O_2 present in the alveoli during the race due to the mechanics of breathing/Greater ppO_2 in the alveoli due to more oxygen being breathed in throughout the race

(4) [AO 3] Low concentration of O_2 in the blood/Blood has a low concentration of O_2/Low ppO_2 in the blood

(5) [AO 3] Skeletal muscles are utlising O_2 throughout the race/Muscles require more O_2, leaving less in the blood/Less O_2 in the blood due to the muscles using more oxygen

(6) [AO 3] O_2 moves from the alveoli to the capillaries/O_2 diffuses across into the capillaries/Diffusion gradient will cause O_2 to move into the capillaries

(6) [AO 3] O_2 moves from the alveoli to the capillaries/O_2 diffuses across into the capillaries/Diffusion gradient will cause O_2 to move into the capillaries

(7) [AO 3] The race creates a bigger diffusion gradient/The inspiration of oxygen and the demand of O_2 during a race causes greater diffusion gradient/Whilst racing there is a larger diffusion gradient

(8) [AO 3] CO_2 in the alveoli has a low concentration/Low ppCO_2 in the alveoli/Alveoli have a low concentration of CO_2

(9) [AO 3] During a race more CO_2 is expired/The athlete will remove CO_2 more frequently/CO_2 is expired at a much faster rate during a race

(10) [AO 3] Higher concentration of CO_2 in the blood/Blood has a higher concentration of CO_2/Higher ppCO_2 in the blood

(11) [AO 3] A by-product of aerobic respiration is CO_2/During the race CO_2 is produced, so more will be in the blood/More CO_2 in the blood due to aerobic respiration

(12) [AO 3] CO_2 moves from the capillaries to the alveoli /CO_2 will diffuse across into the alveoli/Diffusion gradient will cause CO_2 to move into the alveoli

(13) [AO 3] The race creates a bigger diffusion gradient of CO_2/The inspiration of CO_2 and the muscle demand during a race causes greater diffusion gradient/Whilst racing, there is a larger diffusion gradient of CO_2

16. Describe the role of **both** platelets **and** plasma for a judo player.

Marking points **(maximum 2)**

(1) [AO 2] Platelets are capable of clotting the blood and preventing blood loss if the player's skin is scratched/Prevents blood loss if the skin is broken

(2) [AO 2] Plasma suspends glucose, which can be delivered to the player's working muscles/Dissolves oxygen which can be delivered to the player's working muscles/Dissolves carbon dioxide, which is produced when the player uses the aerobic system

17. Describe **three** functions of the cardiovascular system.

Marking points **(maximum 3)**

(1) [AO 1] Delivery of oxygen and nutrients

(2) [AO 1] Removal of waste products/Removal of carbon dioxide and lactate

(3) [AO 1] Vasoconstriction and vasodilation of blood vessels/Thermoregulation

(4) [AO 1] Fight infection

(5) [AO 1] Clot blood

18. Describe the effects of hypothermia on the CV system.

Marking points **(maximum 4)**

(1) [AO 2] Hypothermia is a decreased body temperature/Temperature below 35 degrees/Reduced core body temperature

(2) [AO 2] Causes a reduced blood flow to muscles/Less oxygenated blood reaches the muscles/Muscles can do less aerobic respiration

(3) [AO 2] Causes an increased heart rate/Heart rate rises/Cardiovascular drift occurs

(4) [AO 2] Can lead to heart arrhythmia/Can lead to disrupted heart contraction/Arrhythmia

(5) [AO 2] Can lead to heart attack/Cardiac arrest/Heart attack

19. Describe parasympathetic control of heart rate.

Marking points **(maximum 2)**

(1) [AO 1] Likely to occur post-exercise/During breaks in play

(2) [AO 1] Causes a decrease in heart rate

(3) [AO 1] Vagus nerve stimulates the SA node to fire less frequently

20. Analyse the role of the following in relation to the conduction system:
AV node
Bundle of His
Purkinje fibres

Marking guidance

BTEC Level 3 six-mark level descriptors

Marking points **(maximum 6)**

(1) [AO 3] AV node: Receives the signal from the SA node

(2) [AO 3] AV node: Emits a further signal across the ventricles

(3) [AO 3] AV node: Causes ventricular systole not atrial systole

(4) [AO 3] Bundle of His: Separates the single signal into two signals

(5) [AO 3] Bundle of His: Redirects the signal around both the left and right ventricle

(6) [AO 3] Bundle of His: Positioned in the septum

(7) [AO 3] Purkinje fibres: Cause the signal to reach every cardiac cell

(8) [AO 3] Purkinje fibres: Cause maximal ventricular systole

(9) [AO 3] Purkinje fibres: Apply the all or none law

21. Look closely at this table. State what should be written in position A, B and C.

Marking points **(maximum 3)**

(1) [AO 1] A is glycogen/A is fats/A is lipids

(2) [AO 1] B is 1:38

(3) [AO 1] C is the mitochondria

22. Explain how **two** different long-term adaptations to the aerobic system would help to optimise a triathlete's performance.

Marking guidance

Award two marks for identifying adaptations and two marks for explaining how they benefit a triathlete.

Marking points (maximum 4)

(1) [AO 2] Increased use of fats as an energy source/More efficient beta oxidation/More efficient processing of fats

(2) [AO 2] Casues glycogen sparing

(3) [AO 2] Increased storage of muscle glycogen/Larger glycogen stores

(4) [AO 2] Causes the triathlete to be able to perform at higher intensities for longer without causing OBLA

(5) [AO 2] Increased number of mitochondria/Larger mitochondria/More mitochondria

(6) [AO 2] Swim, cycle and run at higher intensities aerobically

23. Evaluate the contribution that the aerobic system makes to a competitive game of basketball.

Marking guidance

BTEC Level 3 six-mark level descriptors

Marking points (maximum 6)

(1) [AO 4] Dominates in long duration aspects of the game

(2) [AO 4] Acts as the recovery system during breaks in play such as timeouts and end-of-quarters/Recovery system when jogging back into position

(3) [AO 4] Dominates in moderate intensity aspects of the game

(4) [AO 4] Contributes small amounts of energy during higher intensity aspects of the game

(5) [AO 4] Contributes to the entirety of the 60-minute performance

(6) [AO 4] Does not build fatiguing by-products

24. Valeris is a long-distance runner specialising in half-marathon distance. Analyse how the adaptations to Valeris' cardiovascular and respiratory systems will affect their fitness when running for extended periods.

Marking guidance

Eight-mark level descriptors

Sub max of **five** marks for analysis of either the cardiovascular or muscular systems. Reference must be made to the impact on interaction between the two to achieve a top band mark.

Marking points (maximum 8)

(1) [AO 5] Valeris will be able to run at higher intensities aerobically/Valeris' finishing time will improve

(2) [AO 5] Valeris will recover more quickly after running an incline or attempting to overtake

(3) [AO 5] More capillarisation will increase the efficiency of gaseous exchange/Capillarisation will speed up gaseous exchange/Gaseous exchange will occur at a more efficient rate due to capillarisation

(4) [AO 5] Greater removal of carbon dioxide/Efficient removal of carbon dioxide/Increased diffusion of carbon dioxide from the muscles

(5) [AO 5] Greater supply of oxygenated blood to the working muscles/Muscles receive more oxygen/More oxygen to the working muscles

(6) [AO 5] This causes cardiac output to increase during exercise/Increase in the volume of blood leaving per minute/Increased Q

(7) [AO 5] Which causes an increase in stroke volume/More blood exits the heart per contraction/Increased stroke volume

(8) [AO 5] Leads to a more forceful contraction/Increased force of heart contraction/Increased systolic force

(9) [AO 5] Causes a greater return of blood to the heart/Increased venous return/More blood arriving at the right ventricle

(10) [AO 5] The process of capillarisation will occur/Increased capillary density/Increased tissue capillaries

(11) [AO 5] Adaptation will occur through cardiac hypertrophy/Cardiac hypertrophy will occur/Hypertrophy of the cardiac muscle will occur

(12) [AO 5] More effective shots at the end of a match/More effective shots at the end of long rallies/Better movement at the end of long rallies

(13) [AO 5] Delayed OBLA/Blood lactate accumulation occurs at higher intensities/Blood lactate accumulates less often

(14) [AO 5] Valeris can maintain her performance for the match/Valeris does not fatigue early/Valeris can keep going for the entire race

(15) [AO 5] Increased diffusion of oxygen means more is available to oxidise lactic acid/Breakdown of lactic acid is more efficient/Lactic acid is broken down better

(16) [AO 5] More oxygen is transported to Valeris' quadriceps/Valeris can do higher intensity work aerobically/Valeris produces less lactic acid

(17) [AO 5] Increased strength of respiratory muscles/Stronger diaphragm/Stronger intercostals

(18) [AO 5] Increased vital capacity/Increased maximal inhalation/Increased maximal exhalation

BTEC Level 3 Physical Education **6 Mark Level Descriptors**

Level	Marks	Description
	0	• No rewardable material
1	1-2	• Demonstrates isolated elements of knowledge and understanding, there will be major gaps or omissions. • Few of the points made will be relevant to the context in the question. • Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them.
2	3-4	• Demonstrates some accurate knowledge and understanding, with only minor gaps and omissions. • Some of the points made will be relevant to the context in the question, but the link will not always be clear. • Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not in a sustained way.
3	5-6	• Demonstrates mostly accurate knowledge and understanding. • Most of the points made will be relevant to the context in the question, and there will be clear links. • Displays a well developed and logical discussion which clearly considers a range of different aspects and how they interrelate, in a sustained way.

BTEC Level 3 Physical Education **8 Mark Level Descriptors**

Level	Marks	Description
	0	• No rewardable material
1	1-3	• Demonstrates isolated elements of knowledge and understanding. • Breaks the situation down into component parts and a few of the points will be relevant to the context in the question. • Limited analysis that contains generic assertions rather than interrelationships or linkages.
2	4-6	• Demonstrates some accurate knowledge and understanding. • Breaks the situation down into component parts and some of the points made will be relevant to the context in the question. • Displays a partially developed analysis that considers some interrelationships or linkages but not always sustained.
3	7-9	• Demonstrates mostly accurate knowledge and understanding. • Breaks the situation down into component parts and most of the points made will be relevant to the context in the question. • Displays a developed and logical analysis that clearly considers interrelationships or linkages in a sustained manner.