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Sports, exercise and health science
Higher level
Paper 2

29 April 2026

Zone A morning | **Zone B** morning | **Zone C** morning

Session number

2 hours 30 minutes

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Instructions to students

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all questions.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- A clean copy of the **SEHS data booklet** is required for this paper.
- The maximum mark for this examination paper is **[80 marks]**.



Answer **all** questions. Answers must be written within the answer boxes provided.

1. Race walking is an endurance event in which athletes compete on hard surfaces such as roads.

(a) Evaluate the effect of longer leg length on race walking performance.

[2]

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Data were collected for a group of race walkers. **Table 1** shows average ankle joint angles and velocity during normal and race walking.

Table 1: Average ankle joint angles and velocity during normal and race walking

	Normal walking	Race walking
Ankle dorsiflexion (°)	15.81	20.30
Ankle plantarflexion (°)	3.77	15.61
Ankle angular velocity (°s ⁻¹)	36.06	73.53

(b) Using **Table 1**, suggest **one** likely cause of injury during race walking.

[1]

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(This question continues on the following page)



(Question 1 continued)

- (c) Explain **three** ways to prevent injury during race walking.

[3]

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- (d) A race walker competes in a hot and humid climate. Discuss cardiovascular drift and how the race walker can reduce its effects.

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- (e) Discuss **three** factors that could affect a race walker's motivation when returning to training following an injury.

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2. A strength and conditioning coach is asked to prepare a strength training programme for a 55-year-old male with no previous training history.

- (a) Outline **two** factors the coach must consider before designing the programme. [2]

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- (b) Apply **three** training principles to a strength training programme designed for this individual. [3]

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- (c) Outline **two** signs of potential overtraining for this individual. [2]

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(Question 2 continued)

The coach includes squats in the strength training programme.



- (d) State the movement of the knee joint during the downward phase of a squat. [1]

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- (e) Outline **two** ways a mastery climate could impact the long-term success of the training programme. [2]

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(This question continues on page 7)



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(Question 2 continued)

- (f) Using examples, apply the three types of goal to an individual starting a strength training programme.

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- (g) Explain **two** limitations of goal setting.

[2]

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3. (a) At the 2024 Paris Olympics, the winner of the women's 400 m race finished in 48.17 seconds. Describe **two** factors contributing to fatigue during the 400 m race. [2]

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- (b) Explain the process of muscle contraction within a sarcomere as calcium ions bind to troponin. [5]

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- (c) An athlete's arousal levels increase at the start of a race, causing a release of epinephrine. Apply **three** effects of epinephrine on the athlete. [3]

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(Question 3 continued)

(d) Describe how the body responds to changes in blood pH during a race.

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(e) Discuss how anxiety could affect the performance of an athlete during a race.

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(Question 3 continued)

- (f) Outline **four** ways the athlete could use mental imagery to reduce their anxiety at the start of the 400 m race.

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- (g) Elite athletes often have a high level of mental toughness. List **three** attributes of mental toughness.

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- (h) On completion of the 400 m race the athlete will complete their recovery protocol, which includes cold water immersion. Evaluate cold water immersion as a recovery method.

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4. Scrums are part of a rugby game. **Figure 1** shows a scrum.

Figure 1: Rugby scrum



- (a) A player in a scrum pushes with a force of 800 N over a distance of 2 m in 4 seconds. Calculate the work done (J) by the player and their power output (W).

[2]

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(This question continues on the following page)



(Question 4 continued)

In rugby, players often collide at high speed, which can lead to concussion. **Figure 2** shows a collision in rugby.

Figure 2: Collision in rugby



(b) Outline **four** strategies to reduce the risk of concussion during a rugby game.

[4]

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(Question 4 continued)

- (c) Outline **three** factors that may affect the flight path of a rugby ball as it is passed between players.

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- (d) Discuss the use of the psychological refractory period during a team sport such as rugby.

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(Question 4 continued)

Tackles are part of a rugby game. During the tackle, the defending player aims to wrap their arms around their opponent, at or below the waist, and bring them to the ground. **Figure 3** shows a tackle in rugby.

Figure 3: Rugby tackle



- (e) Describe **three** ways a rugby player could reduce the grip of an opponent who is tackling them.

[3]

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(Question 4 continued)

(f) Outline ATP production of the oxidative system.

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(g) A rugby game lasts 80 minutes with a half-time break after the first 40 minutes. State which macronutrient players should consume during the break to optimize their performance in the second half.

[1]

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(h) Contrast linear and non-linear pedagogical approaches to teaching a rugby tackle.

[5]

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References:

- Table 1** Song, Q., Ding, Z., Mao, D., Zhang, V. and Sun, W. (2013). Biomechanics and injury risk factors during race walking. *ISBS Conference Proceedings Archive*, [e-journal] Available at: <https://www.iat.uni-leipzig.de/datenbanken/iks/sponet/Record/4032867> [Accessed 31 August 2024]. Source adapted.
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- Figure 1** NoSystem images, 2023. *Rugby teams performing scrum - stock photo*. [image online] Available at: <https://www.gettyimages.co.uk/detail/photo/rugby-teams-performing-scrum-royalty-free-image/1457376011> [Accessed 5 June 2025]. Source adapted.
- Figure 2** vm. 2020. *Female rugby player getting tackled*. [image online] Available at: <https://www.gettyimages.com.au/detail/photo/female-rugby-player-getting-tackled-royalty-free-image/1198693510> [Accessed 11 June 2025]. Source adapted.
- Figure 3** peepo. 2017. *Women rugby players in mid tackle during stadium rugby match - stock photo*. [image online] Available at: <https://www.gettyimages.co.uk/detail/photo/women-rugby-players-in-mid-tackle-during-stadium-royalty-free-image/877141614> [Accessed 5 June 2025]. Source adapted.



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