Diploma Programme
Programme du diplôme
Programa del Diploma

Sports, exercise and health science
Higher level
Paper 1A

28 April 2026

Zone A afternoon | **Zone B** afternoon | **Zone C** afternoon

1 hour 45 minutes [Paper 1A and Paper 1B]

Instructions to students

- Do not open this examination paper until instructed to do so.
- Answer all the questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet 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 paper 1A is **[40 marks]**.
- The maximum mark for paper 1A and paper 1B is **[65 marks]**.

2226 – 4916

14 pages

1. Which applies to baroreceptors within the body?

A. Monitor movement within the tendon–muscle complex to activate glucagon

B. Relay chemical changes within the blood to the respiratory system

C. Respond to vascular pressure stimuli to activate the nervous system

D. Detect changes in the internal temperature of organs to stimulate sweating

2. Which describes the roles of insulin and glucagon in regulating blood sugar concentration?

	Insulin	**Glucagon**
A.	Increases blood sugar by promoting glucose release from the liver	Decreases blood sugar by promoting glucose uptake by adipose tissue
B.	Decreases blood sugar by promoting glucose uptake by cells	Increases blood sugar by stimulating glucose release from the liver
C.	Decreases blood sugar by stimulating glucose absorption in the intestines	Decreases blood sugar by promoting glucose uptake by cells
D.	Increases blood sugar by promoting glucose release from adipose tissue	Increases blood sugar by stimulating glucose absorption in the intestines

3. Which describes excitation of the heart?

A. The atrioventricular (AV) node directly initiates the contraction of the ventricles before the atria.

B. The sinoatrial (SA) node generates electrical impulses that cause the atria to contract, followed by the ventricles contracting after a delay at the AV node.

C. The ventricles contract first due to direct stimulation from the Purkinje fibres, followed by atrial contraction.

D. The heart relies on nervous system input to generate every heartbeat, starting at the AV node and spreading to the SA node.

4. The heptathlon is a multi-event competition covering jumping, throwing, sprinting and middle-distance running. A heptathlete is about to compete at a high-altitude competition with no prior exposure to high altitudes. What effect may high altitude have on their performance?

A. No impact on jumping, throwing or sprinting but may increase their performance in middle-distance running

B. No impact on jumping, sprinting or middle-distance running but would increase performance in throwing

C. Increased performance in jumping, throwing and sprinting, but decreased performance in middle-distance running

D. Increased performance in jumping and throwing, no impact on sprinting and decreased performance on middle-distance running

5. Cardiovascular data from four women is provided. Which data would suggest a healthy, aerobically trained adult?

	Resting heart rate / bpm	**Maximal heart rate / bpm**	**Resting stroke volume / ml**	**Resting blood pressure / mmHg**
A.	48	183	90	117/75
B.	93	170	70	140/90
C.	60	205	50	115/66
D.	72	198	60	120/80

6. Oxygen concentration levels vary between alveoli and pulmonary capillaries, creating an oxygen diffusion gradient. Which causes a larger gradient during aerobic exercise?

A. Greater arteriovenous oxygen difference due to increased muscle respiration

B. Faster respiratory rate during maximal aerobic work

C. Greater inhalation of oxygen during increased ventilation

D. Faster removal of carbon dioxide due to increased forced exhalation

7. Which regulate electrolyte balance?

I. Hypothalamus
II. Pituitary gland
III. Kidneys

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

8. Which micronutrient is found in myoglobin?

A. Calcium

B. Iron

C. Sodium

D. Potassium

9. Which causes the early use of lipids as the predominant fuel source during aerobic exercise?

A. High respiration and heart rates

B. Low cardiovascular fitness levels

C. High water saturation levels

D. Low carbohydrate availability

10. Which is a role of the gut microbiome in nutrient uptake?

A. Directly absorbs nutrients from food for human cellular respiration

B. Breaks down carbohydrates and produces short-chain fatty acids for absorption

C. Increases the production of stomach acid leading to faster digestion

D. Primarily breaks down lipids and has no role in vitamin synthesis

11. What influence do age and sex differences have on maximal oxygen consumption (VO_2max)?

A. VO_2max peaks for both sexes after maturation and declines through adulthood.

B. VO_2max is lower in females than in males before puberty but similar after puberty.

C. VO_2max for males and females increases progressively from childhood to old age.

D. VO_2max for females is higher than in males until females are post-menopausal.

12. Which delays the lactate inflection point during exercise?

A. Accumulation of lactate due to the efficiency of the respiratory system

B. Removal of carbon dioxide due to the efficiency of the glycolytic system

C. Consumption of lipids before exercise and efficiency of cellular respiration

D. Availability of oxygen and the efficiency of the cardiovascular system

13. A basketball player plans their training around a macrocycle. What is the focus of the transition period?

A. Enhancing power using plyometric training

B. Developing strength of injury-prone muscles using resistance bands

C. Practicing skills under pressure using a constraints-led approach

D. Improving aerobic capacity through high-intensity intervals

14. Which of the following is an indication of fatigue?

A. An increase in creatine phosphate stores due to training

B. A reduction in carbohydrate stores after repeated trials

C. Increase in calcium ion availability for release in muscles

D. A reduction in hydrogen ions within the blood

15. Which method is used to evaluate sleep recovery after physical exertion?

A. Measuring melatonin levels within the bloodstream

B. Tracking heart rate values through wearable technology

C. Monitoring glycogen replenishment during sleep cycles

D. Assessing respiratory volumes during rest and exercise

16. Which apply to the axial skeleton of the upper body?

I. Gives support to the shoulder girdle
II. Provides protection through the scapula
III. Allows movement when breathing

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

17. The diagram shows a tennis player serving a ball. Which occurs at the shoulder as the tennis player connects with the ball at the highest point of the serve, bringing the racket forward and down?

A. Extension

B. Flexion

C. Abduction

D. Adduction

18. Which explains the reason(s) for manufacturing shorter field hockey sticks for younger performers?

I. Prevents potential injuries through appropriate posture

II. Improves skill development by allowing greater control

III. Enables greater velocity due to a shorter lever

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

19. What is the role of reciprocal inhibition during exercise?

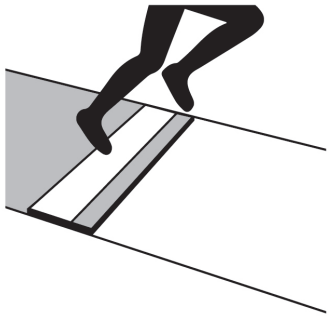
A. It allows both the agonist and antagonist muscles to contract simultaneously.

B. It prevents muscle contractions during passive stretching.

C. It causes the antagonist muscle to relax when the agonist muscle contracts.

D. It inhibits the flow of blood to muscles during maximal exercise.

20. The diagram shows a long jumper beginning their jump. Which describes the mechanical advantage of the lever in the ankle as a long jumper's foot takes off from the board?



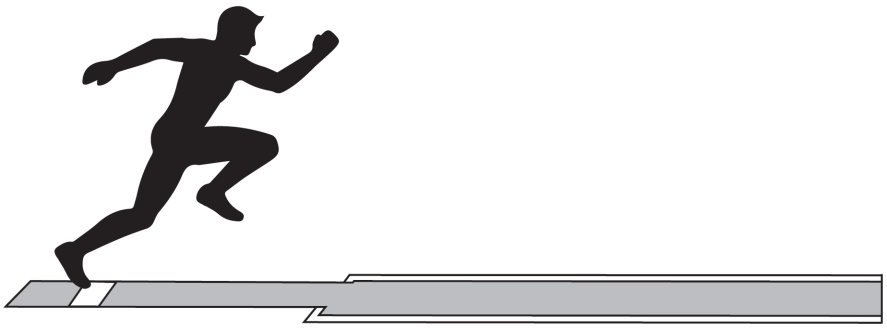
A. The load arm is shorter than the effort arm and there is high mechanical advantage.

B. The load arm and the effort arm are similar lengths and there is no mechanical advantage.

C. The load arm is long and the effort arm is short and there is no mechanical advantage.

D. The load arm and the effort arm are similar lengths and there is high mechanical advantage.

21. Resultant force is affected by the relationship between air resistance, friction, weight and ground reaction force. Which relationship causes the resultant force at take-off during a long jump?



A. Greater air resistance than friction, equal weight and ground reaction force

B. Greater friction than air resistance, greater ground reaction force than weight

C. Equal air resistance and friction, equal weight and ground reaction force

D. Greater air resistance than friction, greater ground reaction force than weight

22. An impact experiment looked at the effect of dropping different types of balls on the same surface. Which ball has the greatest coefficient of restitution?

	Velocity before impact / m s^{-1}	**Velocity after impact / m s^{-1}**
A.	2.03	1.76
B.	1.78	1.11
C.	1.56	1.08
D.	1.98	1.82

23. Which would result in the greatest horizontal distance when throwing a shot in shot-put?

	Speed of release / m s^{-1}	Height of release / cm	Angle of release / degrees
A.	12	170	57
B.	9	170	57
C.	12	170	37
D.	9	170	37

24. Which would increase the buoyancy of a swimmer?

A. Lower mass of the swimmer

B. Higher density of the water

C. Lower volume of displaced water

D. Higher temperature of the water

25. Which tissue undergoes trauma that causes a concussion?

A. Ligament

B. Cartilage

C. Brain

D. Muscle

26. Which are examples of initial treatment for joint inflammation?

I. Cooling the area with ice and immobilizing the joint

II. Use of NSAIDs

III. Consumption of polyphenols, found in plant-based foods

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

27. An athlete is struggling with their emotional balance and regulation when unexpected events take place which they perceive as stressful. Which of “the big five” personality traits could be used to describe the athlete’s response?

A. Conscientiousness

B. Extraversion

C. Agreeableness

D. Neuroticism

28. A coach observes a performer in a team during a training session. The performer is not demonstrating the desired behaviours for success. Which outlines the influence of personality traits on the performer’s behaviour?

A. Personality traits are the only factors affecting behaviour and predict success in sport.

B. Personality traits combine with behaviours learned by observing influential teammates.

C. Personality traits will not change. However, the performer can imitate teammates.

D. Personality traits are only modelled on the personality traits of others during training.

29. Which is associated with non-linear pedagogy?

A. Shooting 30 times, without an opponent, from the same spot each session

B. Shooting technique is informed and practice is directed by the teacher

C. Shooting from different angles and distances in a small-sided three vs three game

D. Shooting is inconsistent in the cognitive phase but progresses to the autonomous phase

30. Which describes practice-to-performance transfer when learning a skill in baseball?

A. Understanding the biomechanics of hitting and then hitting in a game

B. Training for strength to improve hitting in a game

C. Hitting balls from a machine and then from an opponent

D. Hitting a softball then hitting a baseball

31. Which types of attentional focus are most appropriate when an athlete receives several cues simultaneously from an opposing team's players?

A. Broad, external

B. Narrow, external

C. Broad, internal

D. Narrow, internal

32. Which features of goal orientation theory result in an athlete avoiding challenges and lacking persistence?

A. Task-oriented goal-setting with a focus on learning skills

B. Task-oriented goal-setting with a focus on self-improvement

C. Ego-oriented goal-setting with a high perception of ability

D. Ego-oriented goal-setting with a low perception of ability

33. An individual has no interest in participating in physical activity and declines to join a sports team when invited. Which is the motivation and level of self-determination for this individual?

A. Amotivated and therefore has low self-determination

B. Intrinsically motivated and therefore has high self-determination

C. Autonomously extrinsically motivated and therefore has high self-determination

D. Controlled extrinsically motivated and therefore has low self-determination

34. A coach has an intrinsically motivated performer and wants to reward them. Using cognitive evaluation theory, which outlines the type of reward the coach will be giving and its impact on the performer's intrinsic motivation?

A. Informational and maintains or improves intrinsic motivation

B. Controlling and maintains or improves intrinsic motivation

C. Informational and reduces intrinsic motivation

D. Controlling and reduces intrinsic motivation

35. Which is introjected regulation within organismic integration theory?

A. Behaviours are regulated by aligning personal goals to achieve a reward

B. Behaviours are regulated by a sense of little or no choice

C. Behaviours are regulated by a desire to receive a reward

D. Behaviours are regulated by preventing feelings of guilt

36. Which foster a mastery motivational climate using the TARGET approach?

I. Performers choose the activities during training sessions.

II. Performers' accomplishments are recognized and compared with other performers'.

III. Performers focus on the process and effort involved to improve.

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

37. What does catastrophe theory suggest about performance when both cognitive and somatic anxiety are high?

A. No change

B. Optimizes

C. Improves

D. Declines

38. Which is an example of an avoidance-focused coping strategy for psychological strain?

A. Seeking information and removing the source of stress

B. Regulating feelings around stress but not changing the stressor

C. Relaxing by using self-talk to manage the strain caused by the stressor

D. Distancing oneself from the stressor to remove emotional stress

39. Which coping strategy is ineffective for athletes achieving long-term goals?

A. Thought control

B. Logical analysis

C. Relaxation

D. Distraction

40. A cricket player uses imagery to rehearse executing a perfect hit of the ball. What is the function of this imagery?

A. Motivational specific

B. Motivational general

C. Cognitive specific

D. Cognitive general

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References:

17. AnnaSqBerg, 2016. *Disabled Athlete On Wheelchair Play Tennis Sport Competition Vector - stock illustration*. [image online] Available at: https://www.gettyimages.co.uk/detail/illustration/disabled-athlete-on-wheelchair-play-tennis-royalty-free-illustration/583809218?adppopup=true [Accessed 6 June 2025]. Source adapted.

20. Abul Basar. *Long jump silhouette*. [image online] Available at: https://www.vecteezy.com/vector-art/51440815-long-jump-set-of-silhouettes-of-the-triple-jump-long-jump-different-isolated-on-a-white-background-vectors-illustration [Accessed 13 May 2026]. Source adapted.

21. Abul Basar. *Long jump silhouette*. [image online] Available at: https://www.vecteezy.com/vector-art/51440815-long-jump-set-of-silhouettes-of-the-triple-jump-long-jump-different-isolated-on-a-white-background-vectors-illustration [Accessed 13 May 2026]. Source adapted.