

**Sports, exercise and health science**  
**Standard level**  
**Paper 1**

Tuesday 30 October 2018 (afternoon)

45 minutes

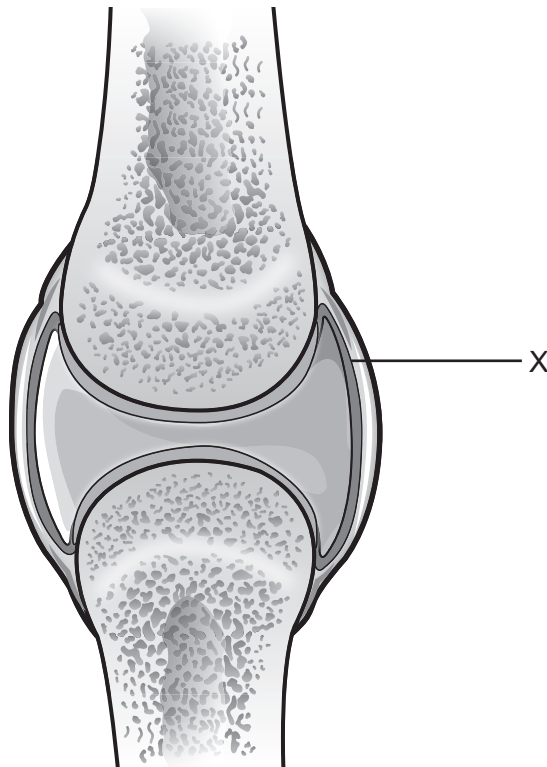
---

**Instructions to candidates**

- 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.
- The maximum mark for this examination paper is **[30 marks]**.

1. What is the position of the scapula relative to the rib cage?
  - A. Medial
  - B. Inferior
  - C. Posterior
  - D. Proximal

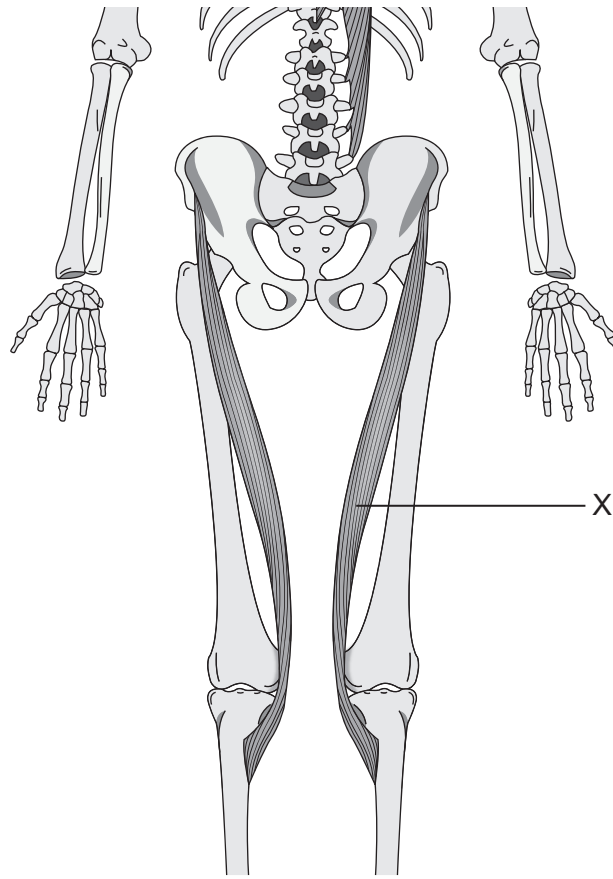
2. What structure is labelled X in the diagram below?



[Source: adapted from OpenStax, Anatomy & Physiology, 9.4 Synovial Joints, Figure 1, by Rice University, Feb 26, 2016, <https://cnx.org/contents/FPtK1z mh@12.7:bFtYymxt@7/Synovial-Joints>. Licensed under a Creative Commons Attribution 4.0 International License, <https://creativecommons.org/licenses/by/4.0.>]

- A. Articular capsule
- B. Synovial fluid
- C. Articular cartilage
- D. Synovial membrane

3. What muscle is labelled X in the diagram below?



[Source: adapted from [https://commons.wikimedia.org/wiki/File:Sartorius\\_3D.gif](https://commons.wikimedia.org/wiki/File:Sartorius_3D.gif), BodyParts3D, © The Database Center for Life Science licensed under CC Attribution-Share Alike 2.1 Japan.]

- A. Iliopsoas
  - B. Sartorius
  - C. Vastus lateralis
  - D. Vastus intermedius
4. Which is a principal structure of the ventilatory system?
- A. Capillary
  - B. Bronchiole
  - C. Hemoglobin
  - D. Pulmonary artery

5. What is residual volume?
- A. Volume of air in the lungs after maximum inhalation
  - B. Inflow and outflow of air between the atmosphere and the lungs
  - C. Volume of air still contained in the lungs after maximal exhalation
  - D. Additional inspired air over and above tidal volume
6. What is the action of the diaphragm and the external intercostal muscles during exhalation?

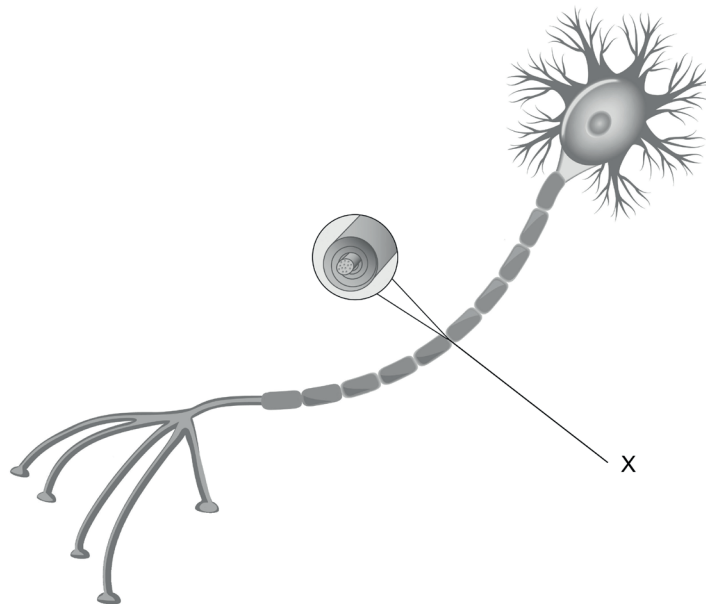
	<b>Diaphragm</b>	<b>External intercostal muscle</b>
A.	Relaxation	Relaxation
B.	Contraction	Contraction
C.	Relaxation	Contraction
D.	Contraction	Relaxation

7. What is the equation for cardiac output?
- A. Heart rate  $\div$  stroke volume
  - B. Tidal volume  $\times$  frequency
  - C. Heart rate  $\div$  tidal volume
  - D. Stroke volume  $\times$  heart rate
8. Which demonstrates how blood is redistributed to the working muscles during exercise?

	<b>Pre-capillary sphincters of the working muscles</b>	<b>Arterioles of the working muscles</b>
A.	Constrict	Dilate
B.	Dilate	Constrict
C.	Dilate	Dilate
D.	Constrict	Constrict

9. Which defines maximal oxygen consumption?
- A. Maximum volume of oxygen inhaled and used per minute
  - B. Maximum volume of air exhaled after a maximum inhalation
  - C. Maximum volume of oxygenated blood ejected per minute
  - D. Maximum volume of oxygen breathed in or out per breath
10. Which is a function of protein?
- A. Primary source of energy
  - B. Provide insulation under the skin
  - C. Protect vital organs from impact
  - D. Provide structure to build tissues
11. Which describes non-essential amino acids?
- A. They are broken down by digestion into fatty acids.
  - B. They can be synthesised by the human body.
  - C. They must be obtained from the diet.
  - D. They do not have nitrogen in their composition.
12. Which is the breakdown of glycogen into glucose?
- A. Glycolysis
  - B. Glycogenesis
  - C. Glycogenolysis
  - D. Beta oxidation

13. What is the function of glucagon during fasting?
- A. Stimulate the breakdown of glycogen into glucose
  - B. Stimulate the uptake of glucose to form glycogen
  - C. Stimulate the uptake of glycogen to form glucose
  - D. Stimulate the production of adipose tissue from glucose
14. What is the net amount of ATP molecules produced from one glucose molecule in the lactic acid system?
- A. 36
  - B. 4
  - C. 2
  - D. 1
15. What is the structure labelled X in the diagram below?



[Source: Designua/Shutterstock]

- A. Axon
- B. Muscle
- C. Dendrite
- D. Cell body

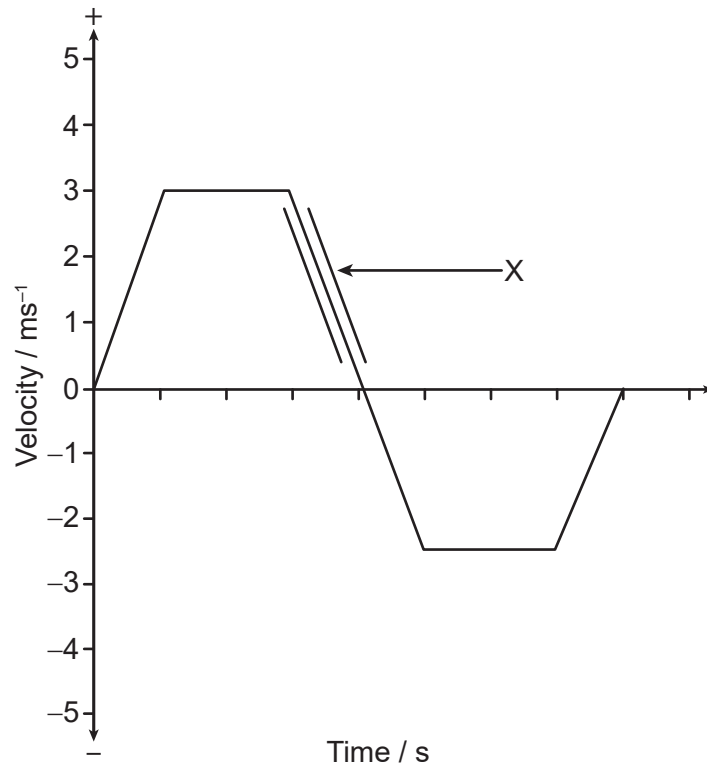
16. Which movement is performed at the ankle joint in the diagram below?



[Source: adapted from <https://pixabay.com>]

- A. Eversion
  - B. Inversion
  - C. Dorsi flexion
  - D. Plantar flexion
17. Which muscle contraction occurs when the muscle lengthens under tension?
- A. Isokinetic
  - B. Isometric
  - C. Eccentric
  - D. Concentric

18. What describes acceleration and the direction of travel during X on the graph below?



[Source: © International Baccalaureate Organization 2018]

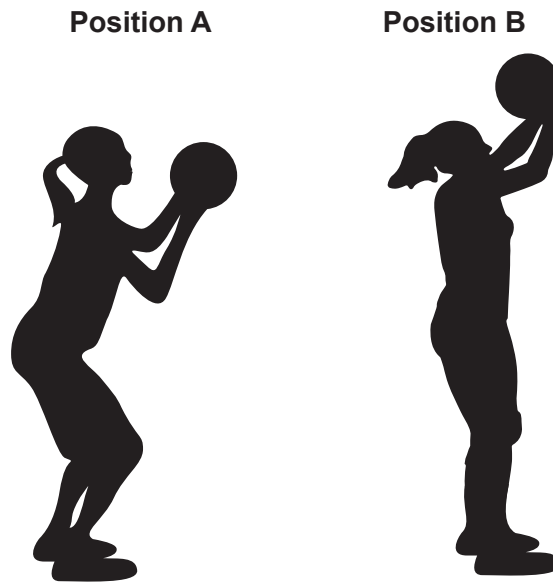
	<b>Acceleration</b>	<b>Direction of travel</b>
A.	Positive	Forwards
B.	Positive	Backwards
C.	Negative	Forwards
D.	Negative	Backwards

19. What is the relationship between angular momentum, angular velocity and moment of inertia?

- A. Moment of inertia = angular velocity  $\times$  angular momentum
- B. Angular momentum = angular velocity  $\div$  moment of inertia
- C. Angular velocity = moment of inertia  $\div$  angular momentum
- D. Angular momentum = angular velocity  $\times$  moment of inertia



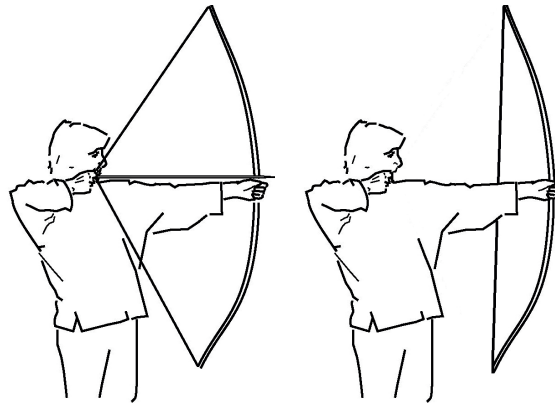
20. What happens to the centre of mass when the basketball player prepares to shoot, moving from position A to position B?



[Source: adapted from sdart/iStock]

- A. Does not move
  - B. Moves upwards
  - C. Moves downwards
  - D. Moves forwards
21. What type of skill is used to decide and perform a pass in soccer?
- A. Cognitive skill
  - B. Perceptual skill
  - C. Motor skill
  - D. Perceptual motor skill

22. Which classifies the release of an arrow in archery?



[Source: adapted from "A woman shooting a bow and arrow," by Benjamin Crowell, [https://en.wikipedia.org/wiki/File:A\\_woman\\_shooting\\_a\\_bow\\_and\\_arrow.jpg](https://en.wikipedia.org/wiki/File:A_woman_shooting_a_bow_and_arrow.jpg). Licensed under a Creative Commons Attribution-ShareAlike 3.0 Unported license. <https://creativecommons.org/licenses/by-sa/3.0/>.]

- A. Fine–closed–continuous
  - B. Fine–individual–discrete
  - C. Gross–closed–discrete
  - D. Gross–individual–continuous
23. What is a characteristic of short-term sensory store?
- A. It contains motor programmes
  - B. It can convert information into a knowledge structure
  - C. It has a high capacity for storing information
  - D. It is a relatively permanent area for storing information
24. Which defines response time?
- A. Time from the introduction of a stimulus to completion of an action
  - B. Time from the onset of a stimulus to the beginning of an action
  - C. Time taken to carry out motor aspects of a performance
  - D. Time between the introduction of first and second stimuli

25. Which describes the associative stage of learning?
- A. Performers' movements are regularly practised and refined.
  - B. Performers consistently complete actions with fluency.
  - C. Performers' movements are erratic and lack fluency.
  - D. Performers regularly focus on irrelevant stimuli for movements that require perception.
26. What type of transfer occurs from a 3 versus 3 training game to a 5 versus 5 competitive basketball game?
- A. Skill to skill
  - B. Abilities to skill
  - C. Practice to performance
  - D. Stage to stage
27. What can be represented by error bars on a graph?
- A. Ratio of the standard deviation to the mean value of a set of data
  - B. Variability of a set of data from the median
  - C. Variability of the mode value of a set of data
  - D. Variability of a set of data from the mean
28. Which is a component of performance-related (skill-related) fitness?
- A. Muscular endurance
  - B. Body composition
  - C. Power
  - D. Strength

- 29.** Which test measures muscular strength?
- A. Maximum sit-ups
  - B. Hand grip dynamometer
  - C. Maximum press-ups
  - D. Vertical jump
- 30.** Which outlines progression as a principle of training programme design?
- A. Training muscles that are relevant to the actions of the sport
  - B. Training is high intensity for short bursts
  - C. Training by gradual increase in physical challenge to induce adaptations
  - D. Training with a range of methods to maintain motivation
-