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Sports, exercise and health science
Standard level
Paper 1

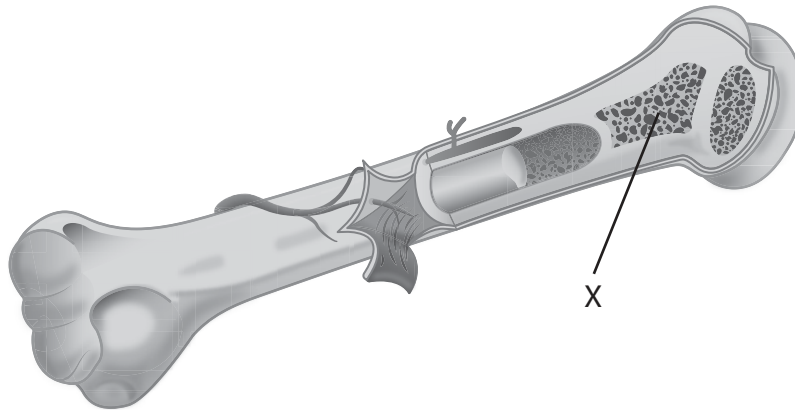
Tuesday 5 November 2019 (afternoon)

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]**.

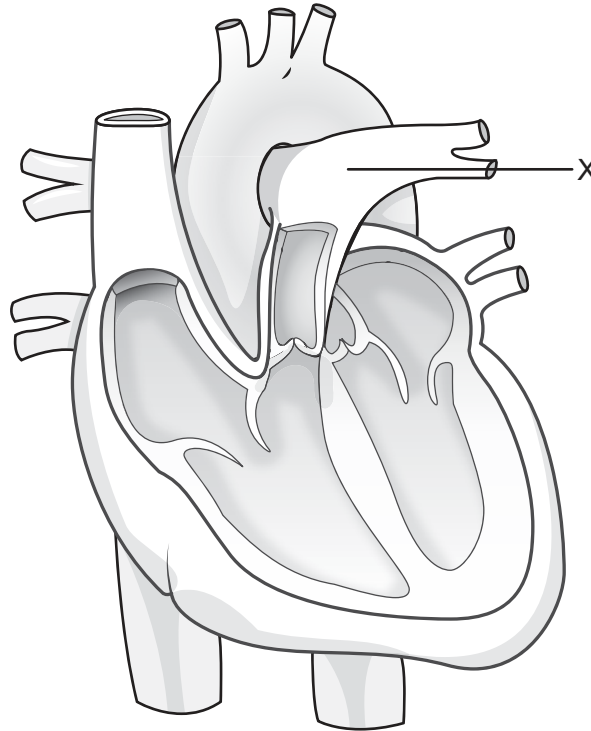
1. The diagram below shows a long bone. What is the structure labelled X?



[Source: reprinted from *The Lancet, Diabetes & Endocrinology*, Vol. 2, no 5, M.G. Vervloet *et al.*, Bone: a new endocrine organ at the heart of chronic kidney disease and mineral and bone disorders, Pages 427–436, Copyright 2014, with permission from Elsevier. <https://www.thelancet.com/journals/landia/home>]

- A. Compact bone
 - B. Spongy bone
 - C. Diaphysis
 - D. Cartilage
2. Using anatomical terminology, what is the position of the sacral bones relative to the lumbar bones?
- A. Inferior
 - B. Lateral superior
 - C. Medial
 - D. Superior
3. Which types of muscles are only under involuntary control?
- I. Smooth muscle
 - II. Cardiac muscle
 - III. Skeletal muscle
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

4. Which term is defined as the volume of air breathed in and out in one breath?
- A. Pulmonary ventilation
 - B. Tidal volume
 - C. Vital capacity
 - D. Residual volume
5. The diagram shows an anterior view of the heart. Which blood vessel is labelled X?



[Source: adapted from Heart diagram with labels in, ZooFari, https://en.wikipedia.org/wiki/Cardiology#/media/File:Heart_diagram_blood_flow_en.svg, licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license, <https://creativecommons.org/licenses/by-sa/3.0/legalcode>]

- A. Aorta
 - B. Pulmonary artery
 - C. Pulmonary vein
 - D. Vena cava
6. What describes the sequence of excitation of the heart muscle?
- A. Sinoatrial node → atrioventricular node → ventricles
 - B. Atrioventricular node → ventricles → sinoatrial node
 - C. Ventricles → atrioventricular node → sinoatrial node
 - D. Sinoatrial node → ventricles → atrioventricular node

Turn over

7. What describes the effect of exercise on cardiac output?

	Stroke volume	Heart rate
A.	Increases	Increases
B.	Increases	Decreases
C.	Decreases	Increases
D.	Decreases	Decreases

8. Where does blood exert the force measured as systolic blood pressure?

- A. On the arterial walls during ventricular relaxation
- B. On the venous walls during ventricular contraction
- C. On the arterial walls during ventricular contraction
- D. On the venous walls during ventricular relaxation

9. How does blood pressure respond during a warm-up?

	Systolic blood pressure	Diastolic blood pressure
A.	Increases	Increases
B.	Remains constant	Remains constant
C.	Remains constant	Increases
D.	Increases	Remains constant

10. Which element distinguishes an amino acid from a fatty acid?

- A. Carbon
- B. Hydrogen
- C. Oxygen
- D. Nitrogen

11. The diagram shows the nutritional information from an energy gel packet. Which nutrient provides the **most** energy per serving?

Nutrition Facts	
Serving size 1 packet (30g)	
Servings per container 1	
Amount per serving	
Total fat	10g
Total carbohydrate	10g
Protein	10g

[Source: © International Baccalaureate Organization 2019]

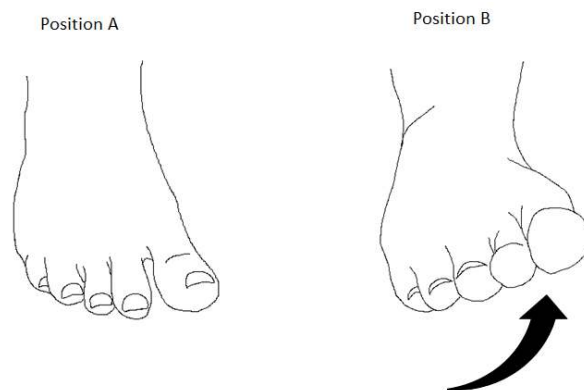
- A. Total fat
 - B. Total carbohydrate
 - C. Protein
 - D. The nutrients provide equal amounts of energy
12. Which is a major storage site for glycogen?
- A. Pancreas
 - B. Brain
 - C. Liver
 - D. Kidney
13. Which outlines lipolysis?
- A. Two glucose molecules combine to form a disaccharide
 - B. One glycerol and three fatty acids combine to form a triglyceride
 - C. One disaccharide breaks down to form two glucose molecules
 - D. One triglyceride breaks down to form glycerol and three fatty acids

Turn over

- 14. What are the products of anaerobic glycolysis?
 - A. 2 ATP per glucose molecule and lactic acid
 - B. 2 ATP per glucose molecule and no lactic acid
 - C. 34–36 ATP per glucose molecule and no lactic acid
 - D. 34–36 ATP per glucose molecule and lactic acid

- 15. What describes the role of acetylcholine in skeletal muscle contraction?
 - A. To open an axon’s synaptic vesicle
 - B. To close an axon’s synaptic vesicle
 - C. To open a motor-end plate channel
 - D. To block a motor-end plate channel

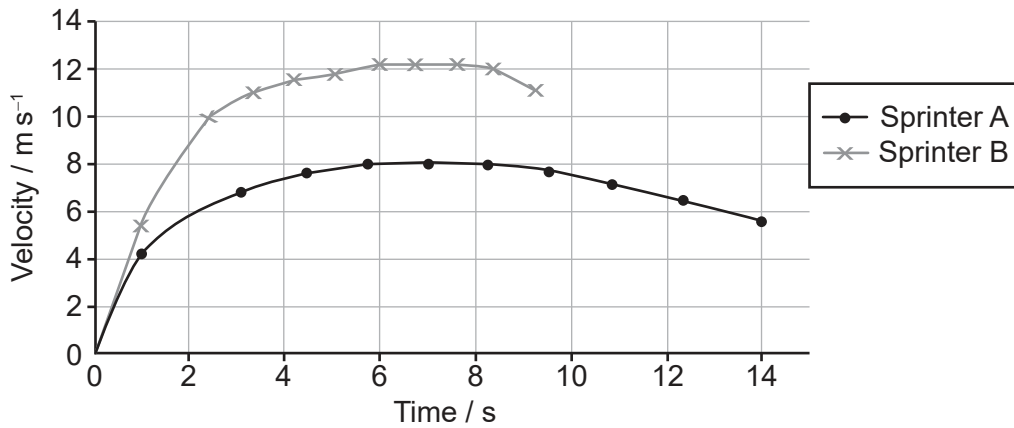
- 16. The diagram shows a right foot. Which type of movement happens from Position A to Position B?



[Source: used with permission]

- A. Dorsi flexion
- B. Plantar extension
- C. Eversion
- D. Inversion

17. The velocity–time graph below shows the performance of two sprinters. Which statement describes the sprinters **at 1 second**?

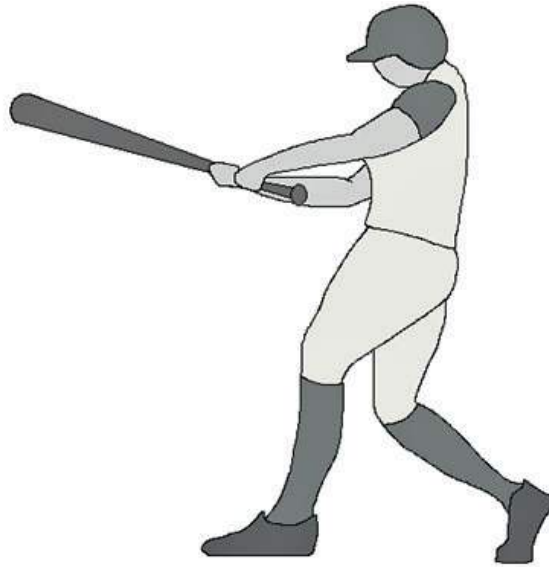


[Source: adapted from www.liacoseducationalmedia.com]

- A. Sprinter A is moving faster than Sprinter B at 1 second.
 - B. Sprinter B is moving faster than Sprinter A at 1 second.
 - C. Sprinter A and Sprinter B are moving at the same velocity at 1 second.
 - D. Sprinter A and Sprinter B are not moving at 1 second.
18. Which levers have the effort and the load on the same side of the fulcrum?
- I. First class lever
 - II. Second class lever
 - III. Third class lever
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

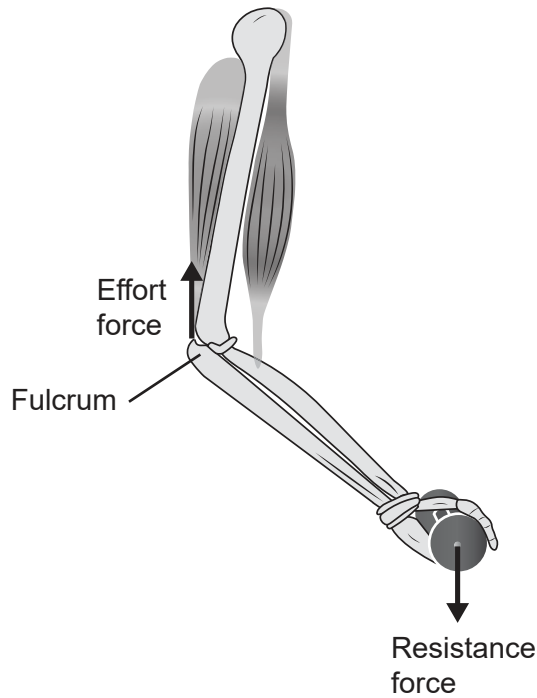
Turn over

19. Which illustrates Newton's second law of motion during a baseball game?



- A. The ball changes direction when hit by the bat due to an unbalanced outside force.
- B. The ball exerts a force on the bat when hit in the opposite direction.
- C. The distance the ball travels depends on the angle at which it is hit by the bat.
- D. The ball accelerates from the bat in proportion to the velocity of the bat swing.

20. The diagram shows elbow extension. Which type of lever is used?

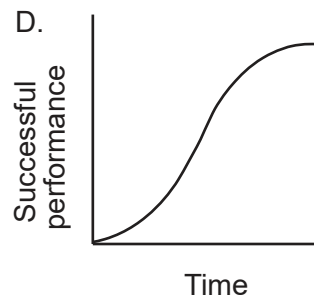
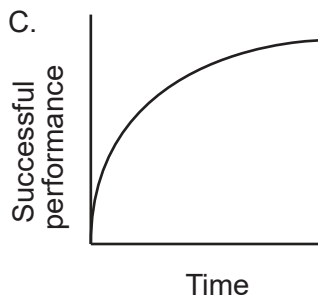
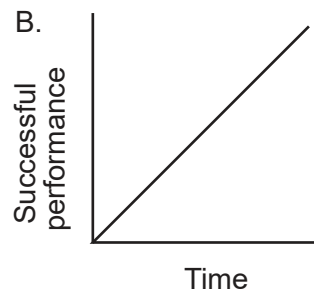
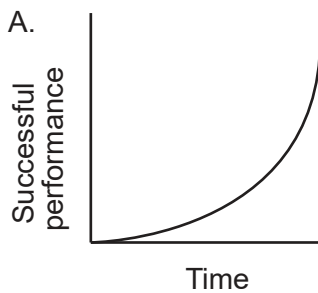


[Source: © International Baccalaureate Organization 2019]

- A. First
 - B. Second
 - C. Third
 - D. No lever is used during elbow extension
21. Which skill profile outlines the motor skills involved in a tennis rally?
- A. Discrete and open
 - B. Serial and open
 - C. Continuous and closed
 - D. Serial and closed
22. Which term is defined as a capacity of the individual that is related to the performance potential of a variety of tasks?
- A. Skill
 - B. Ability
 - C. Technique
 - D. Learning

Turn over

23. Which statement characterizes Hick's Law?
- A. As the number of stimuli increases, the reaction time increases.
 - B. The response time increases as stimuli are presented in close succession.
 - C. Reaction time decreases as the number of stimuli presented increases.
 - D. The time it takes to respond includes the reaction to stimulus and the movement.
24. What is the role of selective attention?
- A. To filter relevant information from noise
 - B. To hold all information for seconds
 - C. To store relevant information for years
 - D. To pass all information to the long-term memory
25. Which graph shows a negatively accelerated learning curve?



[Source: copyright International Baccalaureate Organization, 2019]

- 26. Which type of presentation involves the repetitive practice of a single part of a skill?
 - A. Whole
 - B. Whole-part-whole
 - C. Progressive part
 - D. Part

- 27. What describes the difference between the two sets of group data in the table?

	Group 1 data	Group 2 data
Mean	385	402
SD	34.33	25.70
<i>p</i>	0.32	

[Source: copyright International Baccalaureate Organization, 2019]

	Percent probability that the difference is due to chance	Difference is statistically significant
A.	0.32%	Yes
B.	0.32%	No
C.	32%	Yes
D.	32%	No

- 28. What makes a fitness test reliable?
 - A. It is repeatable.
 - B. It is relevant to a given sport.
 - C. It is inconsistent.
 - D. It measures the factors that it is designed to measure.

- 29. Which fitness test provides an assessment of muscle endurance?
 - A. Hand grip dynamometer
 - B. Maximum push-ups
 - C. Harvard step test
 - D. Standing broad jump

Turn over

30. An athlete is engaged in consistent regular training. Which key principle is being met?
- A. Overload
 - B. Specificity
 - C. Reversibility
 - D. Variety
-