

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

Tuesday 31 October 2017 (afternoon)

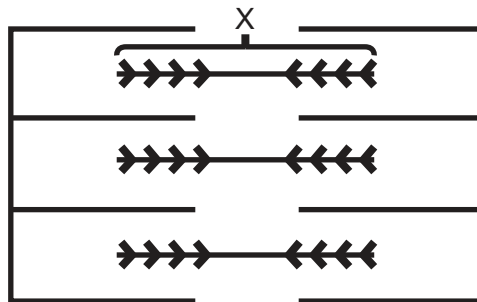
45 minutes

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**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. Which are types of synovial joints?
  - A. Condylloid, saddle, gliding
  - B. Immovable, slightly movable, ball and socket
  - C. Intervertebral joints, pubic symphyses, gliding
  - D. Fibrous, cartilaginous, condyloid
  
2. Which is the most lateral in the anatomical position?
  - A. Sternum
  - B. Ulna
  - C. Radius
  - D. Skull
  
3. What is the structure labelled X on the sarcomere in the diagram below?



[Source: © International Baccalaureate Organization 2017]

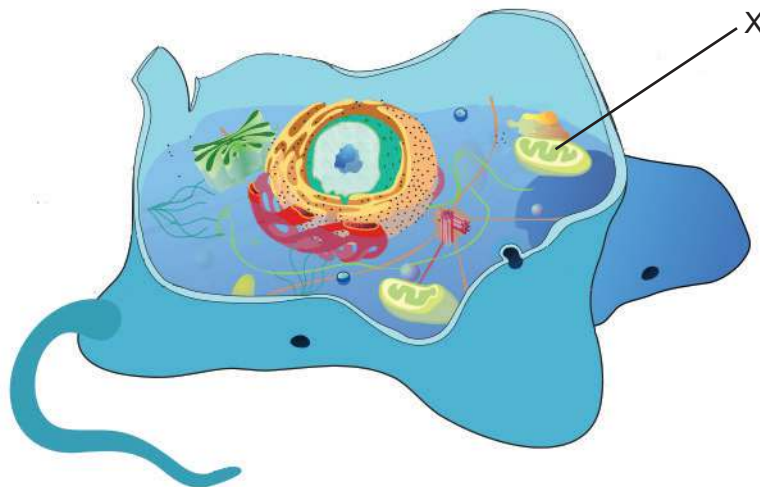
- A. Z line
  - B. Myofibril
  - C. Myosin filament
  - D. Actin filament
  
4. What is pulmonary ventilation?
  - A. Exchange of respiratory gases between the lungs and blood
  - B. Diffusion of oxygen in the alveoli
  - C. Volume of air breathed in and out in one breath
  - D. Inflow and outflow of air between the atmosphere and the lungs

5. Which are involved in neural control of ventilation?
- A. Sinoatrial and atrioventricular nodes
  - B. Lung stretch receptors and chemoreceptors
  - C. Adrenaline and breathing rate
  - D. Diaphragm and accessory muscles
6. Where is hemoglobin located?
- A. In white blood cells
  - B. In platelets
  - C. In muscle cells
  - D. In red blood cells
7. How do the concentrations of oxygen and carbon dioxide in the pulmonary vein differ from the concentrations in the pulmonary artery?
- A. Pulmonary vein has lower oxygen and higher carbon dioxide
  - B. Pulmonary vein has lower oxygen and lower carbon dioxide
  - C. Pulmonary vein has higher oxygen and lower carbon dioxide
  - D. Pulmonary vein has higher oxygen and higher carbon dioxide

**Turn over**

8. Which are involved in the regulation of heart rate?
- I. Sinoatrial node
  - II. Autonomic nervous system
  - III. Adrenaline
- A. I and II only
  - B. I and III only
  - C. II and III only
  - D. I, II and III
9. 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
10. Which are micronutrients?
- A. Water, lipids, proteins
  - B. Fibre, vitamins, minerals
  - C. Carbohydrates, fibre, proteins
  - D. Vitamins, minerals, water
11. What is the composition of the triacylglycerol molecule?
- A. Three glycerol molecules and one fatty acid
  - B. Three glycerol molecules and three fatty acids
  - C. One glycerol molecule and two fatty acids
  - D. One glycerol molecule and three fatty acids

12. What characterizes saturated fats?
- A. They contain one or more double bonds between carbon atoms within the fatty acid.
  - B. They originate from plant-based foods such as avocado and cashew nuts.
  - C. They have no double bonds between the individual carbon atoms of the fatty acid.
  - D. They are often found as liquids at room temperature.
13. What is glycogen?
- A. A disaccharide built from glucose molecules
  - B. A polysaccharide built from glucose molecules
  - C. A form of glucagon
  - D. A storage molecule for proteins
14. The diagram below shows the ultrastructure of an animal cell. What is the structure labelled X?



[Source: [https://en.wikipedia.org/wiki/Eukaryote#/media/File:Animal\\_cell\\_structure\\_en.svg](https://en.wikipedia.org/wiki/Eukaryote#/media/File:Animal_cell_structure_en.svg), by Mariana Ruiz]

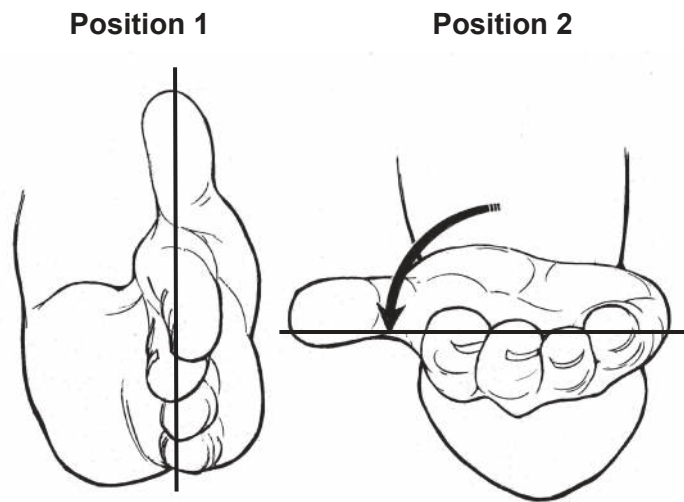
- A. Nucleus
- B. Mitochondrion
- C. Lysosome
- D. Golgi apparatus

Turn over

15. Which is the correct sequence of neural impulse transmission to the muscle?

- A. cell body → dendrite → axon → motor end plate
- B. motor end plate → dendrite → axon → cell body
- C. dendrite → axon → cell body → motor end plate
- D. dendrite → cell body → axon → motor end plate

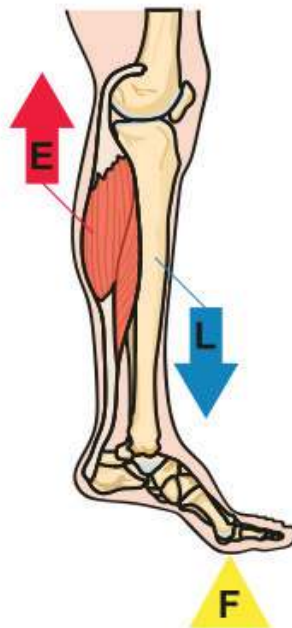
16. What type of movement takes place from Position 1 to Position 2 in the diagram below?



[Source: © LifeART www.fotosearch.com]

- A. Eversion
  - B. Pronation
  - C. Supination
  - D. Rotation
17. What is the muscle contraction where length of the muscle remains the same?
- A. Isotonic concentric
  - B. Isotonic eccentric
  - C. Isometric
  - D. Isokinetic

18. Which is the equation for force?
- A. Force = mass  $\times$  acceleration
  - B. Force = displacement  $\div$  time
  - C. Force = velocity  $\div$  time
  - D. Force = velocity  $\times$  mass
19. What is the centre of mass of a body?
- A. The geometric centre of the body
  - B. The average weight between the appendicular and axial skeletons
  - C. The point equidistant between the navel and the third lumbar vertebrae
  - D. The point at which the mass and weight of a body/object are balanced in all directions
20. Which type of lever is used in plantar flexion?



[Source: Udaix/Shutterstock]

- A. First
- B. Second
- C. Third
- D. No lever is used in plantar flexion

Turn over

21. Which describes skill in sport?
- A. Selection of an appropriate technique
  - B. Inherent characteristics that allow for effective learning
  - C. Consistent production of goal-oriented movements
  - D. The ability to perform well in a sport
22. What is the definition of *technique* in sport?
- A. Growth oriented practice
  - B. Ability to mimic professional athletes
  - C. Efficient information processing
  - D. The way of doing or performing
23. What is the relationship between skill, technique and ability?
- A. Ability = skill × technique
  - B. Skill = ability + technique
  - C. Technique = skill × ability
  - D. Ability = skill + technique
24. Which characteristic describes short-term memory?
- A. Information that is readily available for a short period
  - B. Capacity for large amounts of information
  - C. Information that is selected for future reference
  - D. Most of the information is lost in less than one second
25. When is whole–part–whole presentation used in learning?
- A. When a skill is simple
  - B. When a skill is part of a specific sequence
  - C. When there is an element of danger
  - D. When technical weaknesses can be isolated



26. What do small standard deviation error bars show?

	Reliability of data	Variability of data
A.	low	high
B.	high	high
C.	high	low
D.	low	low

27. What percentage of the normal distribution lies within  $\pm 1$  standard deviation of the mean?

- A. 98 %
- B. 65 %
- C. 95 %
- D. 68 %

28. Which is the equation for coefficient of variation?

- A. Coefficient of variation = standard deviation – mean
- B. Coefficient of variation = standard deviation  $\div$  mean  $\times$  100 %
- C. Coefficient of variation = mean – standard deviation
- D. Coefficient of variation = mean  $\div$  standard deviation  $\times$  100 %

29. Which fitness component can be assessed by anthropometry?

- A. Flexibility
- B. Body composition
- C. Strength
- D. Aerobic capacity

Turn over

30. What are essential elements of a general training programme?
- A. Warm-up, stretching activities, endurance training
  - B. Resistance training, physical fitness, selection of task
  - C. Overload, specificity, periodization
  - D. Cognitive, associative, autonomous learning
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