

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

Friday 6 May 2016 (morning)

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. What type of joint is the ankle?
  - A. Saddle joint
  - B. Pivot joint
  - C. Hinge joint
  - D. Gliding joint
  
2. Which of the following bones has the movement of the body as its main function?
  - A. Fibula
  - B. Skull
  - C. Coccyx
  - D. Sternum
  
3. What is the main function of the knee joint ligament?
  - A. To secrete synovial fluid
  - B. To absorb shock
  - C. To help with joint stability
  - D. To provide a friction-free environment

4. Which component of the muscle is labelled X below?



- A. Perimysium
  - B. Myofibril
  - C. Sarcomere
  - D. Muscle fibre
5. Which of the following applies to hemoglobin?
- A. It binds strongly to oxygen when there is a low partial pressure
  - B. It is an iron compound
  - C. It transports approximately 80 % of oxygen in the blood
  - D. It is a component of white blood cells
6. Which of the following is the correct order for carbon dioxide moving from the pulmonary artery to the atmosphere?
- A. trachea → larynx → nose
  - B. alveoli → trachea → bronchi
  - C. bronchi → trachea → bronchioles
  - D. nose → trachea → bronchi

**Turn over**

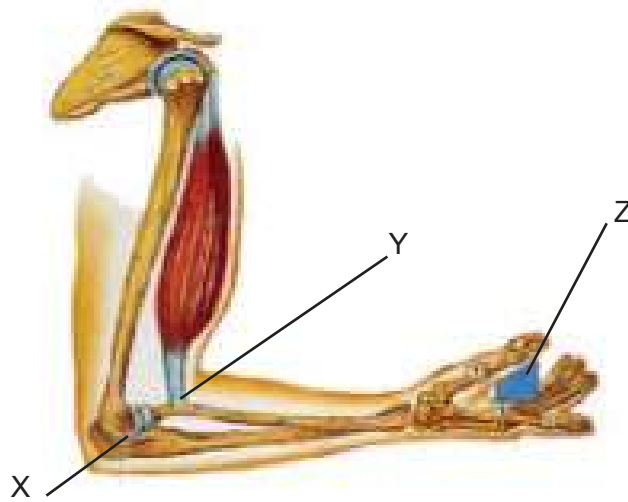
7. What does the elevated breathing rate after exercise allow the body to do?
- A. To stimulate the peripheral chemoreceptors
  - B. To increase the pH of the blood
  - C. To trigger the Hering-Breuer reflex
  - D. To stimulate muscle proprioceptors
8. Which of the following are correct statements about the pulmonary and systemic circulatory systems?
- I. Pulmonary circulation is driven from the right ventricle to drop off carbon dioxide at the lungs.
  - II. Systemic circulation brings back oxygen from the lungs for the rest of the body.
  - III. The vena cava is involved with the systemic circulatory system.
  - IV. Pulmonary circulation has lower blood pressure than the systemic system.
- A. I only
  - B. II and III only
  - C. I, III and IV only
  - D. I, II, III and IV
9. Which of the following is correct for an athlete who is exercising at a steady pace on flat terrain for a prolonged period of time?
- A. Stroke volume gradually decreases and submaximal heart rate gradually increases
  - B. Cardiac output gradually decreases as they get used to the exercise load
  - C. Stroke volume and submaximal heart rate gradually decrease
  - D. Stroke volume and submaximal heart rate gradually increase
10. Which of the following correctly describes the sequence of excitation of heart muscle?
- A. AV node → bundle of HIS → SA node
  - B. SA node → AV node → bundle of HIS
  - C. bundle of HIS → SA node → AV node
  - D. AV node → SA node → bundle of HIS

11. What is the chemical composition of a glucose molecule?
- A.  $\text{CH}_3$  and  $\text{COOH}$
  - B. C, H and O
  - C. C, H, O and N
  - D. C, H and OH
12. Which of the following describes lipolysis?
- A. The process of releasing triglycerides from the body's fat stores
  - B. The process of converting glucose to pyruvate
  - C. The aerobic anabolism of a substance
  - D. The process of converting carbohydrates to fats in the liver
13. What is the function of adrenaline during exercise?
- A. Stimulates the storage of glycogen
  - B. Stimulates the breakdown of glycogen
  - C. Stimulates the breakdown of glucagon
  - D. Stimulates the storage of glucagon
14. Which of the following is the function of the Golgi apparatus?
- A. It is involved in the processing and packaging of proteins and fats
  - B. It is involved in organising the cell during cell division
  - C. It is involved in the anaerobic production of ATP
  - D. It assists in the breakdown of food particles

Turn over

15. Which of the following are features of the ATP-CP system?
- I. It provides the energy for the first three minutes of activity.
  - II. CP is broken down to provide a phosphate molecule.
  - III. It creates lactic acid as a by-product.
- A. I only  
B. II only  
C. I and II only  
D. II and III only

16. Which of the labels for the lever system are correct?



[Source: © International Baccalaureate Organization 2016]

	Effort	Fulcrum	Load
A.	Y	Z	X
B.	Z	X	Y
C.	X	Y	Z
D.	Y	X	Z

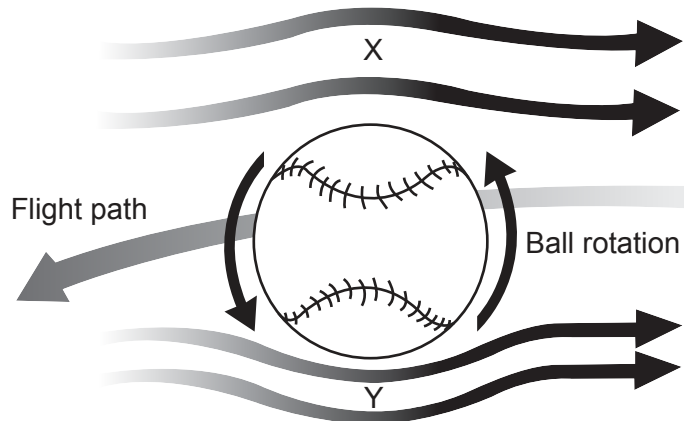
17. Which of the following defines *momentum*?

- A. force  $\times$  time
- B. velocity  $\times$  time
- C. mass  $\times$  velocity
- D. mass  $\times$  distance

18. Which of the following describes Newton's second law of motion?

- A. The rate of change of momentum of a body is proportional to the force causing it.
- B. To bring about motion a force must be applied.
- C. When one body applies a force to another the second body will apply an equal and opposite force back.
- D. The effect of a constant force on a mass will always be the same.

19. Which of the following correctly labels the components of the Bernoulli principle?

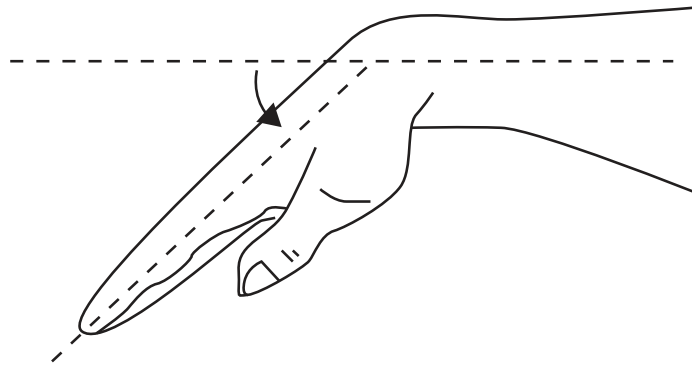


[Source: adapted from <https://encrypted-tbn2.gstatic.com>]

- A. Y has higher relative air velocity and X has lower relative air pressure
- B. Y is a region of lower relative air velocity and lower relative air pressure
- C. X has lower relative air velocity and Y has higher relative air pressure
- D. X is a region of lower relative air velocity and higher relative air pressure

Turn over

20. What is the type of movement occurring at the wrist in the diagram below?



[Source: © International Baccalaureate Organization 2016]

- A. Flexion
  - B. Extension
  - C. Pronation
  - D. Supination
21. Which of the following is correct?
- A. Ability = skill + selection of an appropriate technique
  - B. Skill = ability + selection of an appropriate technique
  - C. Technique = ability + skill
  - D. Skill = reaction time + movement time
22. What describes a model of information processing?
- A. processing and decision making → input → output
  - B. input → processing and decision making → output
  - C. feedback → output → processing and decision making
  - D. processing and decision making → feedback → output



23. Which of the following describes intrinsic feedback?
- A. Post-response information concerning the outcome of an action
  - B. An awareness of the body's position from sensors in the muscles and tendons
  - C. Information about the execution of a performance from video
  - D. Information received from the coach during an activity
24. Which of the following are roles of feedback?
- I. To improve motivation to perform
  - II. To cause a positive acceleration in learning
  - III. To provide information about an opponent's strengths and weaknesses
- A. I only
  - B. II only
  - C. I and II only
  - D. I, II and III
25. What factors contribute to reaction time?
- A. Stimulus transmission and nerve transmission
  - B. Signal detection and muscle movement time
  - C. Nerve transmission and intrinsic feedback
  - D. Initiation of an action and extrinsic feedback
26. Which of the following statements are correct for memory?
- A. Short term memory will hold information for less than one second and the information will be lost if it is not attended to.
  - B. Long term memory has a capacity of  $7 \pm 2$  bits and the movement of information to this stage relies on rehearsal.
  - C. The short term sensory store has a large capacity but any signal is lost very quickly.
  - D. Short term memory has a larger capacity than both the short term sensory store and long term memory.

Turn over

- 27.** What does standard deviation represent?
- A. The ratio of the correlation to the mean
  - B. A causal relationship between two variables
  - C. The correlation between two variables
  - D. It summarises the spread of values around the mean
- 28.** Which is correct with regard to study design?
- A. Validity is when you retest in similar conditions and achieve consistent results.
  - B. A power athlete performing a vertical jump test with their eyes closed is an example of using a blind study.
  - C. Reliability is when you undertake a test and it measures what you want.
  - D. An endurance athlete doing the Cooper's 12 Minute Run to test aerobic power demonstrates specificity.
- 29.** What describes the force that a muscle or group of muscles can exert in a single contraction?
- A. Muscular strength
  - B. Aerobic capacity
  - C. Speed
  - D. Muscular power
- 30.** What test is valid for measuring muscular endurance?
- A. Sit and reach
  - B. Stork stand
  - C. Hand grip dynamometer
  - D. Flexed arm hang
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