

Sports, exercise and health science
Higher level
Paper 1

Thursday 10 May 2018 (afternoon)

1 hour

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 **[40 marks]**.

1. The diagram shows a hand. What type of joint is labelled X?



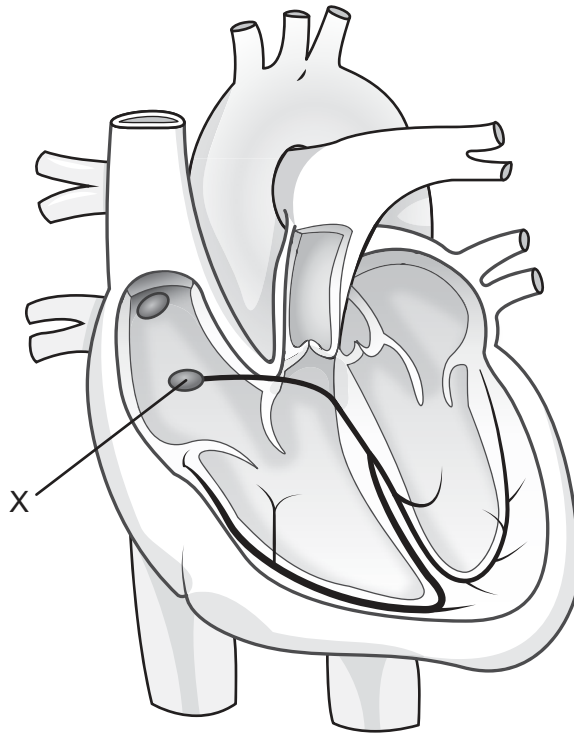
[Source: © International Baccalaureate Organization 2018]

- A. Hinge
 - B. Saddle
 - C. Condylloid
 - D. Pivot
2. Which statement about a skeleton is correct?
- A. The axial skeleton's prime function is movement.
 - B. The ribs are a part of the axial skeleton.
 - C. The appendicular skeleton's prime function is support.
 - D. The skull is a part of the appendicular skeleton.
3. Which structure is responsible for moistening air entering the ventilatory system?
- A. Bronchi
 - B. Larynx
 - C. Pharynx
 - D. Nose

4. What does diastolic blood pressure measure?
- A. The force exerted by blood on arterial walls during atrial contraction
 - B. The force exerted by blood on arterial walls during atrial relaxation
 - C. The force exerted by blood on arterial walls during ventricular contraction
 - D. The force exerted by blood on arterial walls during ventricular relaxation
5. Which phrase describes residual volume?
- A. Additional inspired air over and above vital capacity
 - B. Volume of air in the lungs after a maximal exhalation
 - C. Additional inspired air over and above tidal volume
 - D. Volume of air in the lungs after a maximal inhalation
6. Which heart valve separates the right ventricle from the right atrium?
- A. Aortic
 - B. Tricuspid
 - C. Bicuspid
 - D. Pulmonary

Turn over

7. The diagram shows the heart. What is the specialized tissue labelled X?



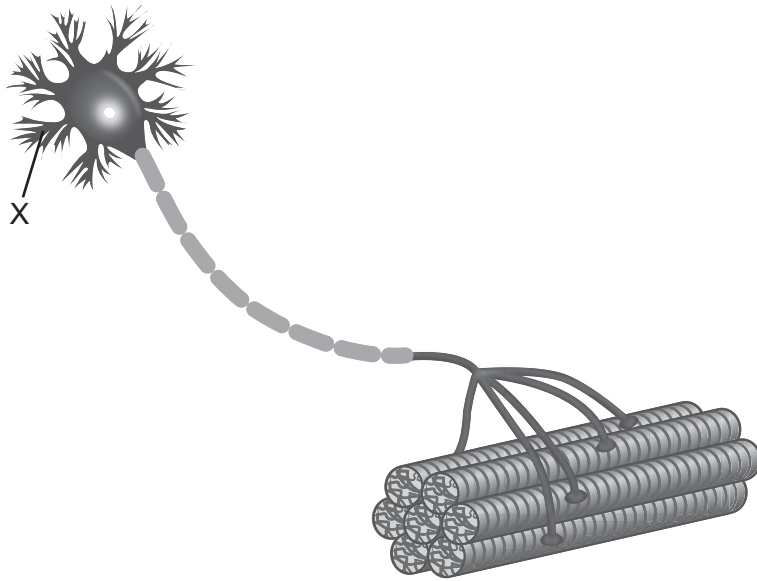
[Source: © Legger | Dreamstime.com]

- A. Sinoatrial node
 - B. Atrioventricular node
 - C. Right ventricle
 - D. Atrioventricular bundle
8. What is the ratio of C to H to O in a glucose molecule?
- A. 1:3:1
 - B. 1:2:1
 - C. 1:3:2
 - D. 1:2:2

9. What is aerobic catabolism?
- A. A chemical reaction requiring energy to build larger molecules from smaller molecules in the presence of oxygen
 - B. A chemical reaction requiring energy to build larger molecules from smaller molecules in the absence of oxygen
 - C. Chemical reactions that break down complex organic compounds into simpler compounds in the presence of oxygen
 - D. Chemical reactions that break down complex organic compounds into simpler compounds in the absence of oxygen
10. Which of the following store(s) glycogen?
- I. Adipose tissue
 - II. Liver
 - III. Skeletal muscle
- A. II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
11. Which is a micronutrient?
- A. Water
 - B. Lipid (fat)
 - C. Protein
 - D. Mineral

Turn over

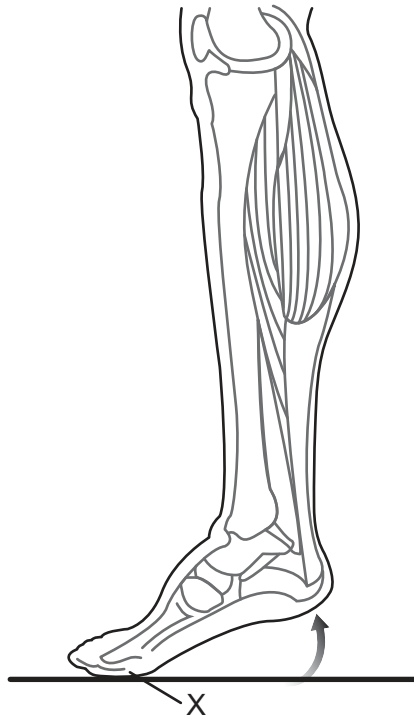
12. The diagram shows a motor unit. What is the structure labelled X?



[Source: By Designua / Shutterstock]

- A. Synapse
 - B. Axon
 - C. Dendrite
 - D. Nucleus
13. What is displacement?
- A. The rate of change in the position of an object
 - B. The total length along the path an object has travelled
 - C. The overall change in the position of an object
 - D. The speed of an object in a given direction

14. The diagram shows the operation of a lever when rising up on the toes. What is labelled X?

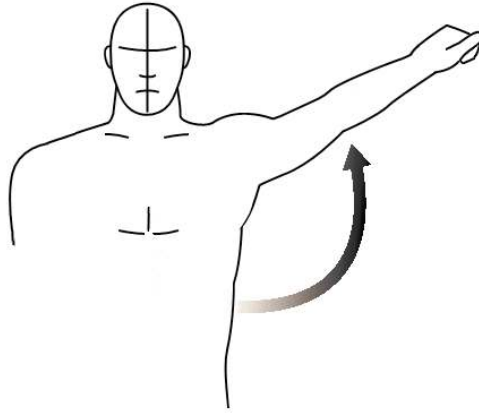


[Source: Adapted from MARTINI, FREDERIC H.; NATH, JUDI L.; BARTHOLOMEW, EDWIN F., FUNDAMENTALS OF ANATOMY & PHYSIOLOGY, 11th, ©2018. Reprinted by permission of Pearson Education, Inc., New York, New York.]

- A. Fulcrum
- B. Effort
- C. Load
- D. Resistance

Turn over

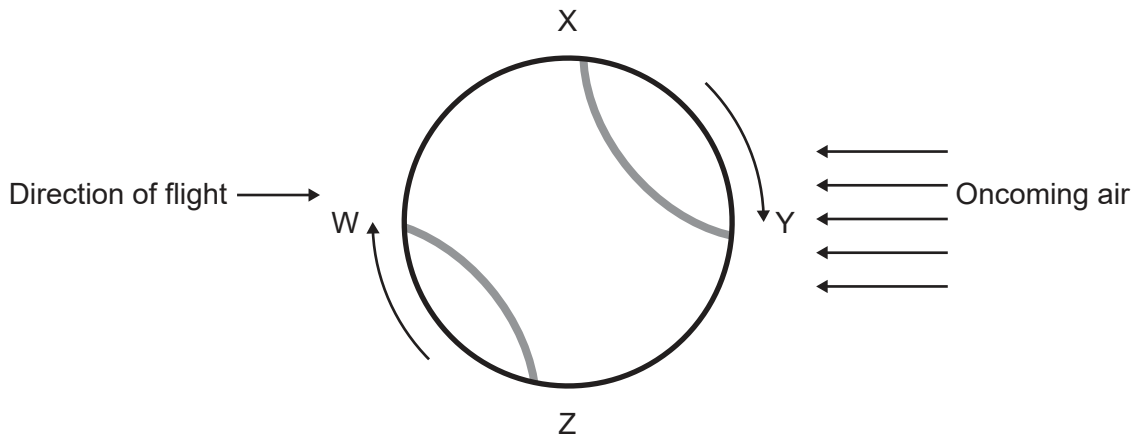
15. What movement is shown in this diagram?



[Source: © International Baccalaureate Organization 2018]

- A. Adduction
- B. Extension
- C. Abduction
- D. Flexion

16. The diagram shows a tennis ball in flight. The Bernoulli principle explains the difference in pressure around a spinning ball.



[Source: Adapted from J. Groppe, 1992, High tech tennis, 2nd ed. (Champaign, IL: Human Kinetics), 111.]

Which region surrounding the tennis ball has the highest pressure?

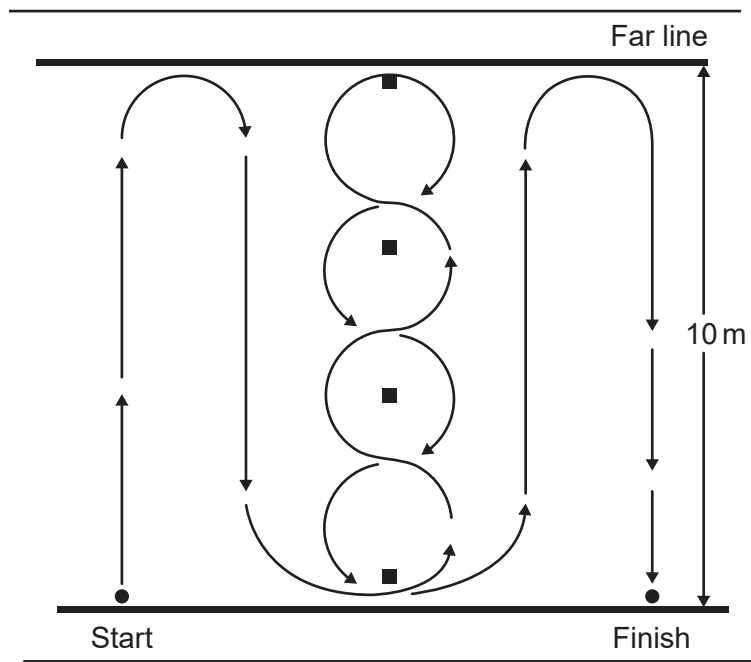
- A. W
 - B. X
 - C. Y
 - D. Z
17. What is skill?
- A. A general trait or capacity of an individual
 - B. A procedure for completing a task
 - C. The way an action is learned
 - D. The consistent production of goal-oriented movements
18. What is coding in memory improvement?
- A. Remembering short and specific details rather than long and vague information
 - B. Presenting information in a clear and logical format
 - C. Associating information with images
 - D. Storing information through repetition

Turn over

- 19.** Which describes knowledge of results feedback?
- A. The coach describing the quality of a performance
 - B. The coach providing technique information after a performance
 - C. A basketball player seeing that the ball went into the basket
 - D. A basketball player analysing their technique on replay
- 20.** Which is an example of Fleishman's physical proficiency ability?
- A. Swinging a golf club
 - B. Reacting quickly to a start signal in a sprint race
 - C. Lifting a heavy weight
 - D. Shooting an arrow in archery
- 21.** What is an example of background noise?
- A. An auditory stimulus which enhances relevant cues
 - B. A visual stimulus which interferes with relevant cues
 - C. An auditory stimulus relevant to the execution of a skill
 - D. A visual stimulus which enhances relevant cues
- 22.** Why is heart rate used to monitor exercise intensity?
- A. Due to its relationship with breathing
 - B. Due to its relationship with oxygen uptake
 - C. It is an accurate measure of perceived exertion
 - D. It is an accurate measure of gaseous exchange

23. What is the coefficient of variation?
- A. The spread of values around the mean
 - B. The measure of the statistical accuracy of an estimate of the distribution
 - C. The ratio of the standard deviation to the mean expressed as a percentage
 - D. The statistical measure that indicates the extent to which two or more variables fluctuate together

24. The diagram shows the set up for a fitness test. What fitness component is being tested?



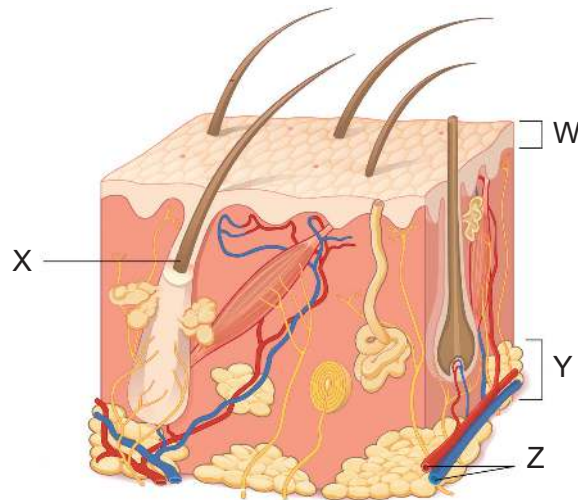
[Source: adapted from <http://www.police.nsw.gov.au>]

- A. Speed
- B. Reaction time
- C. Agility
- D. Aerobic capacity

Turn over

25. What is reliability?
- A. Becoming better at a particular exercise or skill
 - B. The quality or state of being correct or precise
 - C. A test that measures what it sets out to measure
 - D. Test results that are consistent and can be reproduced over time

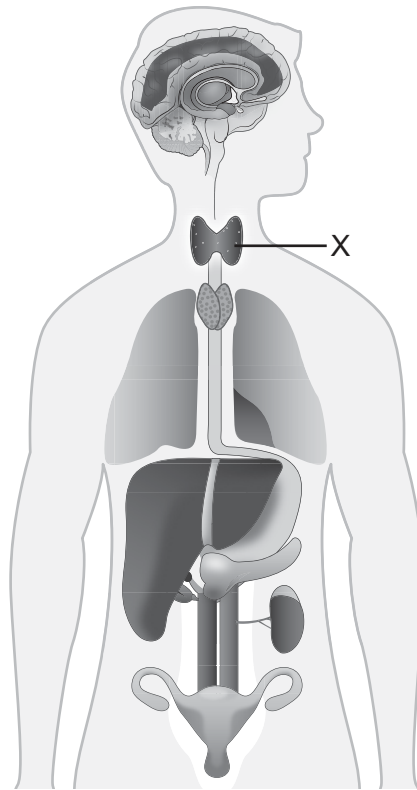
26. The diagram shows the structure of skin. Which letter correctly identifies the epidermis?



[Source: Adapted from Kelly A. Young *et al.*, *Anatomy & Physiology*, <https://cnx.org/contents/FPtK1znh@6.27:RxywCGkA@5/Layers-of-the-Skin> and shows the copyright info: © 1999-2018, Rice University. Reproduced under Creative Commons Attribution 4.0 License, <https://creativecommons.org/licenses/by/4.0/legalcode>.]

- A. W
 - B. X
 - C. Y
 - D. Z
27. What is a function of the brain stem?
- A. Perception of pain
 - B. Control of the autonomic nervous system
 - C. Perception of temperature
 - D. Respiratory control

28. The diagram shows the major endocrine organs in the human body. What organ is labelled X?



[Source: By ttsy/iStock Photos]

- A. Hypothalamus
 - B. Pituitary gland
 - C. Thyroid gland
 - D. Pancreas
29. What is the role of local hormones?
- I. To regulate and coordinate a range of bodily functions
 - II. To affect only specific target cells by binding to specific receptors
 - III. To act on neighbouring cells without entering the bloodstream
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

Turn over

- 30.** What is fatigue?
- A. More training than an athlete can physically tolerate
 - B. Transient overtraining
 - C. A reversible exercise-induced decline in performance
 - D. A period of sickness affecting the body or mind
- 31.** Which is a characteristic of peripheral fatigue?
- A. It develops during prolonged exercise.
 - B. It develops rapidly and is caused by reduced muscle cell force.
 - C. It is caused by impaired function of the central nervous system.
 - D. It is associated with neurochemical changes in the brain.
- 32.** What is drag?
- A. The force that acts parallel to the interface of two surfaces that are in contact, and opposes their relative motion
 - B. The force or forces acting to oppose the motion of an object through a fluid medium
 - C. The inverse relationship between airflow velocity and air pressure
 - D. The force or forces acting to promote the motion of an object through a fluid medium

33. The diagram below shows some forces acting on an athlete. What forces are labelled X, Y and Z?



[Source: © International Baccalaureate Organization 2018]

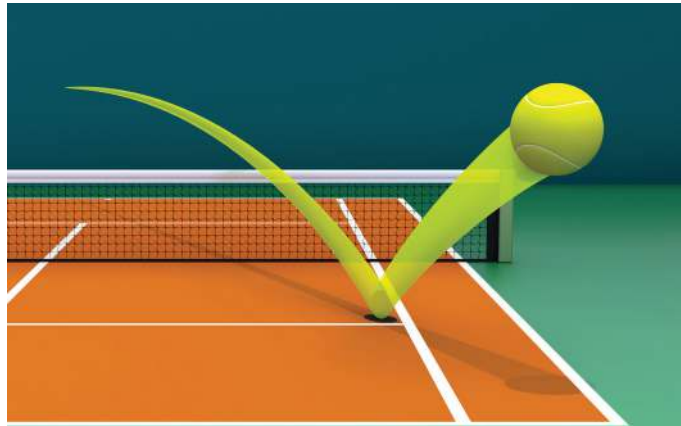
| | X | Y | Z |
|----|-----------------|-----------------|-----------------|
| A. | Friction | Body weight | Ground reaction |
| B. | Body weight | Ground reaction | Friction |
| C. | Friction | Ground reaction | Body weight |
| D. | Ground reaction | Friction | Body weight |

34. Which is a feature of traditional pedagogy in sports?

- A. Process-oriented learning
- B. Development of creative processes in athletes
- C. High-level connectivity between athletes and coaches
- D. Content-focused learning

Turn over

35. What type of motion tracking technology does the following diagram represent?



[Source: By mipan/iStock Photos]

- A. Bodybyte
 - B. Dartfish
 - C. Prozone
 - D. Hawkeye
36. Which describes a performance outcome model of qualitative biomechanical analysis for an individual sports technique?
- A. Preparation
 - B. Coordination principles
 - C. Retraction
 - D. Action
37. How can genes influence human characteristics?
- I. By coding for proteins which are responsible for the development of an individual
 - II. By determining measurable heritable characteristics for each individual
 - III. By ensuring stability of human characteristics through resistance to external factors
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

38. Which statement is correct for the inheritance of human characteristics?
- A. Some genes may be inactive until switched on by the environment.
 - B. Human characteristics are solely determined by the environment.
 - C. Genes are inherited mainly from the mother.
 - D. There are not many combinations of genes as only two parents are involved.

39. Which feature shows adaptive immunity to damage or infection?
- A. Skin cells forming a barrier to the entry of bacteria
 - B. Acidic conditions in the stomach to kill pathogens
 - C. Mucous in the nose to trap dust and pathogens
 - D. Inflammation at the site of a wound

40. Which combination of strategies minimizes risk from infection among athletes?

| | | |
|----|--|--|
| A. | Sufficient recovery time in the training programme | Maintain low fat diet |
| B. | Maintain good personal hygiene | Ensure sufficient sleep |
| C. | Maintain low fat diet | Maintain good personal hygiene |
| D. | Avoid drinking water | Sufficient recovery time in the training programme |