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Sports, exercise and health science
Higher level
Paper 1

Wednesday 28 October 2020 (afternoon)

1 hour

Instructions to candidates

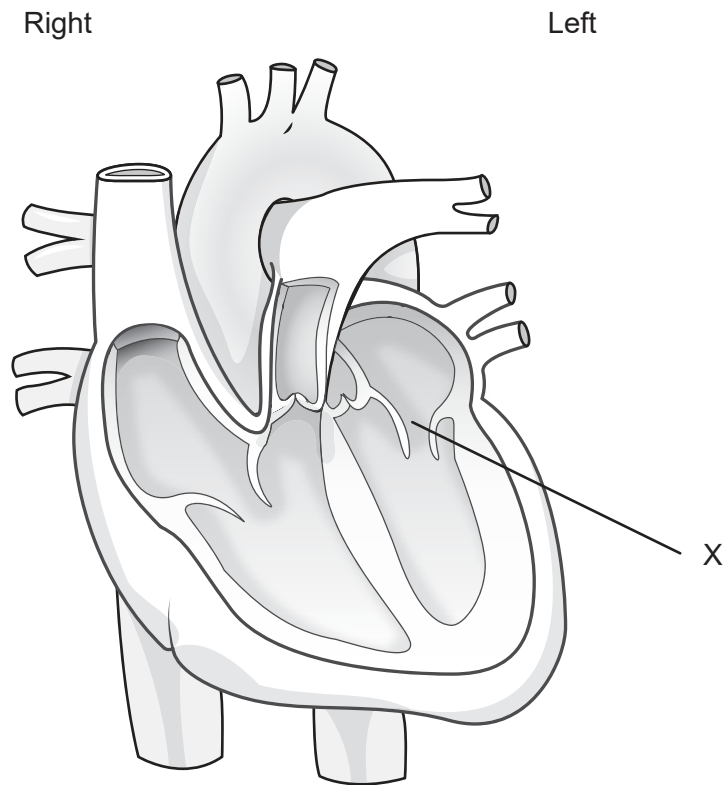
- Do not open this examination paper until instructed to do so.
- Answer all the questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.
- The maximum mark for this examination paper is **[40 marks]**.

1. Which are parts of the pelvic girdle?
 - A. Femur and sacrum
 - B. Sacrum and ilium
 - C. Ilium and ischium
 - D. Ischium and femur

2. Which feature of the synovial joint covers the ends of the bones?
 - A. Synovial membrane
 - B. Bursa
 - C. Meniscus
 - D. Articular cartilage

3. What causes the change in blood acidity that results in increased ventilation?
 - A. Increased levels of carbon dioxide
 - B. Increased levels of oxygen
 - C. Decreased levels of carbon dioxide
 - D. Decreased levels of oxygen

4. The diagram shows the human heart. Which valve is labelled X?



- A. Bicuspid
- B. Tricuspid
- C. Aortic
- D. Pulmonary

5. What causes an increase in cardiac output during exercise?

	Stroke volume	Heart rate
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

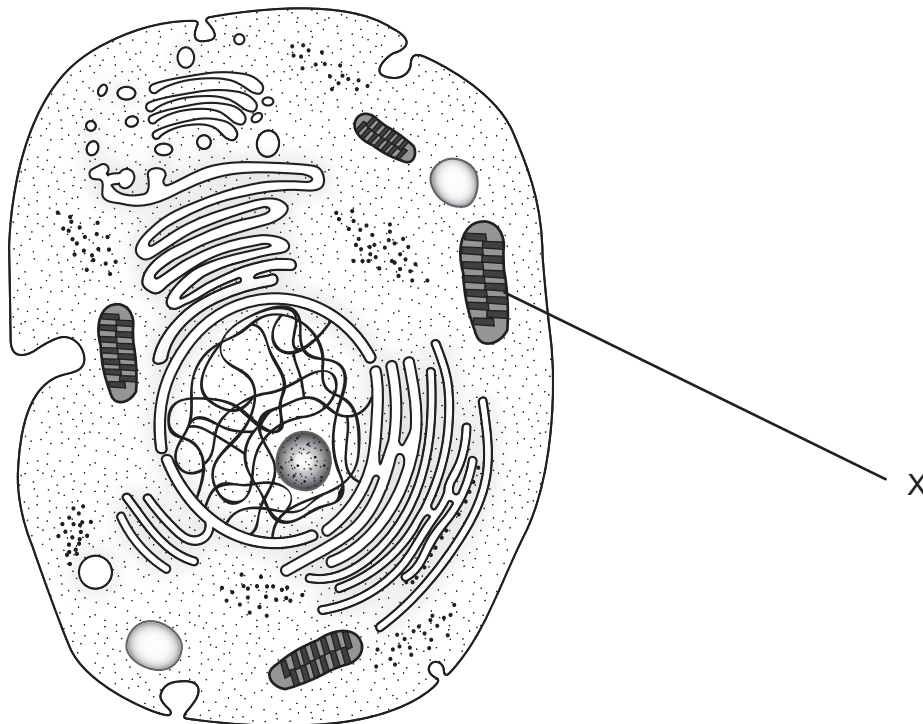
Turn over

6. Which tissues receive most of the blood during exercise?
- A. Kidneys and working muscles
 - B. Working muscles and brain
 - C. Brain and lungs
 - D. Lungs and kidneys
7. Which competitive activity requires the highest maximal oxygen consumption for a well-trained athlete?
- A. 10 km cross-country skiing
 - B. 20 minutes arm ergometry
 - C. 40 minutes cycling
 - D. 1 km canoe slalom
8. Which are macronutrients?
- I. Protein
 - II. Water
 - III. Carbohydrate
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
9. Which is a condensation reaction?
- A. Breaking of the bonds in glycogen and creation of a water molecule
 - B. Addition of two glucose molecules and creation of a water molecule
 - C. Breaking of the bonds in glycogen and absorption of a water molecule
 - D. Addition of two glucose molecules and absorption of a water molecule

10. An untrained individual with healthy BMI starts to train for a marathon. What change should they make to their diet?

	Calorie intake	Carbohydrates
A.	Decrease	Decrease
B.	Decrease	Increase
C.	Increase	Decrease
D.	Increase	Increase

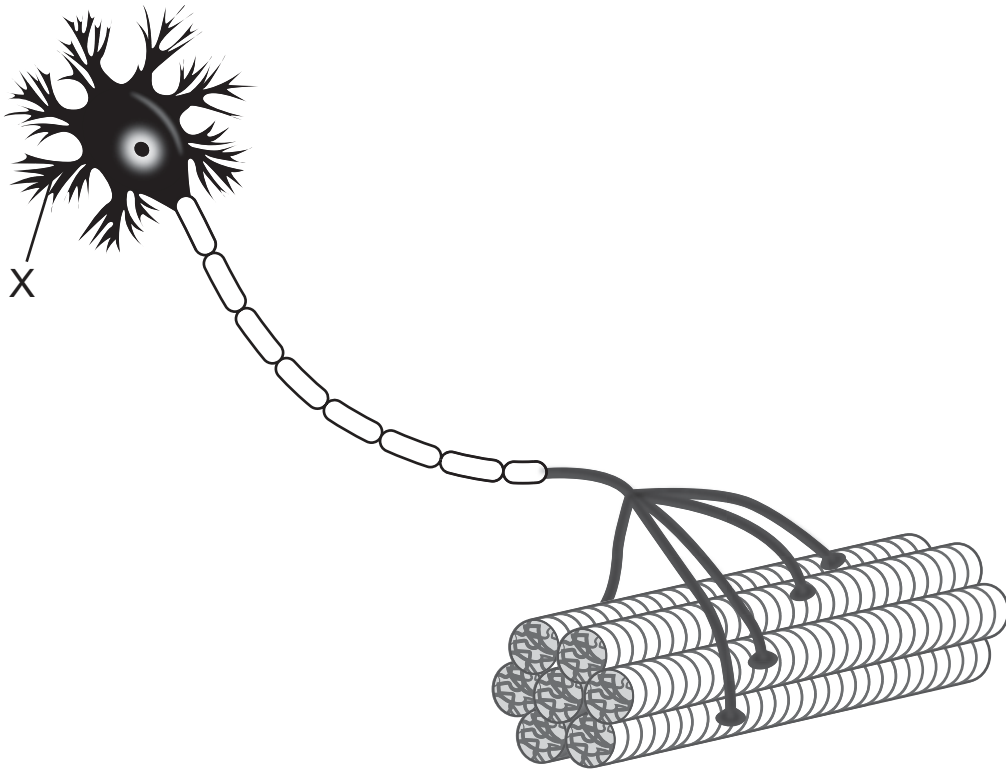
11. The diagram shows the ultrastructure of a generalized animal cell. What is the main function of the organelle labelled X?



- A. Protein synthesis
- B. Digestion of macromolecules
- C. Cellular respiration
- D. DNA storage

Turn over

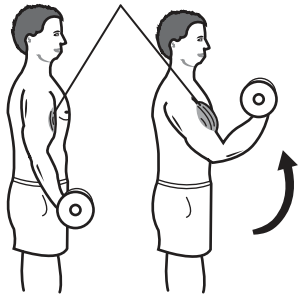
12. The diagram shows a motor unit. What is the structure labelled X?



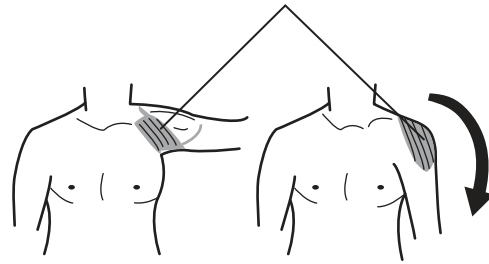
- A. Axon
- B. Nucleus
- C. Cell body
- D. Dendrite

13. The diagram shows joints in motion. Which shows a muscle undergoing eccentric contraction?

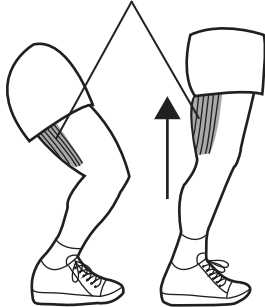
A. Biceps brachii



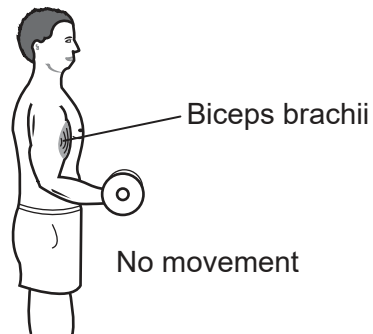
B. Deltoids



C. Hamstrings



D. Biceps brachii



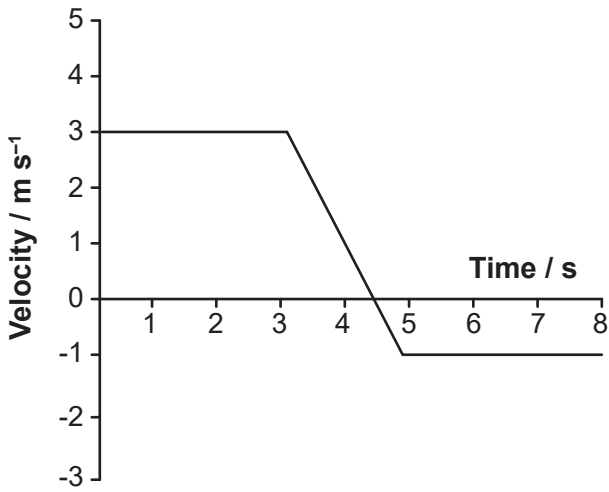
14. What causes an increase in angular velocity during a spin where no additional forces are applied after the initial push?

- A. Increase in radius
- B. Increase in mass
- C. Decrease in moment of inertia
- D. Decrease in angular momentum

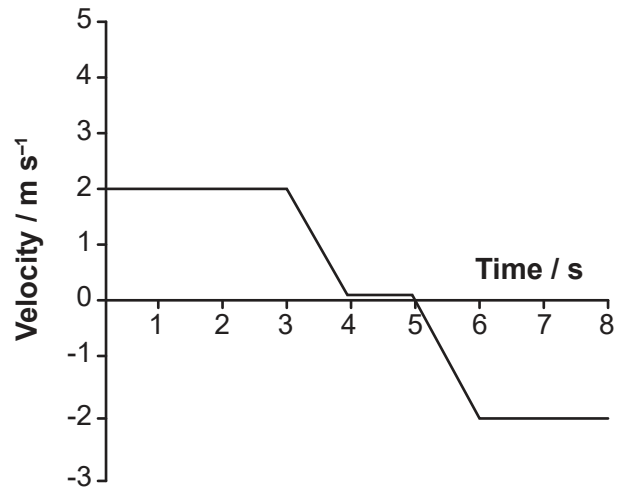
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15. The diagram shows velocity–time graphs. Which graph shows the greatest change in velocity?

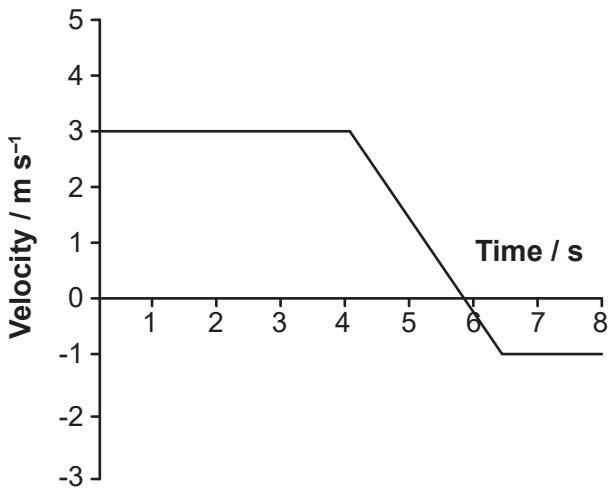
A.



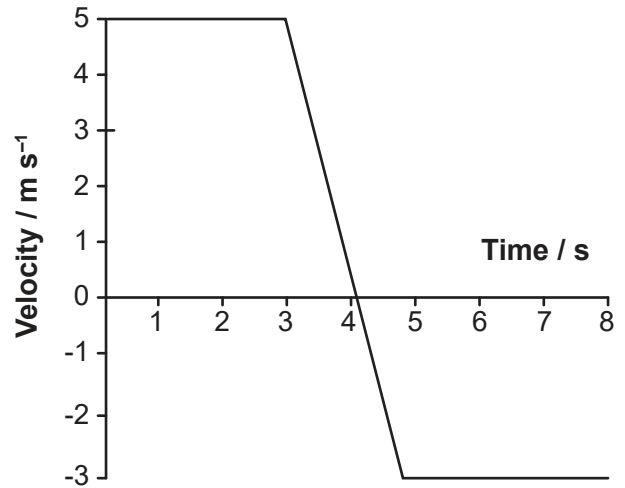
B.



C.



D.



16. What causes a golf ball to lift after being hit?

	Air pressure below the ball	Air pressure above the ball
A.	higher	higher
B.	lower	lower
C.	higher	lower
D.	lower	higher

17. What is skill?
- A. A general performance-related trait of an individual
 - B. A capacity to be coordinated
 - C. A consistent production of goal-orientated movements
 - D. The way a specific task is learned
18. A goalkeeper anticipates which way the ball will be kicked. According to Welford's model, which part of information processing is engaged before the goalkeeper decides which way to move?
- I. Perception
 - II. Short-term store
 - III. Effector control
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
19. Which is an example of information received through proprioceptors?
- A. Recognition of a cool temperature
 - B. Recognition of wind resistance
 - C. Detection of blood glucose concentration
 - D. Detection of the location of one's body in space
20. What is rehearsal in memory improvement?
- A. Grouping information into larger sets
 - B. Storing information through repetition
 - C. Associating information with prior experiences
 - D. Remembering specific details

Turn over

- 21.** What is the role of feedback in the learning process?
- I. Reinforcement of learning
 - II. Motivation
 - III. Adaptation of performance
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
- 22.** What does standard deviation represent?
- A. Deviation of negative values from a mean
 - B. Deviation of positive values from a mean
 - C. Spread of the variability of data around a mean
 - D. Statistical significance of variation around a mean
- 23.** Which procedure would assess the reliability of an experiment?
- A. Repeat the experiment to determine if the results remain the same
 - B. Test the degrees of precision of the instruments
 - C. Conduct similar tests that measure changes in the same dependent variable
 - D. Determine how close the measurements are to the true value
- 24.** Which is correct about the Physical Activity Readiness Questionnaire (PAR-Q)?
- A. PAR-Q is used to determine the possible health risks of an exercise programme.
 - B. The PAR-Q form helps to diagnose cardiac issues.
 - C. If a PAR-Q is completed, it confirms that there will be no risk of injury.
 - D. PAR-Q is a screening tool based on a person's athletic performance in previous competitive events.

25. Which method of monitoring exercise intensity uses a rating of perceived exertion?
- A. Determination of target heart rate
 - B. Determination of maximum heart rate
 - C. Borg scale
 - D. Karvonen method

26. The diagram shows a human brain. Which part is labelled X?



- A. Diencephalon
 - B. Brain stem
 - C. Cerebellum
 - D. Occipital lobe
27. Which process is the principal provider of energy in the brain?
- A. Aerobic respiration
 - B. ATP-CP system
 - C. Lactic acid system
 - D. Beta oxidation

Turn over

28. What controls the release of antidiuretic hormone (ADH) to the body?

	Location	Signal that causes the release of ADH
A.	Hypothalamus	Nerve impulses
B.	Hypothalamus	Neurohormones
C.	Pituitary gland	Nerve impulses
D.	Pituitary gland	Neurohormones

29. What is a reversible decline in performance due to exercise?

- A. Fatigue
- B. Exhaustion
- C. Heat stroke
- D. Dehydration

30. An athlete is given a cognitive test before and after an athletic performance. The test results are worse after the athletic performance. Which condition is the athlete experiencing?

- A. Peripheral fatigue
- B. Central fatigue
- C. Overtraining
- D. Overreaching

31. Which competition involves high-intensity exercise throughout?

- A. 10 km walking
- B. Olympic triathlon
- C. 500m track cycling
- D. 2 km swimming

32. Which opposing force reduces the motion parallel to the interface of two surfaces in contact?
- A. Friction
 - B. Newton's third law
 - C. Normal reaction force
 - D. Lift force
33. Which has the lowest coefficient of friction?
- A. A soccer boot turning on wet grass
 - B. A bike tyre rolling on a road
 - C. A beach volleyball bouncing on sand
 - D. A downhill ski moving on snow
34. Which is a characteristic of traditional (linear) pedagogy?
- A. Coach-led learning
 - B. Coach–athlete collaborative learning
 - C. Process-orientated learning
 - D. Athlete-led learning
35. A coach is teaching a class how to dribble a basketball. Which is an example of an environmental constraint?
- A. Peer pressure
 - B. Self-organization
 - C. Rules of the game
 - D. Decision-making

Turn over

- 36.** Which principle is a component of the performance outcome model in biomechanical analysis?
- A. Retraction
 - B. Action
 - C. Force
 - D. Follow-through
- 37.** Which factor has the greatest effect on an elite athlete's performance?
- A. Specificity of training
 - B. Inherited characteristics
 - C. Elite coaching
 - D. Presently not known
- 38.** What typically results from high and prolonged training loads?
- A. An increase in cortisol levels
 - B. A decrease in insulin levels
 - C. An increase in glucagon levels
 - D. A decrease in circulating hormone levels
- 39.** What makes sedentary people less susceptible to infections than elite athletes?
- A. They have higher leucocyte numbers due to less stress on the body.
 - B. They have increased inflammation due to muscle damage.
 - C. They have lower leucocyte numbers due to the stress of the exercise.
 - D. They have greater exposure to airborne bacteria due to poor health.

40. Which is an effective method of maintaining an athlete's health?
- A. Sharing water bottles to maintain hydration
 - B. Eating a high glycemic index diet
 - C. Sleeping six hours a day
 - D. Ensuring sufficient recovery from training
-

References:

4. **[diagram: human heart]** 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>.
11. **[diagram: animal cell]** Siyavula Education, Grade 10 Life Science: Cell Structure And Function, <https://www.siyavula.com/read/science/grade-10-lifesciences/cells-the-basic-units-of-life/02-cells-the-basic-units-of-life-02>. Everything Maths and Sciences textbooks can be freely downloaded at www.siyavula.com. Republished under Creative Commons Attribution 4.0 International licence, <https://creativecommons.org/licenses/by/4.0/legalcode>.
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