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Sports, exercise and health science
Standard level
Paper 1

Wednesday 28 October 2020 (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]**.

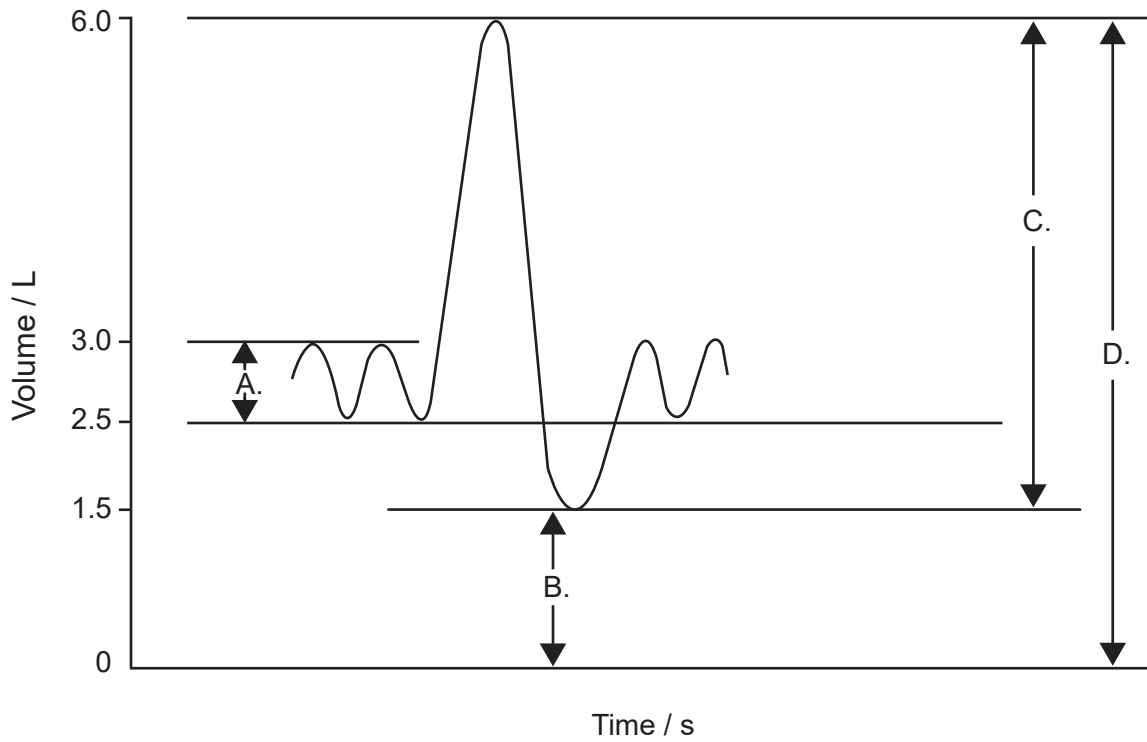
1. Which are parts of the pectoral girdle?
 - A. Ribs and clavicle
 - B. Clavicle and scapula
 - C. Scapula and humerus
 - D. Humerus and ribs

2. Which are functions of the axial skeleton?
 - I. To protect internal organs
 - II. To provide sites for attachment of muscle
 - III. To stabilize parts of appendicular skeleton
 - A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

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

4. Which are principal structures of the ventilatory system?
 - I. Lungs
 - II. Heart
 - III. Alveoli
 - A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

5. The diagram shows various lung volumes. Which label represents tidal volume?

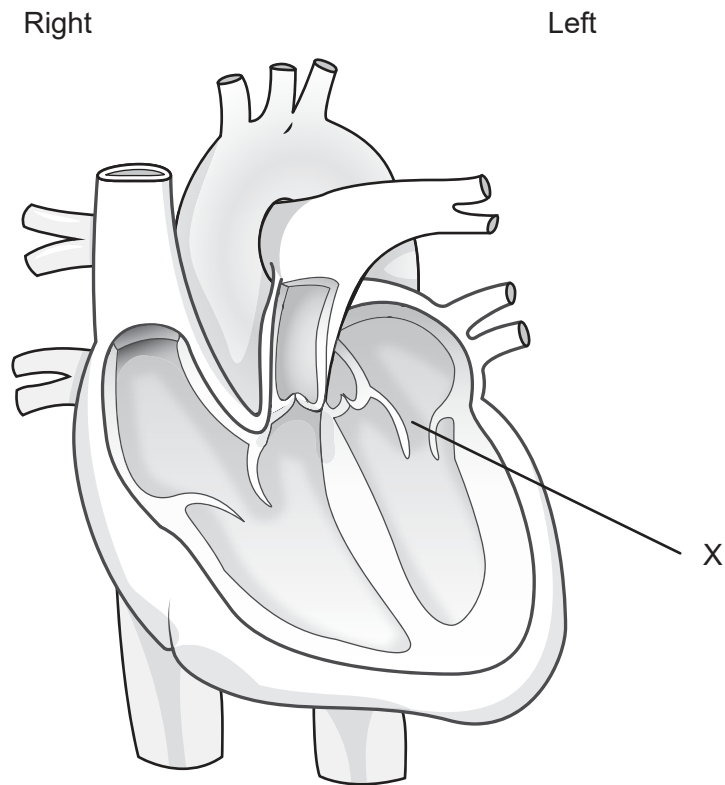


6. What promotes passive diffusion during inspiration?

	Partial pressure O ₂ in pulmonary capillaries	Partial pressure CO ₂ in pulmonary capillaries
A.	low	low
B.	high	high
C.	low	high
D.	high	low

Turn over

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



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

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

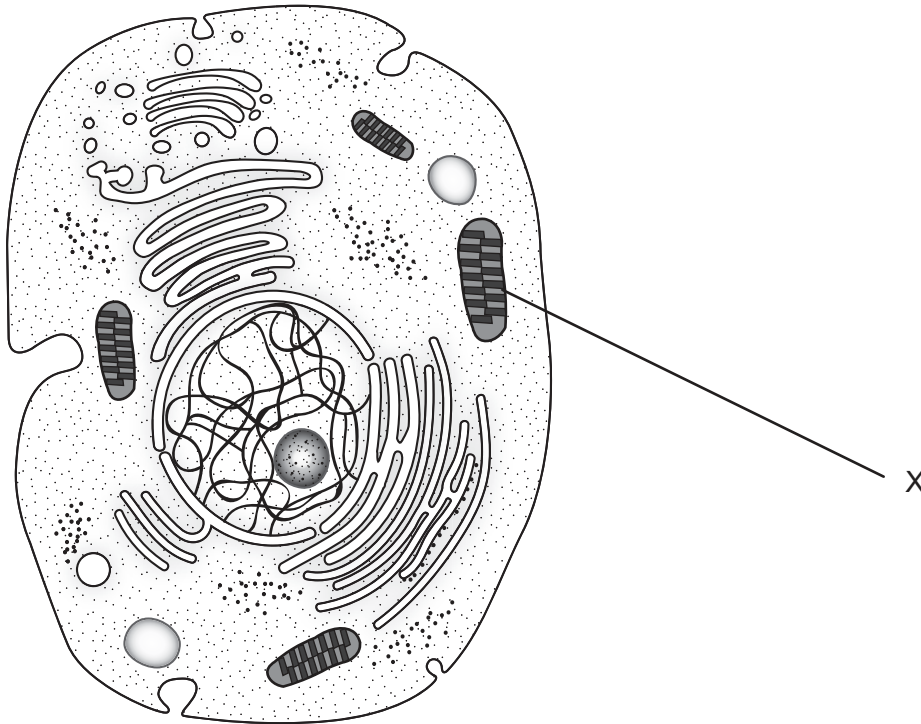
	Stroke volume	Heart rate
A.	Increase	Increase
B.	Increase	Decrease
C.	Decrease	Increase
D.	Decrease	Decrease

9. 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
10. 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
11. 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

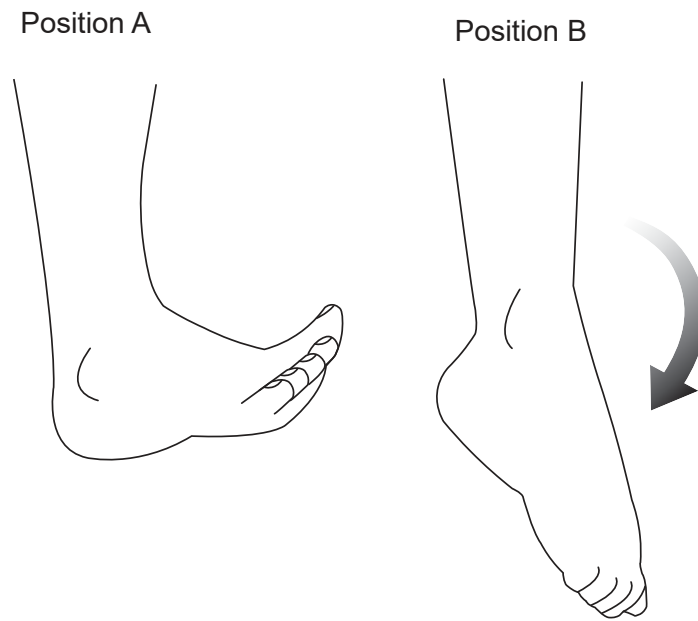
12. What is an anabolic reaction?
- A. When small molecules are combined into larger molecules
 - B. When complex molecules are broken into smaller molecules
 - C. When there is a net release of energy
 - D. When no energy is used or released within the reaction

13. 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
14. What are major sites for triglyceride storage in the body?
- I. Liver
 - II. Skeletal muscle
 - III. Adipose tissue
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

15. What type of movement takes place from Position A to Position B in the diagram?

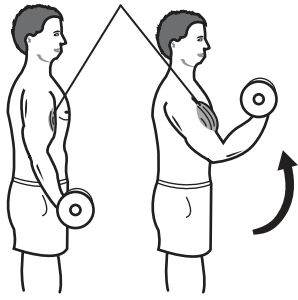


- A. Eversion
- B. Inversion
- C. Dorsi flexion
- D. Plantar flexion

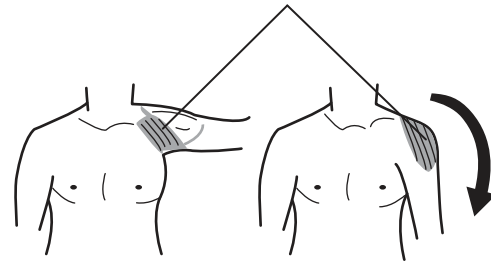
Turn over

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

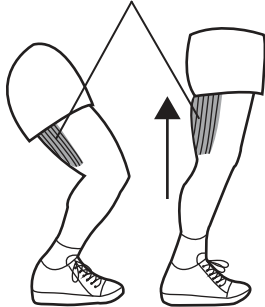
A. Biceps brachii



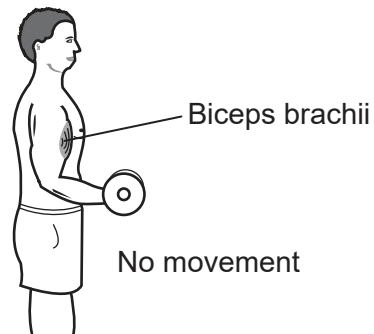
B. Deltoids



C. Hamstrings



D. Biceps brachii

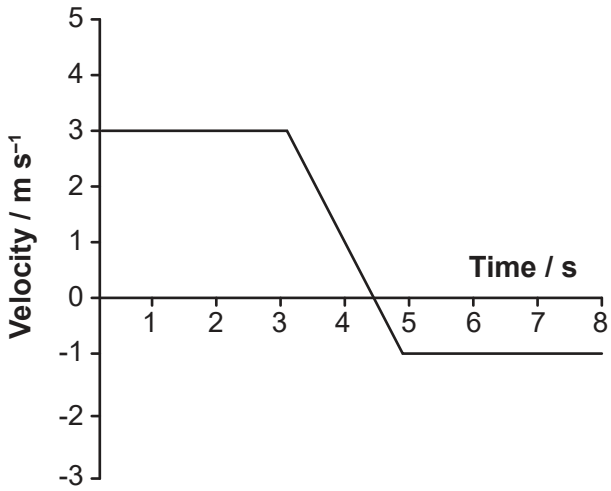


17. What causes an increase in angular velocity during a spin where no additional forces are applied after the initial push?

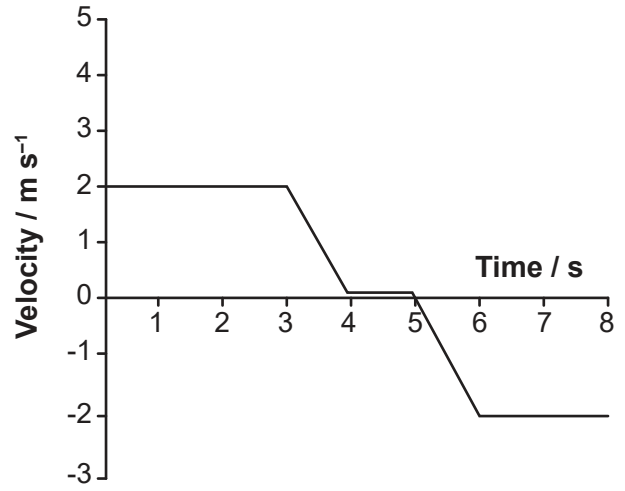
- A. Increase in radius
- B. Increase in mass
- C. Decrease in moment of inertia
- D. Decrease in angular momentum

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

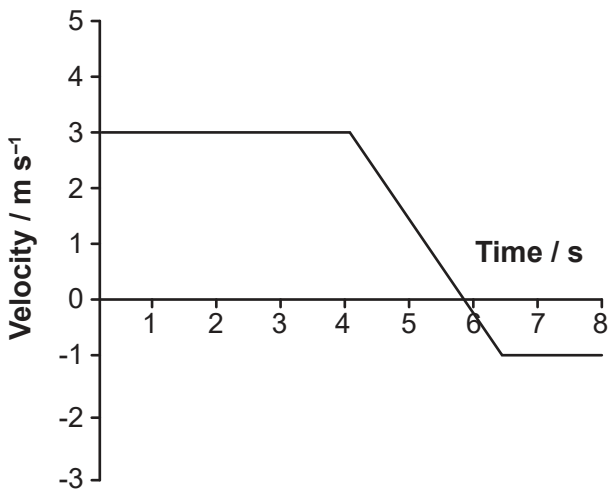
A.



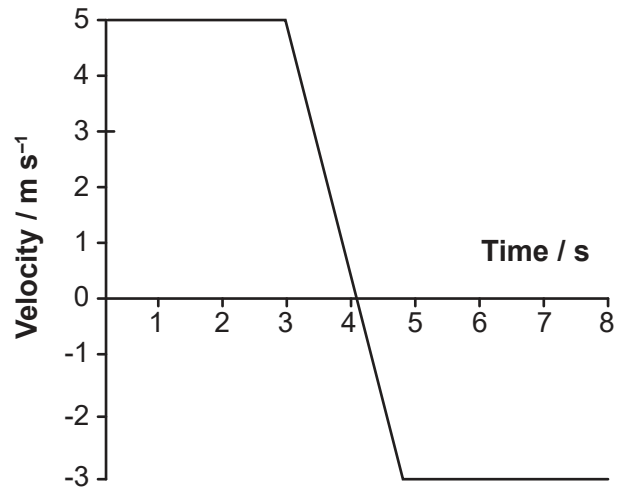
B.



C.

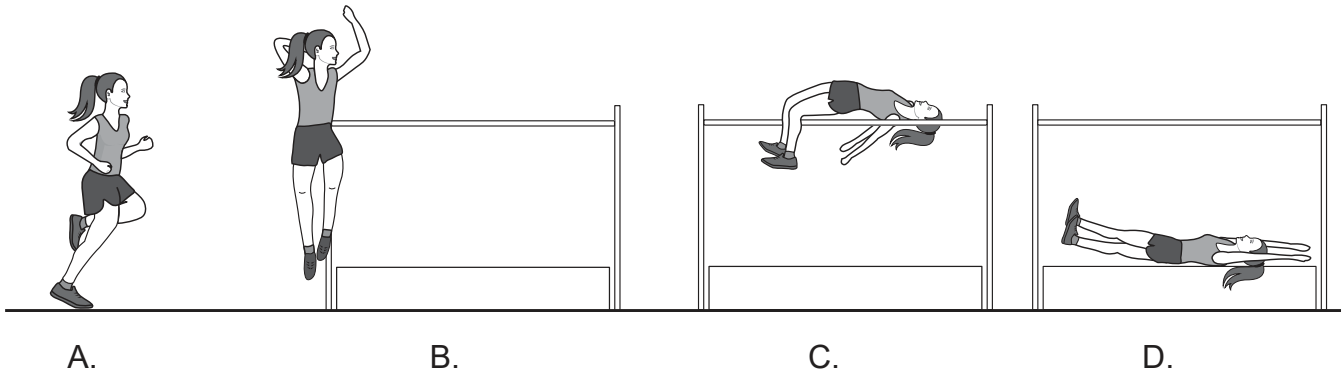


D.



Turn over

19. The diagram shows a high jumper performing a Fosbury Flop. During which phase is the centre of mass outside the athlete?



20. 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

21. What is an example of an open skill?

- A. A serve in tennis
- B. A free throw in basketball
- C. A javelin throw
- D. A pass in soccer

- 22.** What is an ability?
- A. A general trait or capacity of an individual
 - B. A learned movement that is specific to the task
 - C. A consistent production of goal-oriented movements
 - D. The way an action is learned
- 23.** What is an example of a perceptual motor ability?
- A. Strength
 - B. Reaction time
 - C. Flexibility
 - D. Endurance
- 24.** 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
- 25.** 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

- 26.** What is movement time?
- A. Response time – reaction time
 - B. Response time + reaction time
 - C. Response time \times reaction time
 - D. Response time \div reaction time
- 27.** 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
- 28.** 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
- 29.** 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.

30. What is a benefit of a maximal test?
- A. Typically, it is safer than sub-maximal tests.
 - B. Typically, it is more accurate than sub-maximal tests.
 - C. Typically, it is easier to recruit participants.
 - D. Typically, participants experience a quick recovery.
-

References:

- 7. **[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>.
- 13. **[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>.
- 15. **[diagram: foot]** Adapted from Kanthi.M.H, George V.I, Mruthyunjaya H.S, “Fuzzy logic control for active Ankle Foot Orthosis”, IEEE International Conference on Fuzzy Systems (Fuzz IEEE), Hyderabad, India, July 7–10, 2013.
- 16. **[diagram: joints in motion]** © International Baccalaureate Organization 2020.
- 19. **[diagram: Fosbury Flop]** © International Baccalaureate Organization 2020.