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Sports, exercise and health science

Standard level

Paper 1

25 April 2024

Zone A afternoon | Zone B afternoon | Zone C afternoon

45 minutes

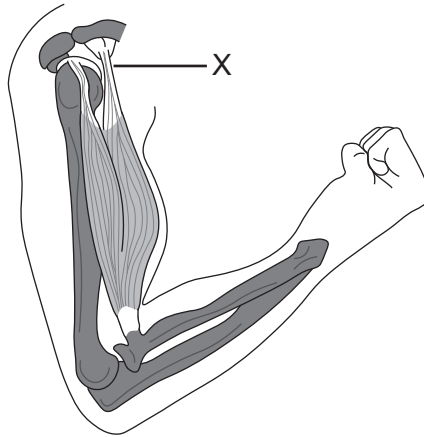
Instructions to candidates

- 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. What type of bone is the fibula?

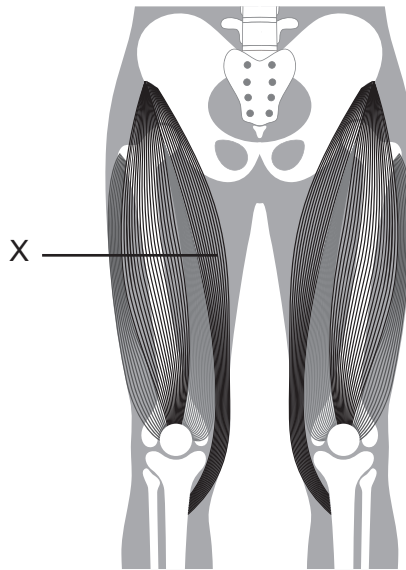
- A. Short
- B. Flat
- C. Long
- D. Irregular

2. What best describes the tendon labelled X?



- A. Origin
- B. Synergist
- C. Insertion
- D. Agonist

3. What is the muscle labelled X?



- A. Sartorius
 - B. Iliopsoas
 - C. Vastus medialis
 - D. Vastus lateralis
4. Which are functions of the conducting airways?
- I. Warming and moistening the air
 - II. Low resistance pathway for airflow
 - III. Increase air pressure
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III
5. What is defined as the maximum volume of air that can be exhaled after a maximum inhalation?
- A. Tidal volume
 - B. Residual volume
 - C. Vital capacity
 - D. Pulmonary ventilation

6. What percentage of oxygen in the blood is transported by hemoglobin as oxyhemoglobin?
- A. 37.0 %
 - B. 68.5 %
 - C. 80.0 %
 - D. 98.5 %

7. What causes oxygen to move from the alveoli into the pulmonary capillaries?
- A. A lower concentration of O₂ in the alveoli than in the blood
 - B. A higher concentration of O₂ in the alveoli than in the blood
 - C. A lower concentration of CO₂ in the alveoli than in the blood
 - D. A higher concentration of CO₂ in the alveoli than in the blood

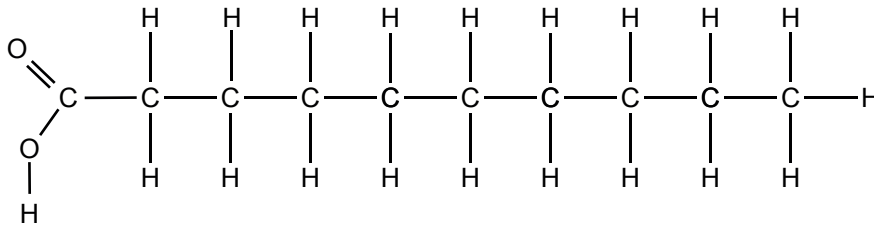
8. What effect does the sympathetic nervous system have on cardiovascular function?

	Heart rate	Coronary arteries	Contraction force
A.	Decrease	Dilate	Decrease
B.	Increase	Dilate	Increase
C.	Decrease	Constrict	Decrease
D.	Increase	Constrict	Increase

9. Why does running have a greater maximal oxygen consumption compared to cycling?
- A. Increased acceleration
 - B. Greater number of motor units recruited
 - C. Less glycogen is used
 - D. Smaller range of motion

10. Which food is most likely to promote growth and repair of muscles?
- A. White rice
 - B. Green apple
 - C. Red lentils
 - D. Olive oil

11. What type of fatty acid is represented in the diagram shown?



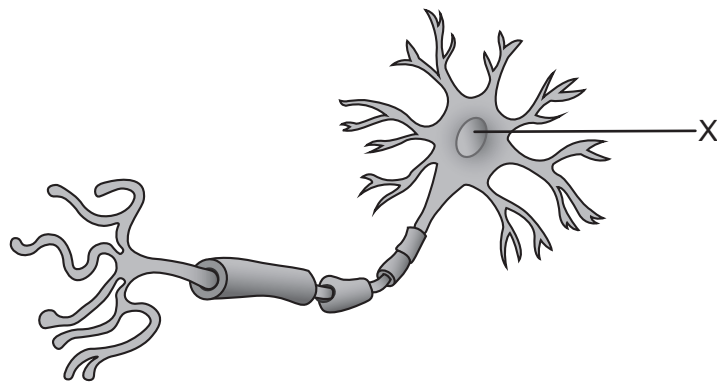
- A. Trans fat
 - B. Monounsaturated fat
 - C. Polyunsaturated fat
 - D. Saturated fat
12. What are the general recommendations for a healthy balanced diet?

	Carbohydrate	Protein	Fat
A.	10-15%	15-30%	80-90%
B.	55-75%	10-15%	15-30%
C.	15-30%	55-75%	10-15%
D.	80-90%	15-30%	55-75%

13. What is the role of the Golgi apparatus in the cell?
- A. It is the site of aerobic respiration.
 - B. It contains chromosomes and nucleolus.
 - C. It packages proteins for secretion.
 - D. It contains digestive enzymes.

14. What is the main fuel source for an elite athlete in a 400 m running race?
- A. Creatine phosphate
 - B. Glycogen
 - C. Lactic acid
 - D. Amino acid

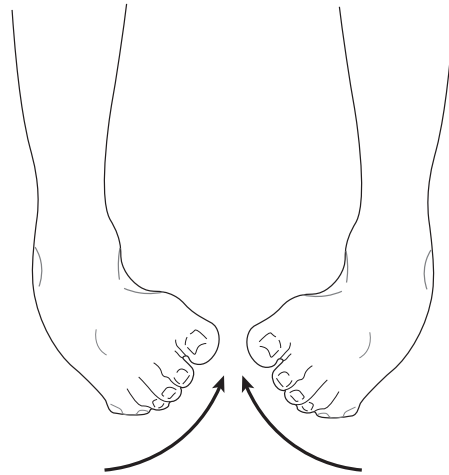
15. The diagram shows a motor unit. What structure is labelled X?



- A. Nucleus
 - B. Cell body
 - C. Axon
 - D. Motor end plate
16. What are the predominant muscle fibre characteristics of an elite 100 m sprinter's gastrocnemius?

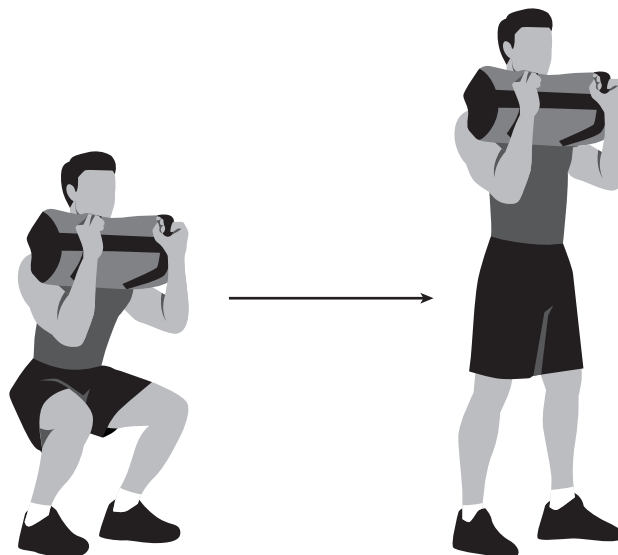
	Capillary supply	Contraction force	Glycogen content
A.	High	High	Low
B.	High	Low	High
C.	Low	High	High
D.	Low	Low	High

17. What is the movement demonstrated in the image shown?



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

18. What is the role of the rectus femoris in the movement of the knee during the movement sequence shown?



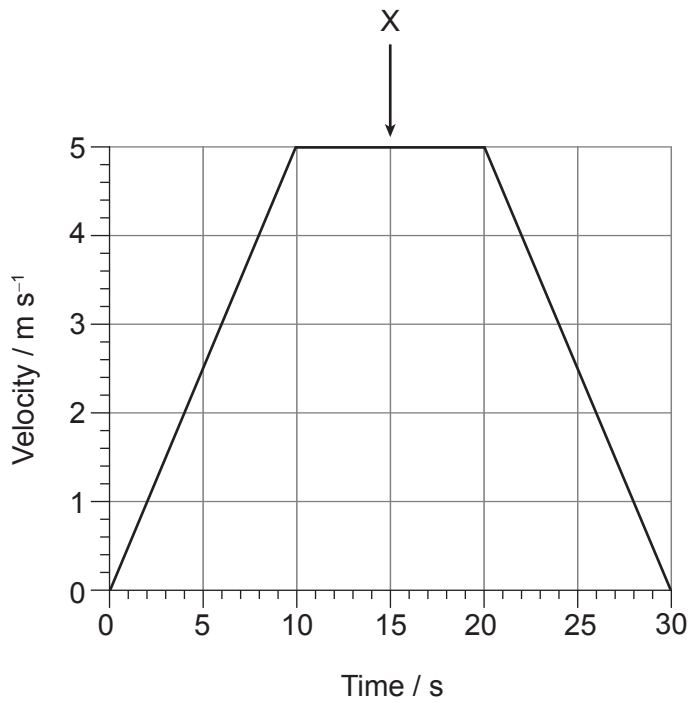
- A. Agonist
- B. Antagonist
- C. Synergist
- D. Stabiliser

19. Which minimizes the effects of delayed onset muscle soreness (DOMS)?

- I. Increasing the eccentric component of muscle contraction
- II. Increasing the intensity of resistance training gradually
- III. Reducing the concentric component of muscle contraction

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III

20. What does the area labelled X on the velocity–time graph shown represent?



- A. Positive acceleration
- B. Negative acceleration
- C. Zero acceleration
- D. Changing acceleration

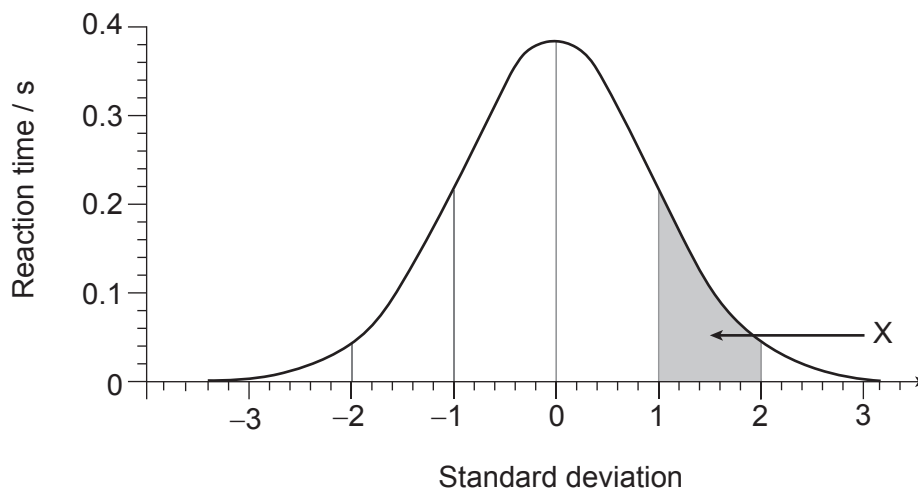
21. Which is a third-class lever?
- A. Extension of the elbow during a tennis serve
 - B. Tucking of the chin during a somersault in gymnastics
 - C. Plantar flexion of the ankle during a jump shot in basketball
 - D. Flexion of the elbow during a bicep curl in weightlifting
22. Which is a Fleishman perceptual motor ability?
- A. Gross body coordination
 - B. Reaction time
 - C. Dynamic flexibility
 - D. Explosive strength
23. What is the function of an exteroceptor?
- A. To provide information from within the body
 - B. To provide information about the position of limbs
 - C. To provide information about tension in a muscle
 - D. To provide information from outside the body
24. What factors impact the detection–comparison–recognition (DCR) process?
- I. Background noise
 - II. Intensity of stimulus
 - III. Capacity of short-term sensory store
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III

25. What adds a psychological refractory period (PRP)?
- A. Reacting to a starter in a 100m sprint
 - B. Receiving a serve in tennis
 - C. Defender responding to a fake shot in basketball
 - D. Moving to intercept a pass in hockey
26. A basketball coach removed a player from a team based on a post-game video analysis that identified a critical flaw in their shooting technique.

Which types of feedback were received by the player?

A.	Extrinsic	Knowledge of performance	Negative	Terminal
B.	Intrinsic	Knowledge of results	Positive	Concurrent
C.	Extrinsic	Knowledge of results	Negative	Concurrent
D.	Intrinsic	Knowledge of performance	Positive	Terminal

27. The graph shows the reaction times for a population completing an online test.



What is the approximate percentage of values falling in the segment labelled X?

- A. 68 %
- B. 34 %
- C. 95 %
- D. 14 %

28. What p value is considered statistically significant?
- A. < 1.0
 - B. < 0.08
 - C. < 0.06
 - D. < 0.05
29. A researcher administered a glucose-free drink as a control in a study on sports drinks. Which experimental technique is being used?
- A. Placebo
 - B. Randomization
 - C. Blinding
 - D. Double blinding
30. Which test evaluates a health-related component of fitness?
- A. Stork stand
 - B. Illinois agility
 - C. Multistage fitness (Leger) test
 - D. 40m sprint
-

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References:

3. Pikovit44, 2023. *Muscular system legs*. [online] Available at: <https://www.gettyimages.co.uk/detail/illustration/muscular-system-legs-royalty-free-illustration/1317361817?phrase=sartorius&adppopup=true> [Accessed 8 June 2023]. Source adapted.
18. lioputra, 2023. *Man doing Powerbag or sandbag squat in 2 steps in side view. Flat vector illustration isolated on white background*. [online] Available at: <https://www.gettyimages.co.uk/detail/illustration/man-doing-powerbag-or-sandbag-squat-in-2-royalty-free-illustration/1425908595?phrase=sandbag+squat&adppopup=true> [Accessed 16 June 2023]. Source adapted.