Diploma Programme
Programme du diplôme
Programa del Diploma

Sports, exercise and health science
Higher level
Paper 1

25 April 2024

Zone A afternoon | **Zone B** afternoon | **Zone C** 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]**.

2224 – 6813

15 pages

1. What type of bone is the radius?

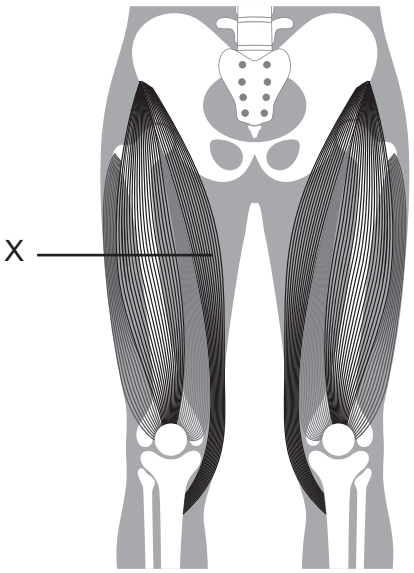
A. Short

B. Flat

C. Long

D. Irregular

2. What is the muscle labelled X?



A. Sartorius

B. Iliopsoas

C. Vastus medialis

D. Vastus lateralis

3. 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

4. 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 %

5. Which blood vessel directly supplies the cardiac tissue of the heart?

A. Pulmonary artery

B. Superior vena cava

C. Inferior vena cava

D. Coronary artery

6. Which changes occur in blood flow as a cyclist begins their training session?

	Cardiac output	**Blood vessels to working muscles**	**Blood vessels to digestive organs**
A.	Increases	Vasodilate	Vasoconstrict
B.	Increases	Vasoconstrict	Vasodilate
C.	Decreases	Vasodilate	Vasoconstrict
D.	Decreases	Vasoconstrict	Vasodilate

7. 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

8. What is the ratio of carbon, hydrogen and oxygen in a glucose molecule in fruit juice?

A. 1:2:1

B. 1:3:1

C. 6:14:2

D. 2:1:2

9. 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 %

10. 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.

11. Which cellular respiration process generates the most adenosine triphosphate (ATP) from one glucose molecule?

A. Anaerobic glycolysis

B. Beta oxidation

C. Electron transport chain

D. Krebs cycle

12. Which occurs during concentric muscle contraction?

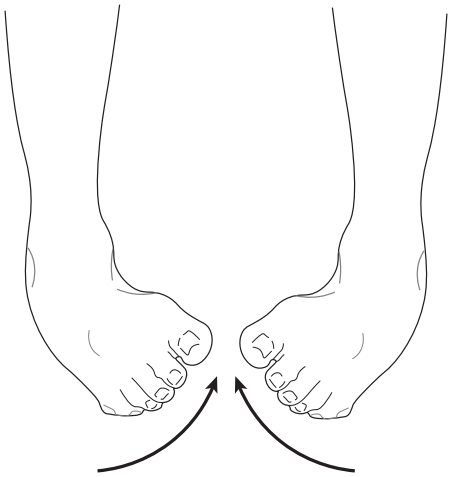
A. Z lines move apart

B. H zone increases in size

C. A band remains constant

D. Sarcomere lengthens

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



A. Eversion

B. Inversion

C. Plantar flexion

D. Dorsi flexion

14. 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

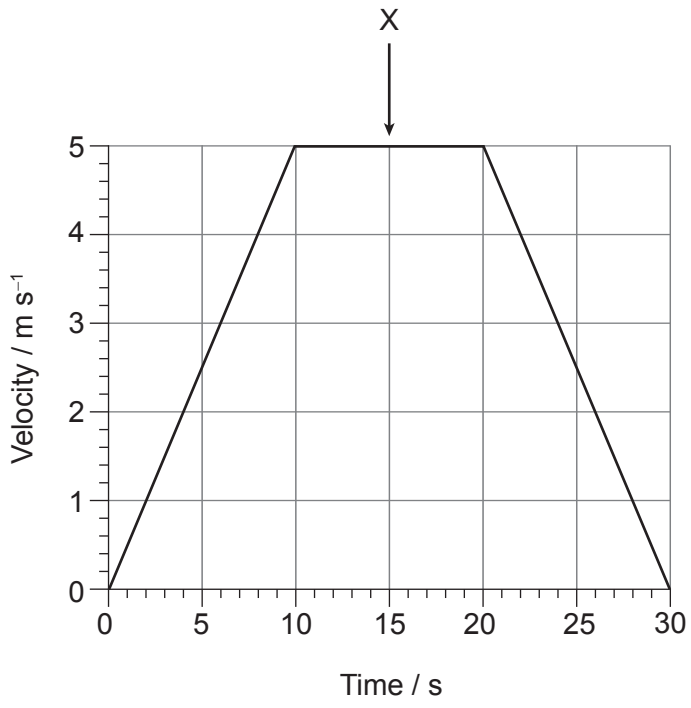
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

15. 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

16. 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

17. 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

18. Which is a Fleishman perceptual motor ability?

A. Gross body coordination

B. Reaction time

C. Dynamic flexibility

D. Explosive strength

19. 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

20. What adds a psychological refractory period (PRP)?

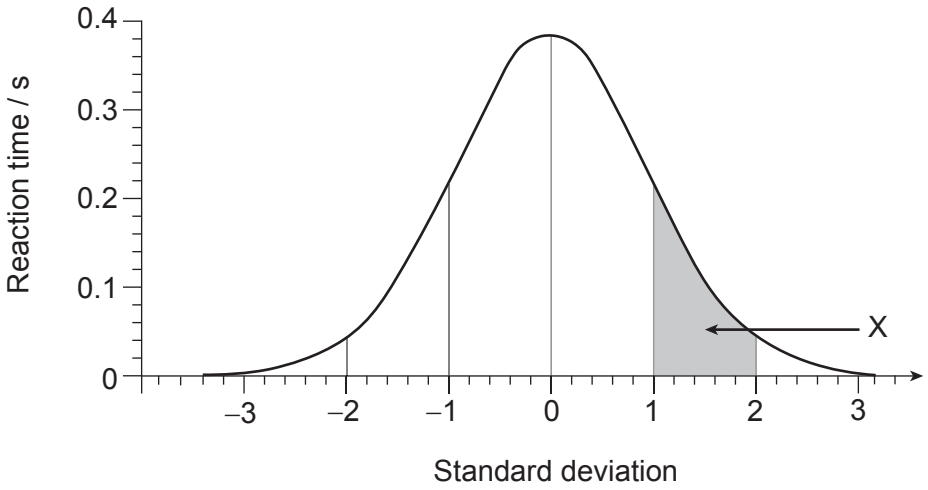
A. Reacting to a starter in a 100 m sprint

B. Receiving a serve in tennis

C. Defender responding to a fake shot in basketball

D. Moving to intercept a pass in hockey

21. 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 %

22. A study was investigating the effect of a sports drink. The researcher and participants did not know who was in the control or experimental group. Which experimental technique is being used?

A. Double blinding

B. Randomisation

C. Blinding

D. Placebo

23. Which test evaluates a performance-related component of fitness?

A. Harvard step test

B. Sit and reach

C. Multistage fitness (Leger) test

D. 40 m sprint

24. Which are considered essential elements of a general training program?

I. Overload and periodization

II. Warm-up and stretching activities

III. Cool down and recreational activities

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

25. What is the scale of perceived exertion in the diagram shown?

6	
7	Really, really easy
8	
9	Really easy
10	
11	Fairly easy
12	Moderate
13	Somewhat hard
14	
15	Hard
16	
17	Really hard
18	
19	Really, really hard
20	Maximum effort

A. CERT scale

B. OMNI scale

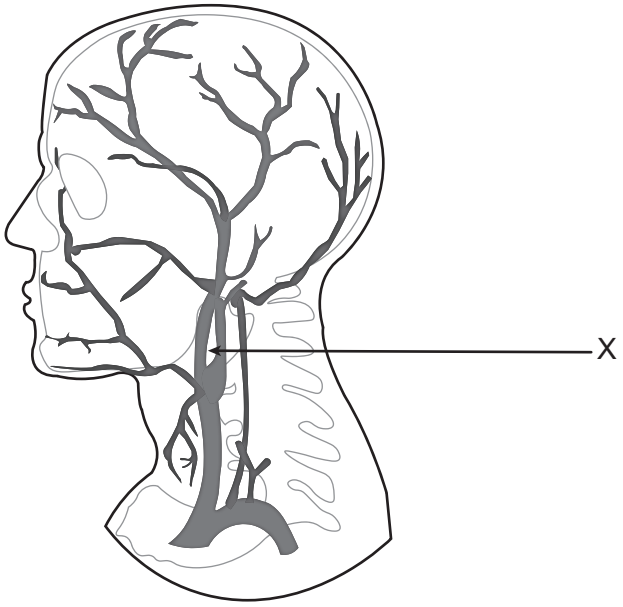
C. Borg scale

D. Training heart rate zone

26. What is the function of the epidermis layer of skin?

A.	Grows hair	Makes new skin	Produces sweat
B.	Protective barrier	Makes new skin	Provides skin colour
C.	Grows hair	Makes oil	Provides skin colour
D.	Protective barrier	Makes oil	Produces sweat

27. Which artery is labelled X?



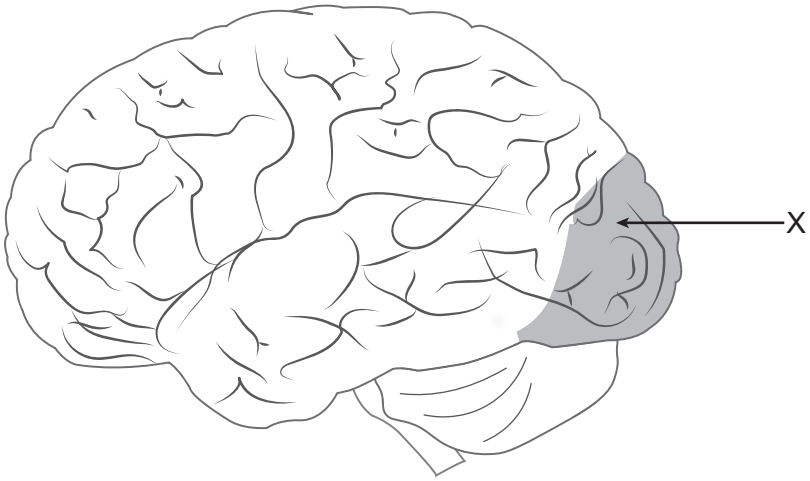
A. Aorta

B. Brachial

C. Vertebral

D. Carotid

28. What is the main function of lobe X?



A. Perception of sensation

B. Long-term memory

C. Primary visual cortex

D. Reasoning and motivation

29. Which endocrine organ is located superior to the pituitary gland?

A. Pineal gland

B. Hypothalamus

C. Adrenal gland

D. Pancreas

30. Which hormone is released from the testes?

A. Adrenaline

B. Testosterone

C. Growth hormone

D. Glucagon

31. Which is an example of high-intensity exercise?

A. Leisurely 10 km cycle

B. Walking 500 m to the park

C. Repeated bounding over hurdles for 20 m

D. Stand up paddleboarding for 5 km

32. What is a key feature of excess post-exercise oxygen consumption (EPOC)?

A. Creatine phosphate stores are exhausted

B. Resynthesis of muscle glycogen from lactate

C. Myoglobin stores are depleted

D. Hydrogen ions are produced

33. What is friction?

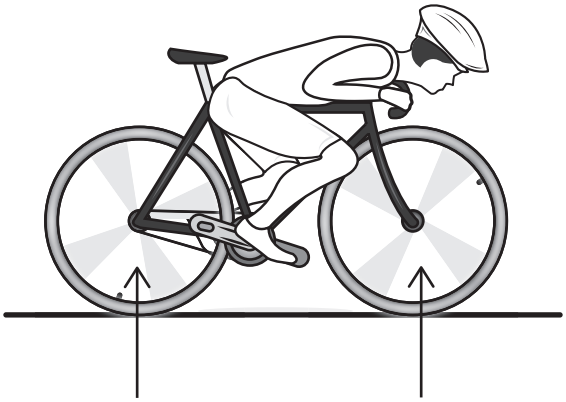
A. The force acting parallel to the interface of two surfaces that are in contact

B. The force or forces acting to oppose the motion of a tennis ball through the air

C. The force or forces acting to oppose the motion of an object through a fluid

D. The force that acts to increase the acceleration of objects

34. Which force do the arrows represent?



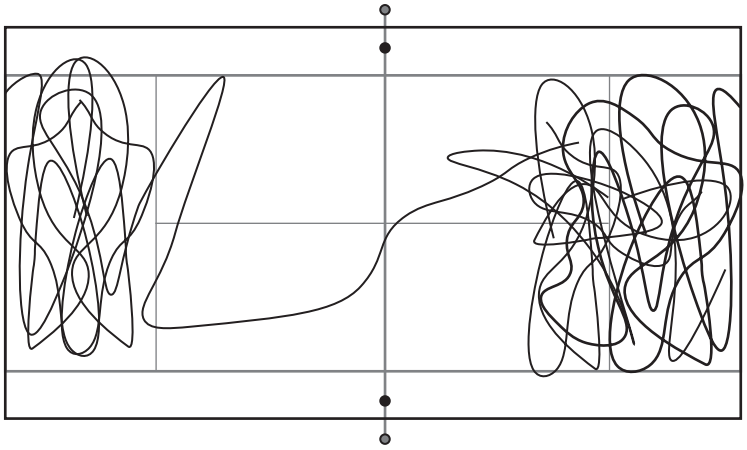
A. Air resistance

B. Friction

C. Ground reaction force

D. Body weight

35. A tennis player was tracked during a match using GPS technology.



What form of notation does this represent?

A. Tactical evaluation

B. Technical evaluation

C. Analysis of movement

D. Analysis of tactics

36. What aspects of sport can a frequency table analyse?

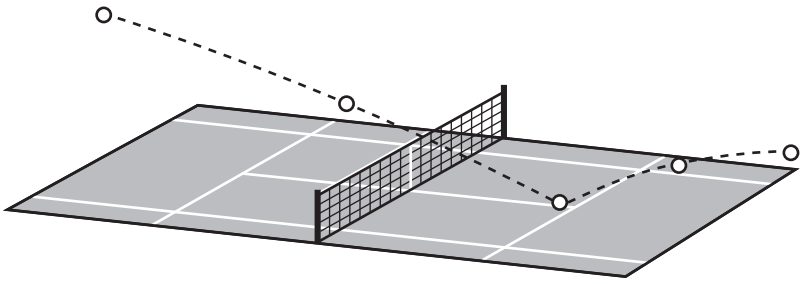
A. Player movement on a football (soccer) field

B. Goal kicking accuracy

C. Success of a team sequence in hockey

D. Golf swing technique

37. Which digital technology is being used to track the different trajectories of the ball?



A. Dartfish

B. Prozone

C. Hawkeye

D. Bodybyte

38. What determines the blood group of an individual?

A. Environment

B. Meiosis

C. RNA

D. Genotype

39. What is the function of the immune system?

I. Involved in tissue repair
II. Protection against pathogens
III. Production of erythrocytes

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

40. Which exercise programme could cause the greatest susceptibility to infection for an individual?

	Frequency	**Intensity**	**Activity**
A.	once a month	moderate	cycling
B.	three times a week	low	yoga
C.	once a day	high	running
D.	twice a day	low	walking

References:

2. 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.