Diploma Programme
Programme du diplôme
Programa del Diploma

Sports, exercise and health science
Higher level
Paper 1

2 May 2023

Zone A afternoon | **Zone B** morning | **Zone C** morning

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]**.

2223 – 6601

15 pages

1. What type of bone is a metacarpal?

A. Flat

B. Short

C. Irregular

D. Long

2. Which are features of the elbow joint?

A.	hinge	synovial
B.	pivot	cartilaginous
C.	hinge	fibrous
D.	pivot	synovial

3. The diagram shows a hamstring stretch being performed. Which muscle tissue characteristic is demonstrated by the hamstrings when an athlete performs a static stretch as part of their cool down routine?

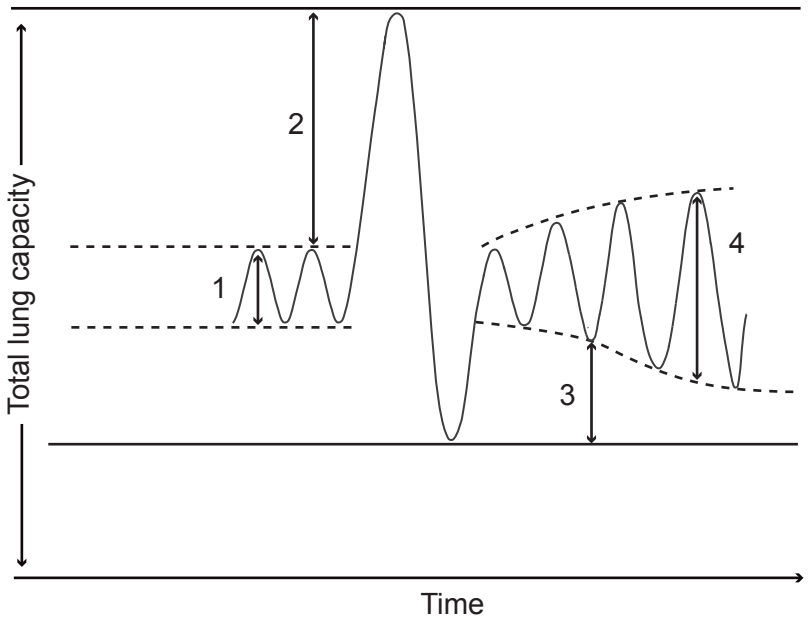
A. Contractility

B. Hypertrophy

C. Extensibility

D. Elasticity

4. The diagram shows a trace of pulmonary ventilation. Which number shows tidal volume for a person who is jogging?



A. 1

B. 2

C. 3

D. 4

5. Which of the following occurs during inhalation?

I. Diaphragm contracts

II. Chest cavity volume increases

III. Chest cavity pressure increases

A. I only

B. II only

C. I and II only

D. I, II and III

6. Which are functions of erythrocytes and leucocytes?

	Erythrocytes	**Leucocytes**
A.	Carry O_2 in blood	Carry CO_2 in blood
B.	Help with clotting of blood in damaged areas of the body	Carry O_2 and CO_2 in blood
C.	Help fight infections in the body	Help with clotting of blood in damaged areas of the body
D.	Carry O_2 and CO_2 in blood	Help fight infections in the body

7. What is the cardiovascular response during the first 5 minutes after completing a cycle race?

	Cardiac output	**Heart rate**	**Stroke volume**
A.	Remains constant	Decreases	Increases
B.	Decreases	Decreases	Decreases
C.	Increases	Increases	Increases
D.	Remains constant	Remains constant	Remains constant

8. Which describes the blood pressure in the vascular system?

A. Systolic blood pressure is a measure of the blood pressure in a person's veins when they are doing a flexed arm hang.

B. Diastolic blood pressure is measured when the left ventricle contracts.

C. Systolic blood pressure increases when someone goes for a 20-minute training run.

D. Diastolic blood pressure always adjusts equally with systolic blood pressure.

9. Which of the following is considered a micronutrient?

A. Calcium in milk

B. Protein in chicken

C. Fat from pork

D. Water from a bottle

10. Which types of fat are classified correctly?

	Relatively high saturated fat content	**Relatively high unsaturated fat content**
A.	Sunflower oil	Coconut oil
B.	Dairy yogurt	Avocado
C.	Coconut oil	Palm oil
D.	Avocado	Olive oil

11. Which best defines metabolism?

A. The breakdown of complex organic compounds into smaller ones.

B. The controlled release of energy in the form of adenosine triphosphate (ATP) from organic compounds.

C. The production of larger biochemical molecules from smaller ones.

D. All of the biochemical reactions that occur within an organism.

12. Which component of the aerobic energy system also occurs in the anaerobic system?

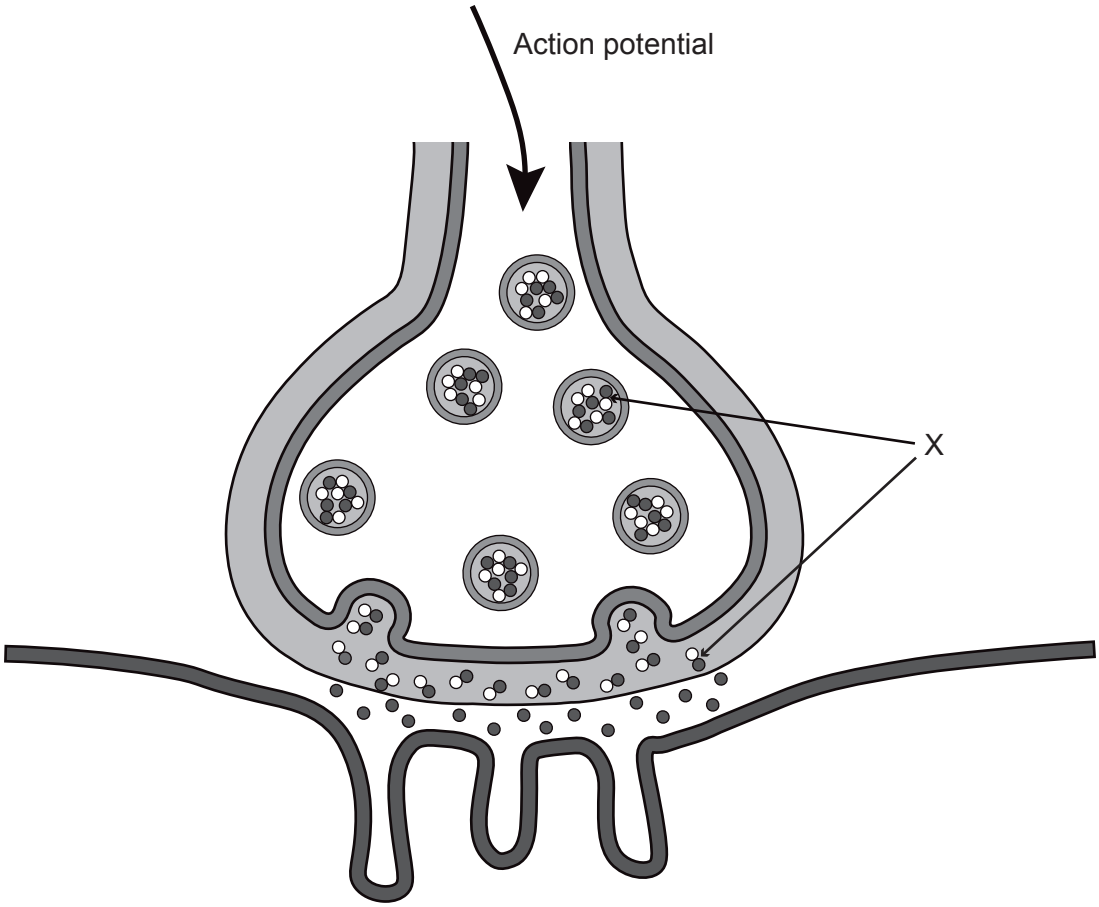
A. Krebs cycle

B. Electron transport chain

C. Glycolysis

D. There are no common components

13. The diagram shows a neuromuscular junction. What does X represent?



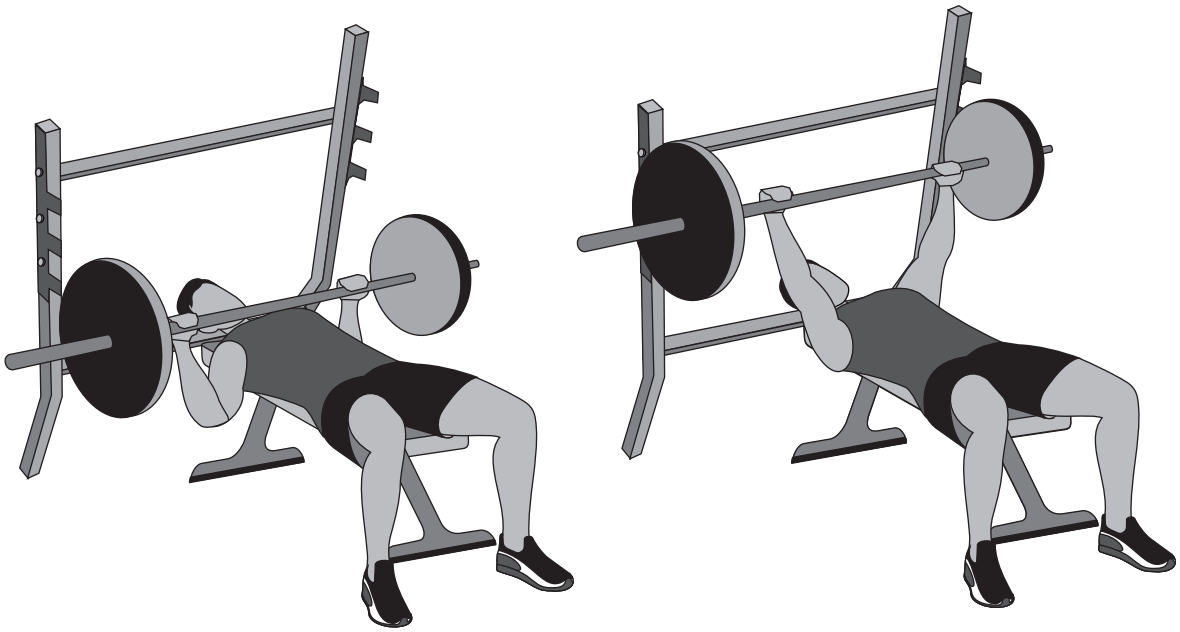
A. Calcium ions

B. Sodium ions

C. Cholinesterase

D. Acetylcholine

14. The diagram shows someone performing a bench press. Which muscle is the primary agonist, and what movement occurs at the shoulder during the upward phase of a bench press?



	Primary agonist muscle	**Movement at shoulder**
A.	biceps	extension
B.	pectoralis major	adduction
C.	triceps	flexion
D.	deltoid	abduction

15. How does a first class lever differ from a third class lever in the body?

	In the middle of a first class lever	**In the middle of a third class lever**
A.	fulcrum	effort
B.	load	fulcrum
C.	fulcrum	load
D.	effort	fulcrum

16. How is the flight of a golf ball affected when it is hit with backspin?

A. It will tend to move to the right as it moves through the air

B. It will tend to lift up and hold its flight path as it moves through the air

C. It will tend to move to the left as it moves through the air

D. It will tend to drop more rapidly than normal as it moves through the air

17. Which correctly identifies an open and a closed skill?

	Open	**Closed**
A.	Receiving a serve in badminton	Taking a penalty kick in soccer
B.	Passing a ball while on the run	Surfing along a wave
C.	Putting a golf ball towards the hole	Riding a horse in a field
D.	Cycling on an exercise machine	Hitting a forehand shot in tennis

18. Which is an example of an exteroceptor being used by the body?

A. Sensory information received from the inner ear while performing a somersault.

B. Chemoreceptor in an artery detecting the chemical changes in the blood.

C. The pressure on the hand as a person holds onto a bicycle handlebar.

D. Sensory information received from muscles that detect limb movement when catching a ball.

19. A coach trains their team to use a number and letter sequence for a penalty move. Which type of memory improvement technique is being used?

A. Chunking

B. Coding

C. Clarity

D. Organization

20. What type of skill transfer occurs when a soccer player performs kicking drills as part of their warm-up before a big match?

A. Principles to skill

B. Skill to skill

C. Practice to performance

D. Abilities to skill

21. A coach plans training sessions with periods of work and short rest breaks in between. Which type of practice is this?

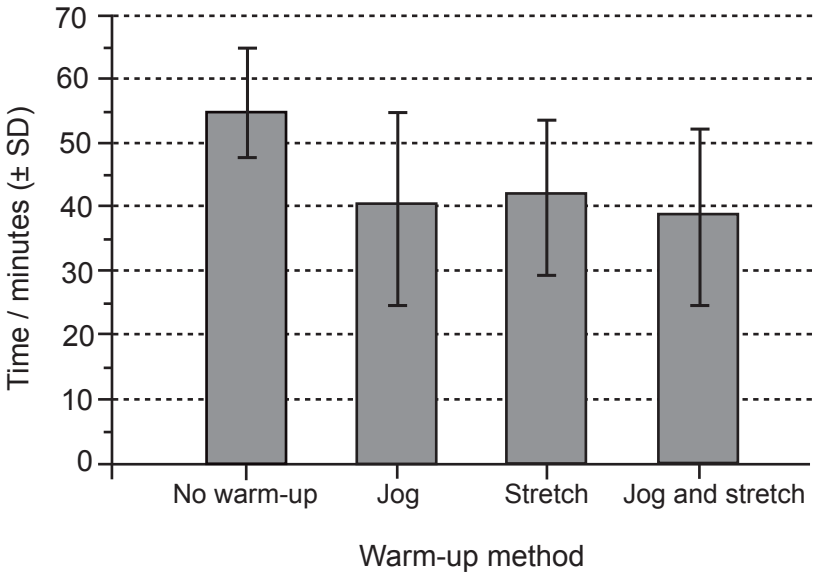
A. Massed

B. Drill

C. Variable

D. Distributed

22. The graph shows athletes' mean 10 km trial times following four different warm-up methods. Which method resulted in the smallest variation in trial times?



A. No warm-up

B. Jog only

C. Stretch only

D. Jog and stretch

23. Which defines randomization?

A. The order of treatments for an experiment is arranged to ensure that no carry over effect is seen in the results.

B. The dependent variable of an experiment is measured randomly.

C. A substance that in every way appears to be the treatment substance is used in an experiment, but it has no known effect.

D. The subject and the experimenter are randomly aware of the treatment being administered.

24. Which is considered a limitation of a maximal fitness test?

A. Participants are typically able to perform repeats of the task more quickly

B. It is very stressful on participants

C. It is not strongly correlated to true values of performance

D. Test accuracy is not very strong

25. What component of fitness is described as ‘the ability to use your muscular strength quickly’?

A. Muscular strength

B. Muscular speed

C. Muscular power

D. Muscular endurance

26. Which is correct with regard to skin?

A. Adipose tissue lies between the dermis and the epidermis

B. Epidermis is the outermost layer of the skin

C. The base of the sweat gland is embedded below the fat layer

D. Dermis lies above the epidermis

27. Which lobe of the brain is primarily responsible for visual processing and interpretation?

A. Temporal

B. Parietal

C. Frontal

D. Occipital

28. Which endocrine organ is found in the neck?

A. Pituitary gland

B. Pineal gland

C. Thyroid gland

D. Adrenal gland

29. Which hormones are released by the pancreas?

A. Glucagon and insulin

B. Glucagon and adrenalin

C. Glycogen and insulin

D. Glycogen and adrenalin

30. Which of the following would be considered an indication of peripheral fatigue?

A. An increase in creatine phosphate stores due to training

B. A reduction in a person's vertical jump height after repeated trials

C. A reduction in the levels of lactate and hydrogen ions in the blood

D. An increase in calcium ion availability for release

31. Which of the activities are correctly classified in terms of their exercise intensity?

	High intensity	**Endurance**
A.	30 minute row	Swimming 2 km
B.	Short sprints	Plyometric exercises
C.	Flexibility training	Swimming 25 m at 100 %
D.	Plyometric exercises	Jogging 5 km

32. Which correctly describes the static and dynamic friction experienced by the bobsled as the team pushes off at the start but before the bobsled begins to move?

A. The static friction is equal to the dynamic friction.

B. The static friction is larger than the dynamic friction.

C. The static friction is smaller than the dynamic friction.

D. The static friction stays the same and the dynamic friction gradually increases.

33. Which force(s) act to slow down a runner as they accelerate out of the blocks at the start of a 100 m sprint?

I. Air resistance

II. Ground reaction force

III. Push force

A. I only

B. I and II only

C. II and III only

D. I, II and III

34. Which is a feature of non-linear pedagogy in sports coaching?

A. It helps to develop the athlete's creative problem-solving processes.

B. The coach dictates what is to be learnt in a training session.

C. The coach has full responsibility for when and how learning will occur in each session.

D. The athlete's learning is very content focused.

35. A coach records shooting position on the court in a basketball game. What type of notation system is being used?

A. Frequency table

B. Flow chart

C. Scattergram

D. Sequential system

36. What does a football coach use performance analysis software (e.g. Prozone) for?

A. To review decisions made by the umpire

B. To provide feedback on an athlete's sleep patterns

C. To determine the nutritional intake of an athlete

D. To determine the speed and fitness level of an athlete

37. Which statements about genotype and phenotype are correct?

	Genotype	**Phenotype**
A.	The genetic makeup of an athlete	An athlete's arm span
B.	The physical expression of an athlete's genetic material	The genetic code of a cell
C.	Genetic characteristics can be influenced by an athlete's environment	How likely a characteristic is to be expressed by a person
D.	The percentage of fast twitch muscle fibres in an athlete's gastrocnemius muscle	The expression of a characteristic can be influenced by an athlete's parents

38. Which are considered to be an environmental influence on an athlete's characteristics?

I. An athlete's lung capacity

II. An athlete's training programme

III. An athlete's nutritional intake

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

39. Which is a chemical mechanism that the body uses to inhibit an infectious agent?

A. The production of B lymphocyte cells

B. Localized inflammation

C. The formation of a blood clot

D. The alkaline or acidic conditions found in different bodily fluids

40. Which are potential effects of intense training which impact the immune system for an elite athlete?

I. Tissue inflammation
II. Reduced resting heart rate
III. Increased levels of cortisol

A. I and II only

B. I and III only

C. II and III only

D. I, II and III