Diploma Programme
Programme du diplôme
Programa del Diploma

Sports, exercise and health science
Higher level
Paper 1

Friday 4 November 2022 (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]**.

8822 – 6601

16 pages

1. Which bone is correctly categorized?

	Bone	Axial or appendicular	Anatomical function
A.	sacral	axial	protection
B.	phalanges	axial	movement
C.	ribs	appendicular	movement
D.	ulna	appendicular	protection

2. Which anatomical term describes the location of the radius in relation to the humerus?

A. Anterior

B. Distal

C. Proximal

D. Lateral

3. Folds in the surface of the nasal passageway increase its surface area. Which is a function of the folds in the conducting airways?

A. To provide a low resistance pathway for airflow

B. To warm and moisten airflow

C. To reduce defence against airborne chemicals

D. To increase the rate of airflow

4. What regulates the rate and depth of ventilation when an athlete starts to exercise?

A. An increase in blood pH

B. A decrease in blood pH

C. A decrease in blood CO_2 level

D. An increase in blood O_2 level

5. A healthy athlete is at sea level, at a comfortable temperature in a low-humidity environment. Which condition results in the lowest saturation of hemoglobin?

A. Hemoglobin passing muscle cells as they are contracting

B. Hemoglobin passing muscle cells that are at rest

C. Hemoglobin in blood with a pH above normal blood pH

D. Hemoglobin in blood that is below normal body temperature

6. Which component of the blood has a nucleus?

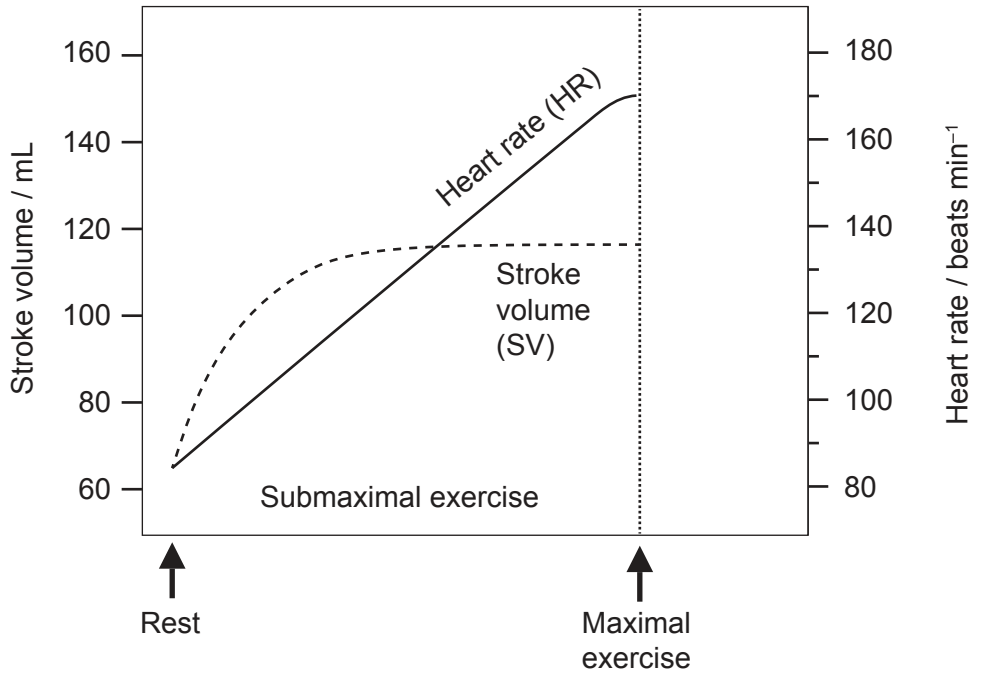
A. Plasma

B. Leucocyte

C. Erythrocyte

D. Platelet (thrombocyte)

7. The graph shows the changes in heart rate and stroke volume as exercise intensity increases.



Which statement best describes the effect on cardiac output as an individual reaches maximal exercise?

A. The increase in cardiac output is due solely to increased stroke volume.

B. Cardiac output remains unchanged due to increased heart rate.

C. The increase in cardiac output is due solely to increased heart rate.

D. Cardiac output remains unchanged due to constant stroke volume.

8. Which combination categorizes macro- and micronutrients correctly?

	Macronutrient	**Micronutrient**
A.	Lipids	Water
B.	Vitamins	Proteins
C.	Lipids	Vitamins
D.	Water	Proteins

9. Which is one characteristic of non-essential amino acids?

A. They are not required for essential bodily processes.

B. They are required from a healthy diet.

C. They can recycle nitrogen from a healthy diet.

D. They can be synthesized by the human body.

10. Which process is represented by the breakdown of sugar in the absence of oxygen?

A. Anaerobic anabolism

B. Aerobic anabolism

C. Anaerobic catabolism

D. Aerobic catabolism

11. Which metabolic process produces the greatest ATP yield?

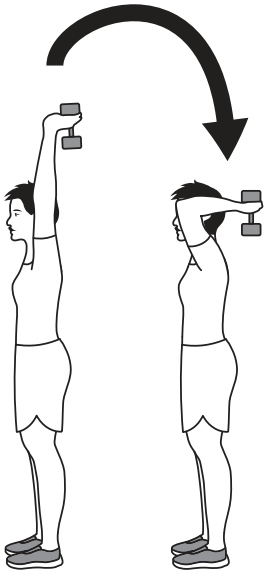
A. ATP–CP system

B. Anaerobic glycolysis

C. Krebs cycle

D. Electron transport chain

12. Which contraction occurs in the triceps during the lowering phase of a tricep extension?



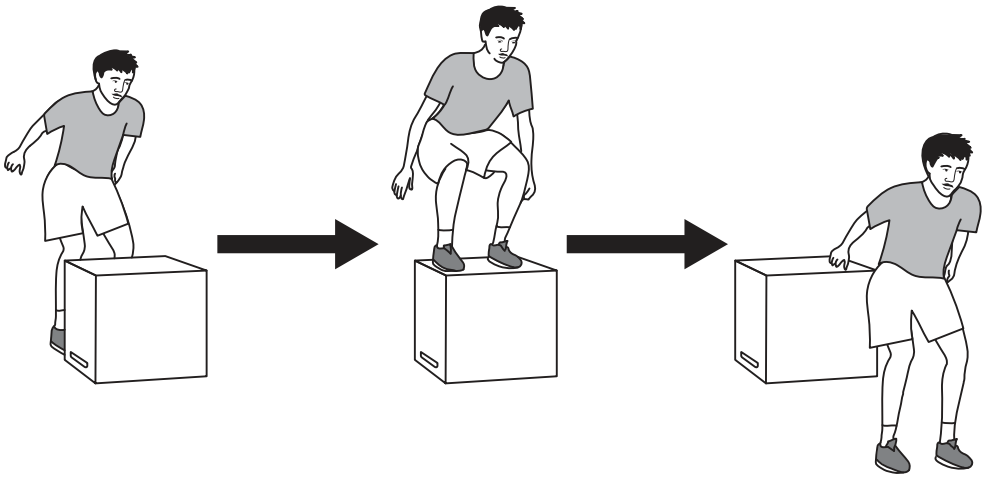
A. Isometric

B. Isokinetic

C. Eccentric

D. Concentric

13. The diagram shows a box jump. Which motion during a box jump is likely to result in the greatest DOMS symptoms?



A. Flexion of the knee during the landing

B. Extension of the knee during the jump

C. Flexion of the hip during the jump

D. Extension of the hip during the landing

14. Which action represents a second-class lever?

A. Leg action kicking a ball

B. Elbow action in overhead throw in soccer

C. Ankle movement of a basketball player shooting

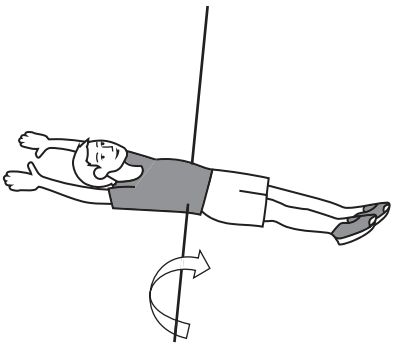
D. Forearm movement when playing a ground shot in tennis

15. The diagrams show a gymnast somersaulting. In which position does the gymnast experience the greatest moment of inertia?

A.

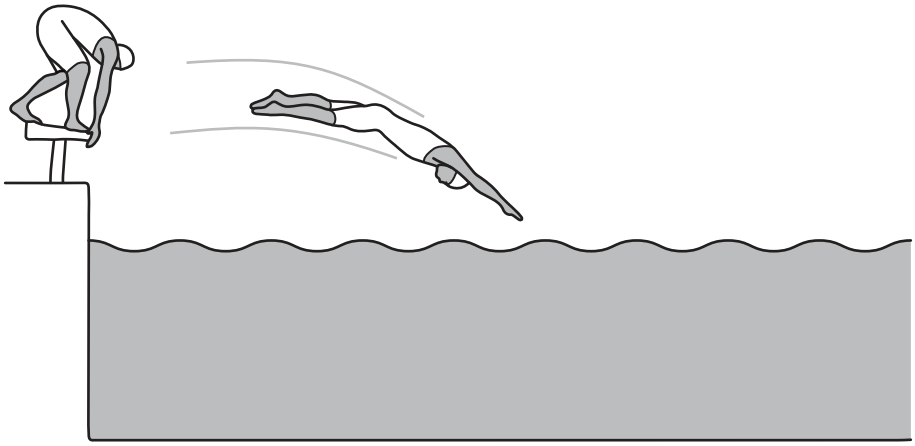
B.

C.



D.

16. At the start of a race, a swimmer dives off a raised starting block rather than from the side of the pool. For exactly the same dive, what effect does this have?



A. The swimmer will enter the water at a faster speed.

B. The swimmer will enter the water further from the starting blocks.

C. The swimmer will enter the water closer to the starting blocks.

D. The swimmer will enter the water at the same entry point.

17. What is the consistent production of goal-oriented movements, which are learned and specific to the task?

A. Skill

B. Ability

C. Proficiency

D. Performance

18. Which description represents the golfer's technique?

A. The golfer's club selection for the next shot

B. The gross body coordination a golfer requires during the swing

C. The pattern of an individual golfer's swing

D. A golfer planning their shot on the green

19. Which is monitored by an interoceptor?

A. Taste

B. Blood pressure

C. Pain

D. Limb location

20. Which transfer occurs when a left-handed tennis player learns to hit with their right hand?

A. Skill to skill

B. Abilities to skill

C. Stage to stage

D. Bilateral

21. A cricket player records their bowling practice. They stop to review the video and then return to practice their technique with the new feedback. What type of practice is this?

A. Distributed

B. Massed

C. Variable

D. Mental

22. Which describes the coefficient of variation?

A. The spread of values from the mean within a normal distribution.

B. Graphical representation of the variability of data.

C. Statistical relationship between two variables.

D. Ratio of the standard deviation to the mean expressed as a percentage.

23. A scientific study performed a correlation on two variables, velocity (*V*) and agility (*A*) and determined that r=0.91. Which correctly describes the variables?

A. Variable *A* causes the changes observed in variable *V*.

B. Variable *V* causes the changes observed in variable *A*.

C. There is a strong relationship between variables *A* and *V*.

D. There is a weak relationship between variables *A* and *V*.

24. Two coaches have been collecting data on their swimming squads. Which statement demonstrates the reliability of data collection?

A. The coaches record similar findings for a 15 m sprint test to compare the squads' start technique.

B. The coaches assess the VO_2max of the swimmers using a flume (water treadmill).

C. The coaches set the swimming ergometer to a standard scale.

D. The coaches collect endurance data for a 10-minute swim.

25. A weightlifter stops training for three months due to injury, which results in muscle atrophy. Which principle of training describes this period of time?

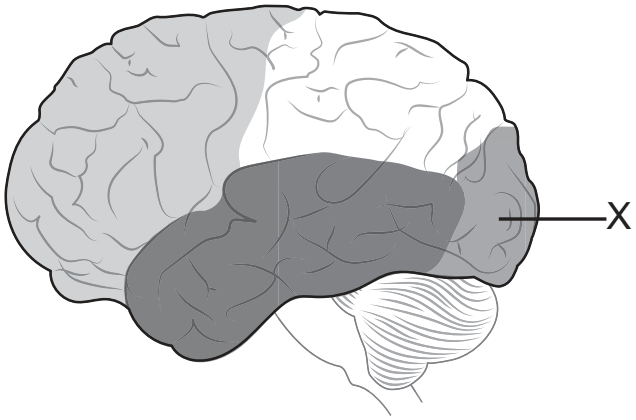
A. Reversibility

B. Progression

C. Overload

D. Variety

26. The diagram shows the brain. What is labelled X?



A. Frontal lobe

B. Parietal lobe

C. Temporal lobe

D. Occipital lobe

27. Which lobe of the brain processes the sound of the crowd cheering during a soccer game?

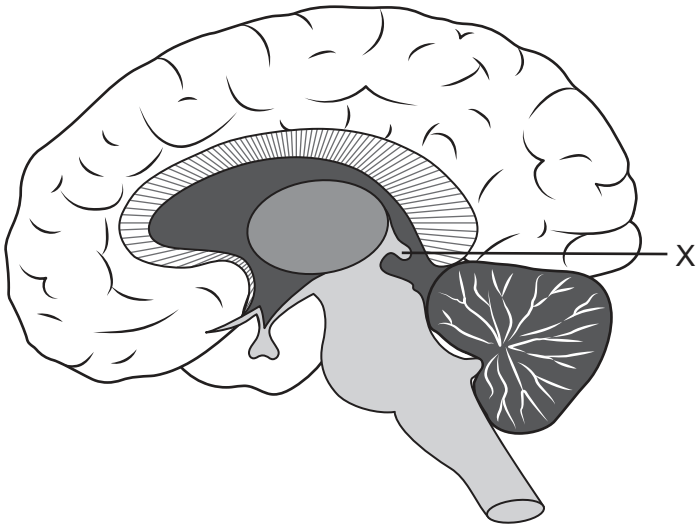
A. Frontal lobe

B. Temporal lobe

C. Limbic lobe

D. Occipital lobe

28. The diagram shows a cross section through the brain. What is labelled X?



A. Pineal gland

B. Pituitary gland

C. Adrenal gland

D. Hypothalamus

29. What regulates circulating hormones?

I. Signals from the nervous system

II. Changes in blood composition, such as glucose levels

III. Other endocrine glands

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

30. Which type of fatigue is caused by impaired function of the brain and develops during prolonged exercise?

A. Peripheral fatigue

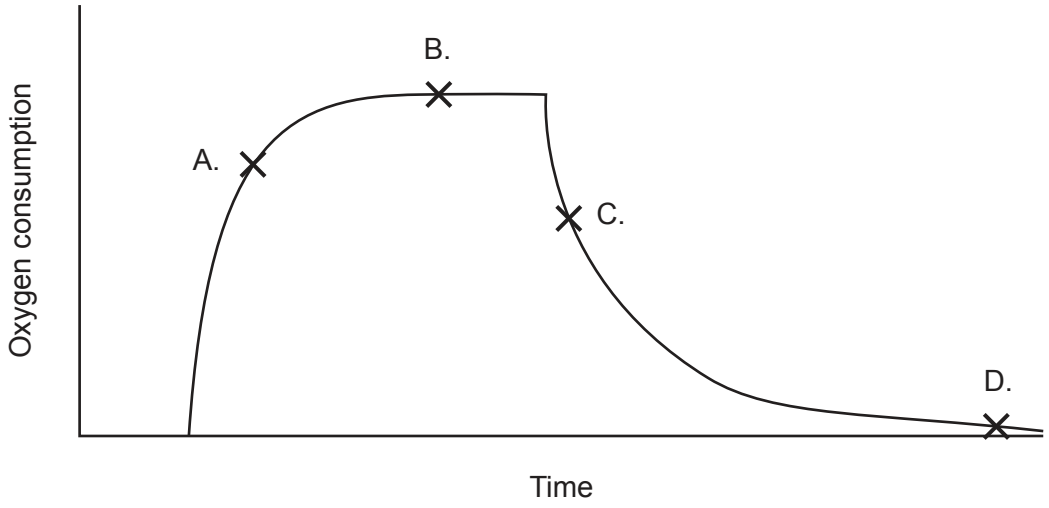
B. Skeletal muscle fatigue

C. Central fatigue

D. Hormone receptor fatigue

31. The graph shows oxygen consumption before, during and after a training session.

Which represents the predominant phase of restoration of muscle creatine phosphate stores?



32. Climbers put chalk on their hands to increase the grip between their fingers and the climbing surface. The chalk absorbs body oils and sweat. Which describes the changes in friction caused by the chalk?

A. The chalk increases the coefficient of static friction.

B. The chalk increases the normal force of the climber.

C. The chalk decreases the coefficient of static friction.

D. The chalk decreases the coefficient of dynamic friction.

33. The diagram shows a cyclist lowering their body close to the bike frame.

Which type of drag is altered by this cycling position?

A. Wave drag

B. Form drag

C. Dynamic drag

D. Surface drag

34. What is the reason for using notational analysis in sports?

I. To provide quantitative analysis consistently and reliably

II. To provide an objective way of recording performance

III. To provide quantitative and qualitative feedback

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

35. A soccer coach is studying the performance of their squad. Which is an example of tactical evaluation?

A. The coach uses a video to assess the velocity of a ball as it is kicked.

B. The coach uses GPS tracking software to monitor the distance run during a game.

C. The coach uses a scattergram to record where the squad loses possession.

D. The coach records multistage fitness testing data for the squad.

36. A coach monitors the types of feedback provided to athletes during a practice session. Which notation system would be most appropriate for this analysis?

A. Scattergram

B. Sequential systems

C. Motion tracking

D. Frequency table

37. Which term is defined correctly?

	Term	Definition
A.	Phenotype	The 23 pairs of non-sex chromosomes
B.	Genotype	The expressed physical characteristics
C.	Genes	Sections of DNA found on chromosomes
D.	Gametes	An individual's collection of genes

38. An athlete wants to improve their performance to become an elite high jumper. Which factors are predominantly environmental?

I. A history of plyometric training

II. A tall athlete with a low body mass

III. A balanced diet

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

39. Which is the main immune response that leads to the symptoms of DOMS?

A. Chemical secretions

B. Mucosal secretions

C. Inflammation

D. Leucocyte production

40. Which are effective strategies for minimizing the risk of infection in athletes?

I. Maintain oral hygiene
II. Reduce recovery time
III. Ensure sufficient sleep

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

References: