

SUPERVISOR TO ATTACH
PROCESSING LABEL HERE

--	--	--	--	--	--	--	--	--

Write your **student number** in the boxes above.

Letter

Physical Education

Question and Answer Book

VCE Examination – Day Date Month Year

- Reading time is **15 minutes**: — to —
- Writing time is **2 hours**: — to —

Materials supplied

- Question and Answer Book of 36 pages
- Multiple-Choice Answer Sheet

Instructions

- Follow the instructions on your Multiple-Choice Answer Sheet.
- At the end of the examination, place your Multiple-Choice Answer Sheet inside the front cover of this book.

Students are **not** permitted to bring mobile phones and/or any unauthorised electronic devices into the examination room.

Contents	pages
Section A (20 questions, 20 marks)	2–9
Section B (11 questions, 90 marks)	10–33

Section A

Instructions

- Answer **all** questions in pencil on your Multiple-Choice Answer Sheet.
 - Choose the response that is **correct** or that **best answers** the question.
 - A correct answer scores 1; an incorrect answer scores 0.
 - Marks will **not** be deducted for incorrect answers.
 - No marks will be given if more than one answer is completed for any question.
 - Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.
-

Question 1

During a period of oxygen deficit

- A. oxygen supply is less than oxygen demand.
- B. oxygen demand is less than oxygen supply.
- C. oxygen supply is equal to oxygen demand.
- D. lactate production is equal to lactate removal.

Question 2

From a psychological perspective, why would a VO_2 max. test that measures aerobic power be appropriate for a 17-year-old high school student who plays state-level netball?

- A. They can obtain accurate results highlighting their maximum rate of aerobic energy production.
- B. They are likely to have the mental toughness to complete the test to exhaustion.
- C. They are likely to have the physical capabilities to complete the test to exhaustion.
- D. They are likely to have the resources and funding to undertake the test.

Question 3

The sound a tennis ball makes when being struck by a racquet gives the tennis player what type of feedback?

- A. knowledge of results
- B. knowledge of performance
- C. augmented
- D. intrinsic

Use the following information to answer Questions 4 and 5.

Speed (km/h)	Blood lactate (mmol/L)	Heart rate (bpm)
10	2	110
11	2	122
12	2	130
13	2	141
14	3.5	152
15	4.0	163
16	4.5	171
17	5	180
18	5.5	192
19	6	199

The table above presents blood lactate concentration data obtained from a 21-year-old soccer player during an incremental treadmill test to exhaustion. The speed was increased by 1 km/h every minute.

Question 4

The data presented in the heart rate column can best inform which parameter as part of an activity analysis?

- A. muscle groups
- B. skill frequencies
- C. energy systems
- D. fitness components

Question 5

What would be the most likely fatigue mechanism experienced by the soccer player during the incremental treadmill test?

- A. creatine phosphate (CP) depletion
- B. glycogen depletion
- C. accumulation of metabolic by-products
- D. elevated body temperature

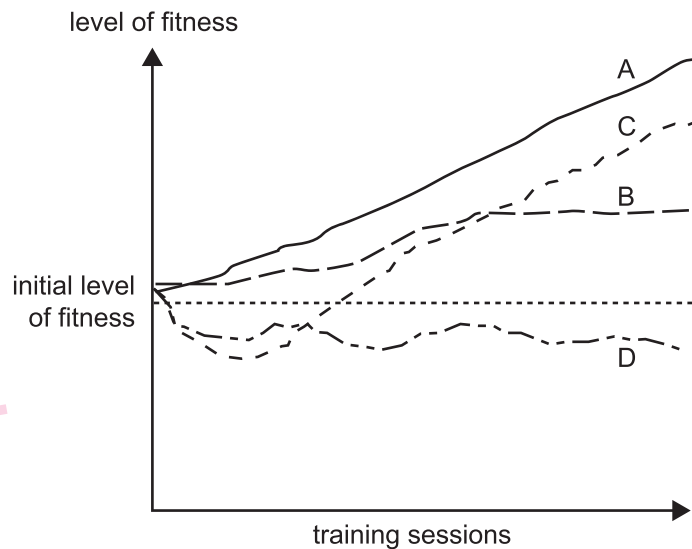
Question 6

The following is a biomechanical formula.

$$p = mv$$

What does the 'p' represent?

- A. velocity
- B. momentum
- C. inertia
- D. impulse

Question 7

Which one of the following statements best describes **line D** on the graph above?

- A. The initial work rate was correct and progression was added correctly to achieve the best possible results.
- B. The initial work rate was too difficult but over time the body adapted, and then progression was added correctly to improve fitness.
- C. The initial work rate was difficult, then the body adapted, which resulted in fitness gains, but from that time onwards no progression was applied.
- D. The initial work rate was too difficult and when the body started to adapt further progression was applied, resulting in an overall decrease in fitness.

Question 8

When coaching a performer in the cognitive stage of learning a new skill, what is the best method for providing feedback and instruction?

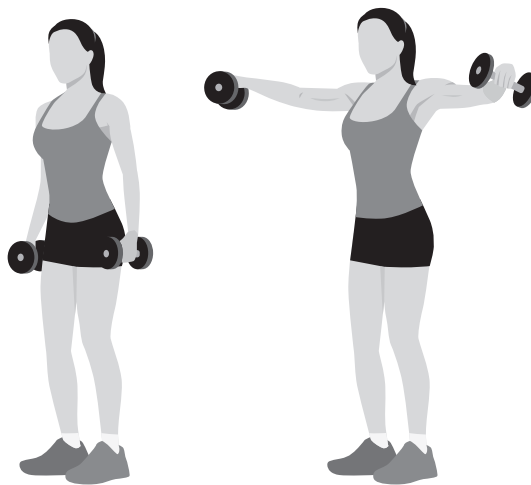
- A. The coach should provide complex feedback with multiple teaching points to ensure comprehensive understanding.
- B. The coach should limit the number of demonstrations but give detailed verbal instruction.
- C. The coach should keep feedback simple, provide clear and concise instruction, and offer repeated demonstrations.
- D. Feedback should focus on the success of performance without offering strategies for error correction.

Question 9

During the Australian Open tennis tournament, coaches are now allowed to be courtside with players during a match. A coach is seen telling their player to focus on the ball and ignore the noise from their opponent and the crowd.

This is an example of a strategy to improve which psychological skill?

- A. motivation
- B. confidence
- C. concentration
- D. arousal levels

Question 10

Source: Lio putra/Shutterstock.com

SAMPLE

Sarah is completing a lateral raise using dumbbells. She finds it difficult to complete this exercise without bending her elbows.

When she bends her elbows to lift the weight, Sarah is

- A. decreasing the resistance arm.
- B. decreasing the force arm.
- C. increasing moment of inertia.
- D. decreasing her stability.

Question 11

Which of the following lists of foods would a marathon runner likely select to carbohydrate-load?

- A. steak, milk, raw nuts, honey
- B. legumes, avocados, eggs, bananas
- C. cereals, pasta, fruit drink, garlic bread
- D. salad sandwich, chocolate, strawberries, sports drink

Use the following image to answer Questions 12 and 13.



Source: Anton Vierietin/Shutterstock.com

Question 12

Which of the following is **not** a factor that influences flexibility?

- A. sex
- B. type of joint
- C. type of muscle fibre
- D. training

Question 13

Rhythmic gymnasts perform intense three-minute routines.

Identify the energy system that would most contribute to ATP resynthesis in a rhythmic gymnastic routine.

- A. ATP-CP
- B. anaerobic glycolysis
- C. aerobic
- D. aerobic lipolysis

Question 14



single leg hops

What type of training is shown in the image above?

- A. resistance training
- B. plyometric training
- C. continuous training
- D. interval training

Question 15

Hot Pilates is a type of Pilates workout that is performed on a mat in a heated room. The heat in the room is typically set to 32–35 °C.

When training in very hot temperatures, an athlete's body will experience a decrease in

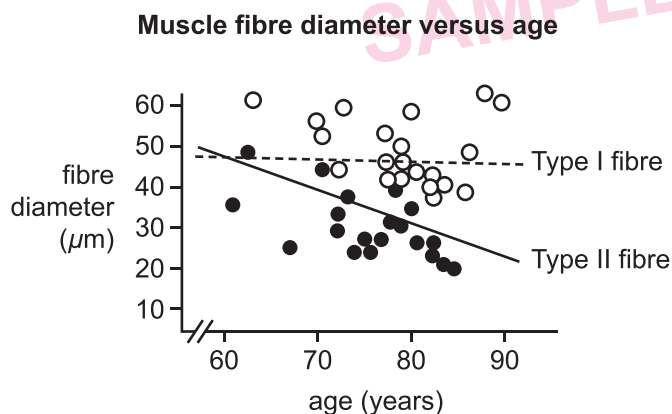
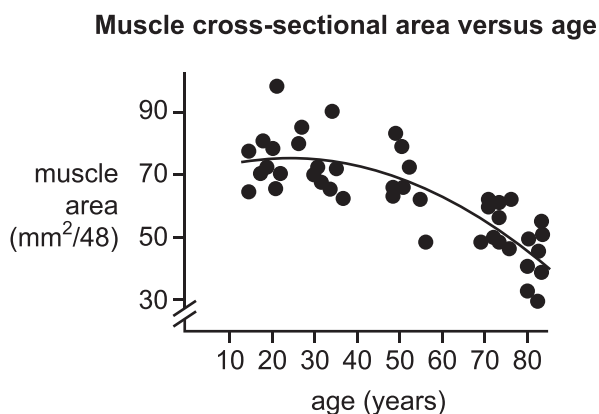
- A. heart rate.
- B. blood lactate.
- C. blood volume.
- D. vasodilation to skin.

Question 16

An under-14s football coach is about to conduct post-training fitness testing with their team of 20 players.

Which statement best describes how the coach could increase the validity of results?

- A. Ensure that an aerobic power test is undertaken at the end of the day to avoid fatigue.
- B. Select a fitness test that all players in the team can complete at the same time.
- C. Follow the same testing schedule from pretesting to post-testing.
- D. Ensure use of a recognised, standardised fitness test.

Question 17

Source: Adapted from JF Signorile, *Bending the Aging Curve: The Complete Exercise Guide for Older Adults*, Human Kinetics, Champaign, pp. 6 and 7.

Analysing the graphs above, what factors of muscular strength are displayed?

- A. muscle cross-sectional area, age
- B. muscle fibre diameter, age
- C. muscle cross-sectional area, muscle fibre diameter
- D. muscle cross-sectional area, muscle fibre diameter, age

Question 18

Max Verstappen is a Formula 1 racing car driver.

Identify the sociocultural factor that may have influenced the development of his skills from a young age.

- A. motivation
- B. family
- C. reaction time
- D. body composition

Question 19

The following information is taken from Week 1 of a short-interval training session.

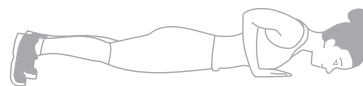
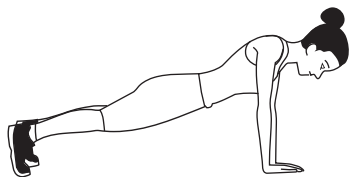
Sets	Repetitions	Time	Recovery time
2	8	40 seconds	3 minutes

Select the most appropriate ways to apply the principle of progression to the short-interval training session for Week 4.

	Sets	Repetitions	Time	Recovery time
A.	2	10	40	3 minutes
B.	2	9	40	3 minutes
C.	2	9	35	3 minutes
D.	2	10	34	3 minutes

Question 20

Melanie wants to improve the muscular strength of her pectorals and triceps but cannot do the required repetitions because the original exercise (the push-up) is too difficult.

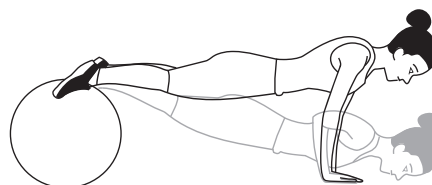


Which one of the following shows an appropriate modification of the exercise that will enable Melanie to complete the required repetitions and still develop the muscular strength of her pectorals and triceps?

A.



B.



C.



D.



Do not write in this area.

Section B

Instructions

- Answer **all** questions in the spaces provided.
- Write your responses in English.
- Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.

Question 1 (7 marks)

Nicola Olyslagers won a silver medal in the high jump at the Paris 2024 Olympics. After each of her jumps she was seen writing in her training diary.



Source: Victor Velter/Shutterstock.com

- a. Name **one** physiological, **one** psychological and **one** sociological example of training data that Nicola could include in her training diary.

3 marks

Physiological	Psychological	Sociological

b. Nicola tracks her sleep patterns every night.

Explain how inadequate sleep could affect her psychological performance.

2 marks

c. Describe **one** other strategy Nicola could use to track her progress in high jump training.

2 marks

SAMPLE

Question 2 (8 marks)

Baseball is a game played worldwide. In baseball, a pitcher will pitch to a batter, who needs to hit the ball with a bat, and then run around bases. A popular modified game of baseball is Tee-ball, in which players hit the ball off a tee instead of having it thrown to them by a pitcher, as shown in the image below.



Source: Lost_in_the_Midwest/Shutterstock.com

- a. Tee-ballers will often use shorter and lighter bats.

Explain how this will improve performance by making reference to moment of inertia.

3 marks

Do not write in this area.

Question 3 (6 marks)

Ultramarathons are footrace events that are longer than a traditional marathon. Single-day ultramarathons can range from 50 km to 160 km, but there are longer races run over several days, with breaks for sleep.

- a. Ultramarathon runners require carbohydrate consumption while running each day and in recovery.

Use the table below to outline the different roles that carbohydrates play during the race and in recovery.

2 marks

Part of the race	Role of carbohydrates
During the race	
Recovery	

- b. In the week leading up to an ultramarathon, runners will manipulate their training and consume more carbohydrates than they typically would during their training season.

Using the nutritional strategy and training principle outlined above, describe how the athlete manipulates their training. Explain the benefits of combining these strategies in the preparation for an ultramarathon.

4 marks

Do not write in this area.

Do not write in this area.

This page is blank.

SAMPLE

Question 4 (15 marks)

A coach used direct observation to collect data for an elite squash player in order to complete an activity analysis.

The data collected included movement patterns, number of movements, number of shots played and heart rate.

This data is shown in Figures 1–6.

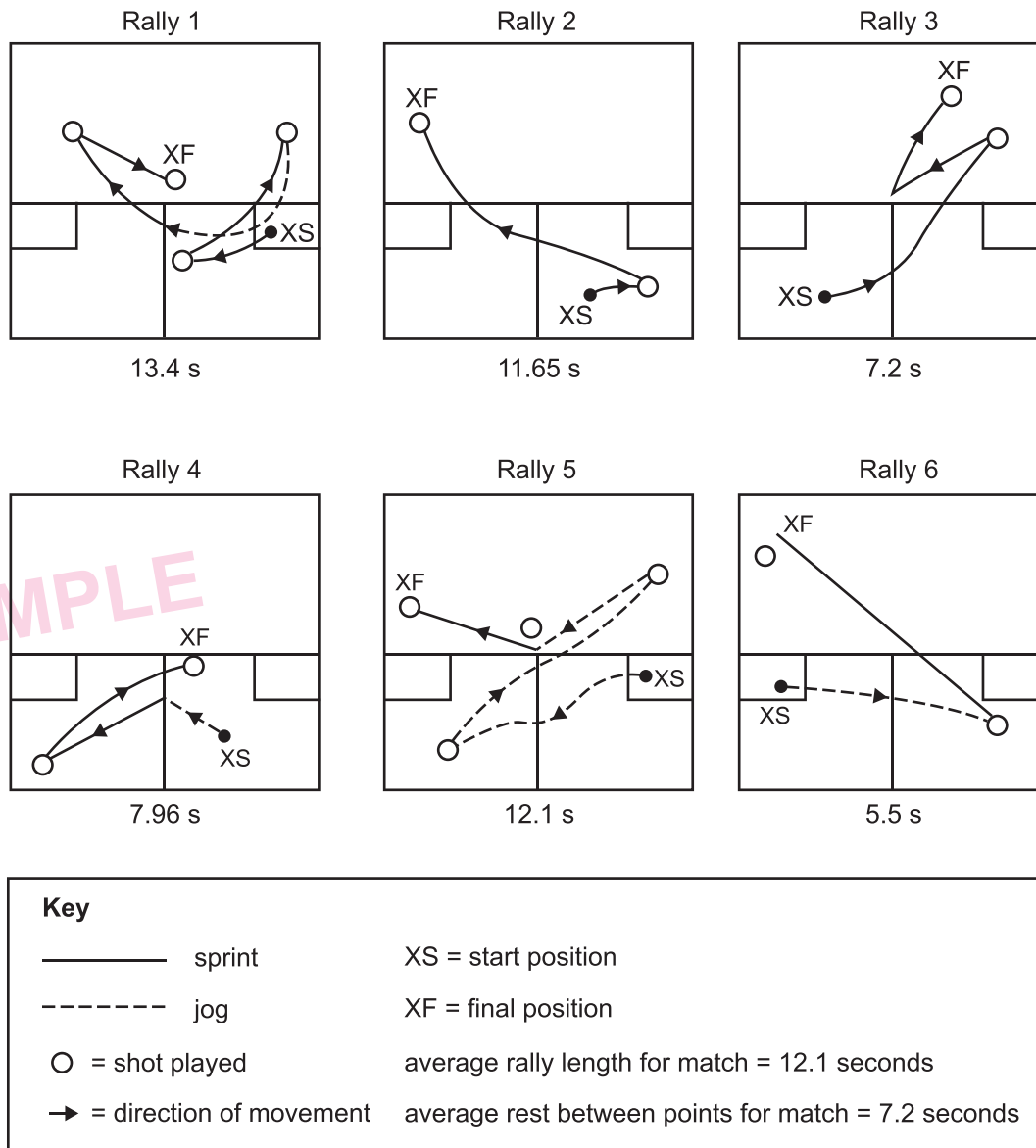


Figure 1. Movement patterns

	Distance (metres)			Total number
	<5	5–10	>10	
sprint	219	56	0	275
jog	195	31	2	228
walk	53	3	0	56
Total	467	90	2	559

Figure 2. Number of sprints, jogs, walks

	Direction			Total for match
	Forward	Backward	Sideways	
Total for match	170	116	228	514

Figure 3. Number of times player ran forward, backward and sideways

	Direction of stretch				Total number of stretches
	Forehand side	Backhand side	Lunge	Reach	
Total	75	91	67	21	254

Figure 4. Number of times player stretched/lunged for the ball in different directions

	Type of shot played			Total number of shots	
	Serve	Forehand	Backhand		Volley
	56	152	190	64	462

Figure 5. Number of shots played

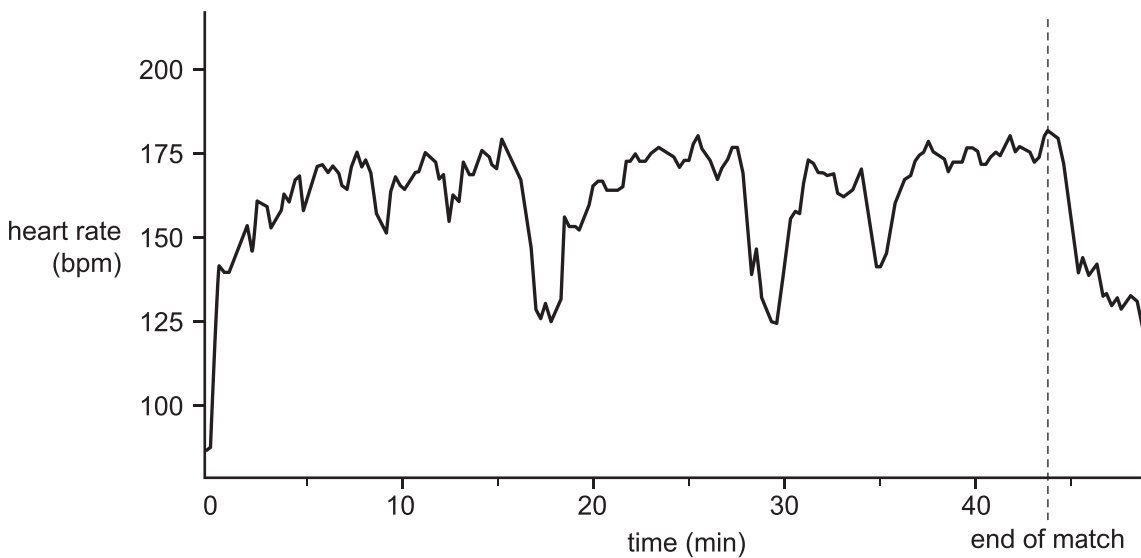


Figure 6. Heart rate of squash player during a 43-minute match

a. i. Shade the period of excess post-exercise oxygen consumption (EPOC) on Figure 6. 1 mark

ii. Describe a suitable physiological recovery that the squash player should complete. 2 marks

SAMPLE

b. Select **one** piece of data. Explain the purpose of the activity analysis that the coach completes for the elite squash player. 3 marks

- c. The coach identified flexibility as an important fitness component following the activity analysis.

Referencing the data, justify the coach's selection.

2 marks

SAMPLE

Do not write in this area.

- d. Following the activity analysis, a student in the class suggested that the elite squash player undertake the trunk flexion (sit-and-reach) test.



Source: Microgen/Shutterstock.com

- i. Consider figures 1–5 on pages 16 and 17. Justify the effectiveness of the trunk flexion test from a physiological perspective.

3 marks

SAMPLE

Do not write in this area.

ii. Using the trunk flexion test as an example, discuss whether a test can provide accurate yet unreliable results.

4 marks

SAMPLE

Do not write in this area.

Question 5 (10 marks)



Source: JO de Londres, 2012 <<https://www.flickr.com/photos/14183788@N00/7671937664>> CC BY 2.0

The 'vault' is a gymnastics skill that requires the gymnast to perform a run up and explosively jump onto an apparatus that is also called a vault. They manipulate their body in the air, completing tricks before landing on the mat.

a. i. Circle which type of skill the vault is:

SAMPLE

- discrete serial continuous

1 mark

ii. Explain your answer to **part a.i.**

1 mark

b. Evaluate the most suitable type of practice (part or whole) that a beginner gymnast could use when learning the gymnastics vault.

4 marks

Do not write in this area.

- c. Explain how a gymnast can execute a successful vault performance by referring to conservation of angular momentum and stability.

4 marks

SAMPLE

Do not write in this area.

Question 7 (5 marks)

During a Super Netball game, play was abandoned after Sasha Glasgow suffered a serious lower-leg fracture, which prevented her from completing any fitness work for her lower body for a significant time.

- a. Explain the principle of detraining by referring to Glasgow’s injury. Describe how her muscle mass and therefore muscular power would be affected by detraining. 2 marks

- b. For her rehabilitation, Glasgow gradually reintroduced activity, starting with low-impact movements. Eventually she began a weight-training program designed by training staff to focus primarily on improving the muscular power in her legs.

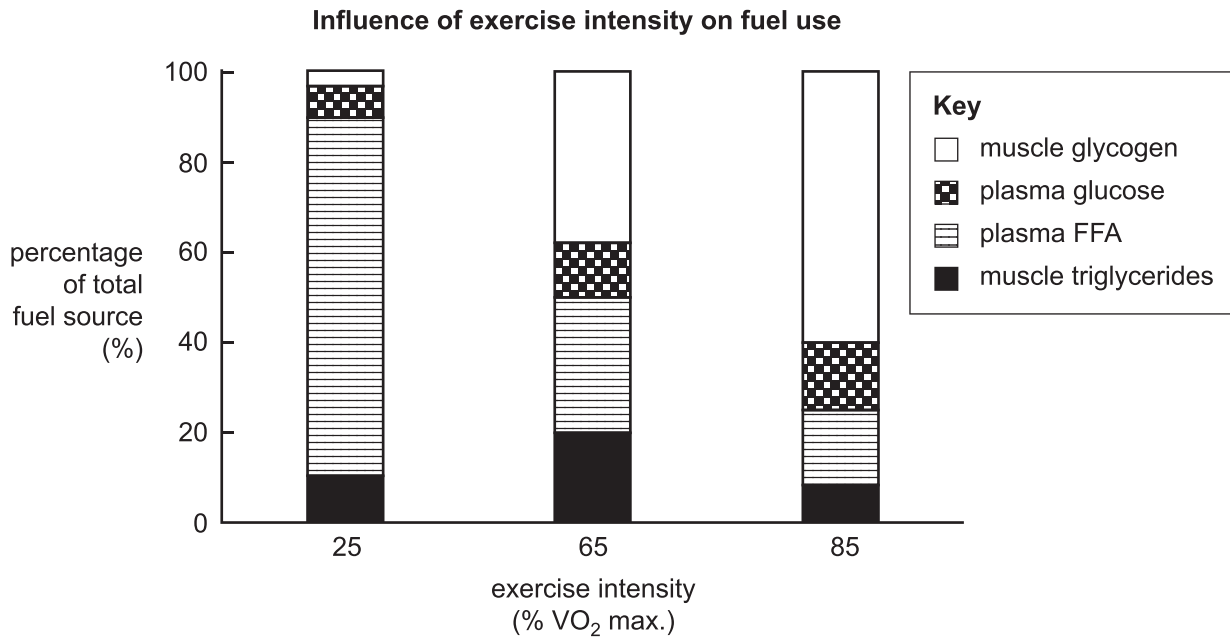
State **one** chronic muscular adaptation and describe the role it plays in improving the speed **or** force of Glasgow’s muscular contractions, and how it improves her netball performance in rehabilitation.

3 marks

SAMPLE

Question 8 (6 marks)

The graph below demonstrates the use of fuel at various intensities when running on a treadmill. This data was taken **prior** to an athlete undertaking an eight-week aerobic training program.



Source: Adpated from SK Powers and ET Howley,
Exercise Physiology: Theory and Application to Fitness and Performance, McGraw Hill Education, New York, 2018

a. Explain why muscle glycogen is the least utilised fuel at 25% VO₂ max.

2 marks

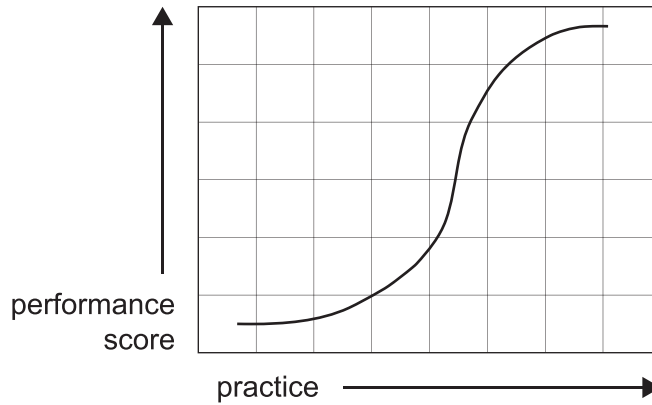
b. Following the eight-week aerobic training program, there was a change in the fuel use of the athlete.

Referencing the appropriate adaptations, discuss the likely changes in fuel contribution at 65% VO₂ max.

4 marks

Question 9 (4 marks)

The following graph demonstrates the learning growth of a young lacrosse player whose coach has used a constraints-based coaching approach.



- a. From the two skill acquisition theories identified below, circle the theory that is demonstrated in the graph.

linear

non-linear

1 mark

- b. Justify your response to **part a** by making reference to constraints-based approaches.

3 marks

SAMPLE

Question 10 (10 marks)

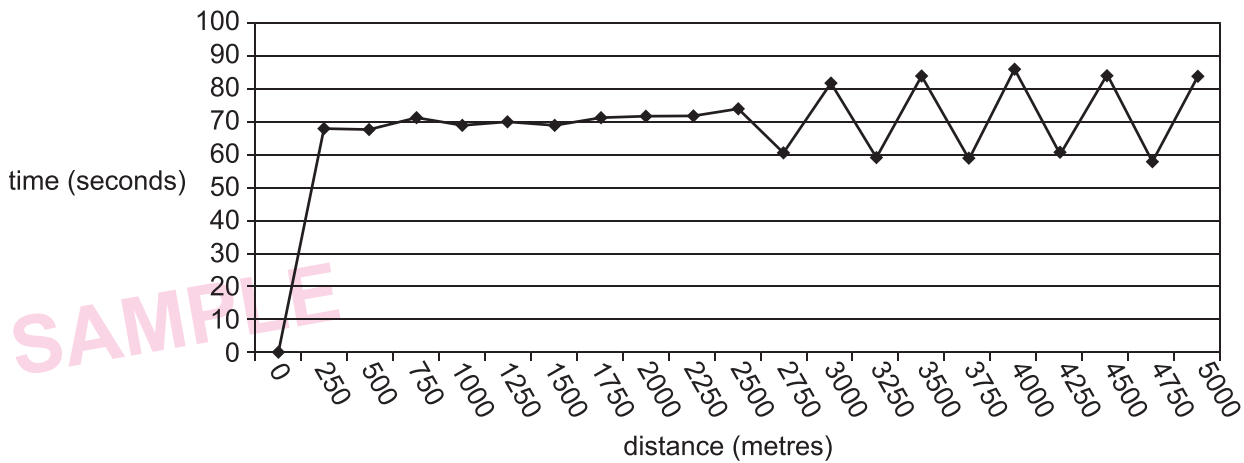
Pia is a 13-year-old who is preparing to compete in a 5 km cross-country event in 12 weeks. Pia begins a training program at the local park. She begins by running two laps at a comfortable pace and gradually increases the number of laps she can complete each week.

- a. State the minimum number of training sessions per week needed to improve Pia's VO_2 max.

1 mark

- b. Two weeks before the event, Pia completed a training session covering a total distance of 5 km and noticed an improvement in her running pace.

The following graph represents the time it took Pia to run each 250 m lap.



Identify **one** possible training method used in this session. Refer to the data in your response.

2 marks

c. i. List **two** possible chronic vascular adaptations that result from aerobic training. 2 marks

ii. Explain how **one** of the chronic adaptations listed in **part c.i** may improve Pia's running performance. 2 marks

d. Pia was debating with Emilia from her class about the benefits of anaerobic training for cross-country runners. Pia believed that anaerobic training would improve her cross-country performance. Emilia disagreed and claimed that it wouldn't. Circle who you think is correct and justify your response. 3 marks

Emilia Pia

SAMPLE

Do not write in this area.

Do not write in this area.

SAMPLE

SAMPLE

Do not write in this area.

Do not write in this area.

SAMPLE

SAMPLE

This page is blank.

Do not write in this area.

Do not write in this area.

This page is blank.

SAMPLE

Answers to multiple-choice questions

Section A

Question	Answer
1	A
2	B
3	D
4	C
5	C
6	B
7	D
8	C
9	C
10	A
11	C
12	C
13	C
14	B
15	C
16	D
17	D
18	B
19	B
20	A

SAMPLE