Neap

Trial Examination 2023

VCE Physical Education Units 3&4

Written Examination

Question and Answer Booklet

Reading time: 15 minutes
Writing time: 2 hours

Student's Name: _____

Teacher's Name: _____

Structure of booklet

Section	*Number of questions*	*Number of questions to be answered*	*Number of marks*
A	15	15	15
B	11	11	105
			Total 120

Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.

Students are NOT permitted to bring into the examination room: blank sheets of paper and/or correction fluid/tape.

No calculator is allowed in this examination.

Materials supplied

Question and answer booklet of 24 pages

Answer sheet for multiple-choice questions

Instructions

Write your **name** and your **teacher's name** in the space provided above on this page, and on the answer sheet for multiple-choice questions.

All written responses must be in English.

At the end of the examination

Place the answer sheet for multiple-choice questions inside the front cover of this booklet.

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

SECTION A – MULTIPLE-CHOICE QUESTIONS

Instructions for Section A

Answer **all** questions in pencil on the answer sheet provided for multiple-choice questions.
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.

Question 1

Which one of the following is characteristic of a discrete skill?

A. no distinct beginning or end point
B. easily defined by a distinct beginning and end point
C. involves the use of small muscles groups and fine touch control
D. predictable and self-paced

Question 2

A snooker player is trying to complete the game by pocketing the black ball.

Which one of the following attention types would the snooker player use while playing her shot?

A. narrow-external focus
B. narrow-internal focus
C. broad-external focus
D. broad-internal focus

Question 3

Which one of the following is an example of intrinsic motivation?

A. receiving a trophy
B. receiving prize money
C. gaining recognition from others
D. enhancing feelings of self-worth

Question 4

Which one of the following is **not** a chronic adaptation of high-intensity interval training (HIIT)?

A. increased myoglobin
B. increased capillarisation
C. decreased rate of glycogen use
D. increased mitochondrial mass

Question 5

Which one of the following is an acute cardiovascular response to increased exercise intensity?

A. increased stroke volume

B. increased tidal volume

C. increased respiratory frequency

D. increased pulmonary diffusion

Question 6

The most likely cause of fatigue for an Olympic 200 m sprinter is

A. thermoregulation.

B. depletion of muscle glycogen.

C. depletion of creatine phosphate stores.

D. accumulation of hydrogen ions (H^+).

Question 7

Which of the following sets, repetitions and loads (% of 1 repetition maximum, or RM) are appropriate to enhance the fitness component?

	Fitness component	Sets	Repetitions	Load (% of 1 RM)
A.	hypertrophy	3–6	15–25	40–60
B.	endurance	3–6	15–25	80–90
C.	strength	3–6	1–12	80–100
D.	power	1–2	3–12	30–70

Question 8

Which of the following correctly matches the training method to the chronic adaptation and fitness component?

	Training method	Chronic adaptation	Fitness component
A.	fartlek	improved motor unit recruitment	muscular endurance
B.	short interval	decreased heart rate at rest	anaerobic capacity
C.	long interval	increased lactate tolerance	aerobic capacity
D.	plyometrics	increase in ATP–CP stores	muscular power

Question 9

The term 'momentum' describes the quantity of motion belonging to a particular body of mass.

Which one of the following is the correct expression for momentum?

A. $\text{momentum } (p) = \dfrac{\text{velocity } (v)}{\text{force } (N)}$

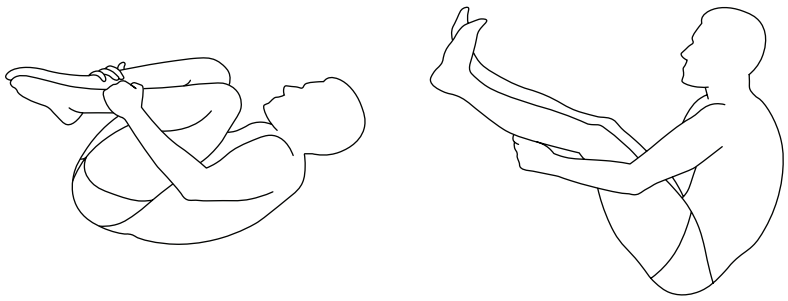
B. $\text{momentum } (p) = \text{force } (N) \times \text{mass (kg)}$

C. $\text{momentum } (p) = \dfrac{\text{mass (kg)}}{\text{velocity } (v)}$

D. $\text{momentum } (p) = \text{mass (kg)} \times \text{velocity } (v)$

Question 10

A diver jumps from a diving platform and completes a series of somersaults in the air before they land in a pool below. The diagram below shows the positions of the diver as they complete the somersaults. In position 1, the diver is tucking up to perform the somersaults in the air and in position 2, the diver has completed the series of somersaults.



position 1 position 2

Which of the following describes what occurs to the diver's angular momentum and moment of inertia as they complete the somersaults?

	Angular momentum	Moment of inertia
A.	increases	decreases
B.	is conserved	decreases
C.	is conserved	is conserved
D.	decreases	increases

Question 11

Sharmilla is a 16-year-old football player and completes a five-kilometre park run on a Saturday morning as part of her pre-season football training. She wears a heart rate monitor and, prior to the run, records a resting heart rate of 64 beats per minute (bpm). At the conclusion of the run, which she completes in a time of 19.02 minutes, Sharmilla records a heart rate of 186 bpm. Five minutes after the run has been completed, Sharmilla notices her heart rate is still raised at 132 bpm.

Sharmilla's body does not return to its original resting heart rate immediately after the run because the body is going through a period

A. of oxygen deficit, where the body's energy is being supplied by the anaerobic pathways.

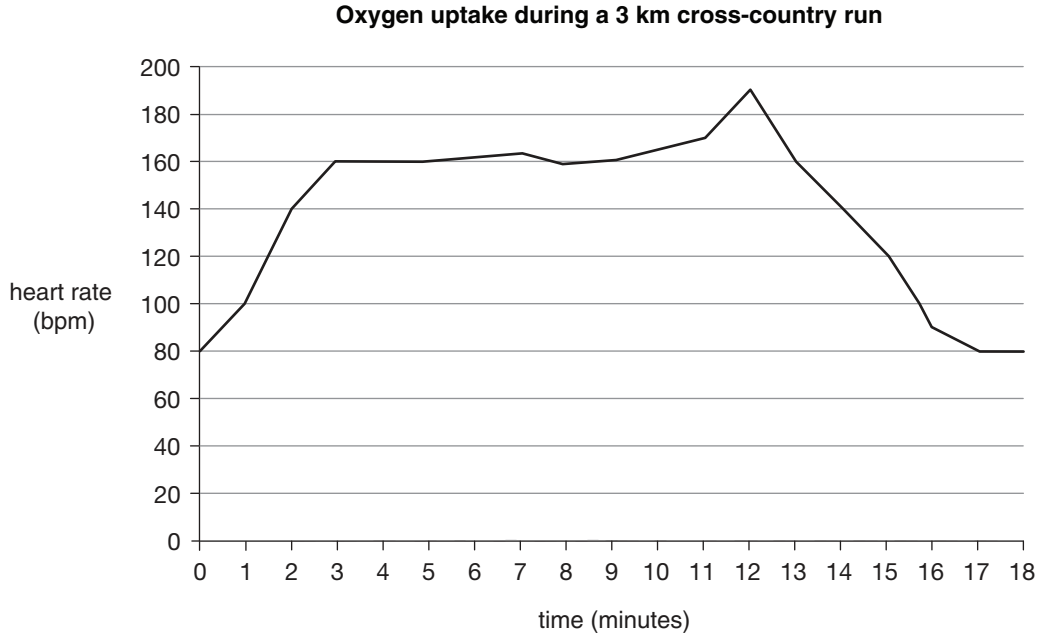
B. of steady state, where glycogen is being oxidised by the anaerobic glycolysis system.

C. of excess post-exercise oxygen consumption, where metabolic by-products are being broken down and oxygen is being replaced in the myoglobin.

D. where cardiac output and respiratory rate are both increasing in order to meet the body's energy demand.

Question 12

The graph below shows the oxygen uptake of a Year 12 Physical Education student who recently competed in a school cross-country running event.



Which one of the following statements about the graph is **incorrect**?

A. Oxygen deficit occurs only once during this race, between 0 and 3 minutes.

B. Steady state was reached at approximately 3 minutes.

C. Excess post-exercise oxygen consumption (EPOC) occurs at approximately 12 minutes.

D. The student's heart rate increases at approximately 11 minutes.

Question 13

Maximum oxygen uptake (VO_2 max) is the maximum amount of oxygen per minute that can be transported to, taken up by and used by the body for energy production.

VO_2 max is a product of cardiac output (Q) and

A. arteriovenous oxygen (a-vO_2) difference.

B. stroke volume (SV).

C. heart rate (HR).

D. ventilation (V).

Question 14

Eliud Kipchoge is a Kenyan long-distance runner who won the 2016 and 2020 Olympic marathons. In 2018, he set the world record in the marathon with a time of 2:01:39 at the Berlin Marathon.

When running marathons, Kipchoge is able to work at higher intensities aerobically due to an increase in

A. lactate tolerance.

B. glycolytic capacity.

C. the number of motor units recruited.

D. mitochondria.

Question 15

Which of the following demonstrates the correct application for high-intensity interval training (HIIT)?

	Frequency (per week)	Intensity	Type	Repetitions	Work period (seconds)	Recovery period (seconds)	Work-to-rest (W : R) ratio
A.	2	90–100% heart rate (HR) max	cycling	8	45	45	1 : 1
B.	3	90–100% HR max	running	5	60	240	1 : 4
C.	3	75–85% HR max	cycling	8	60	30	2 : 1
D.	3	90–100% HR max	rowing	11	30	30	1 : 1

SECTION B

Instructions for Section B

Answer **all** questions in the spaces provided.

Question 1 (14 marks)

Australian rules football can be challenging for younger children to play as they often struggle to bounce, catch, handball and kick the oval-shaped ball. A program called Auskick has been designed with the intention of modifying Australian rules football for younger children and improving their fundamental motor skills, enjoyment of and success in the sport. The Auskick program modifies the game of Australian rules football by using a smaller field size and lighter, softer and rounder footballs, which are easier for younger children to handle.

a. Identify the stage of learning for which the Auskick program is designed. 1 mark

b. Provide **two** characteristics associated with the stage of learning identified in **part a.** 2 marks

c. What type of constraint is being modified in the Auskick program? 1 mark

d. Referring to the Auskick program, explain the difference between implicit learning and explicit learning. 2 marks

e. Identify and explain the type of practice distribution and practice variability that would be best suited to children participating in the Auskick program. 4 marks

Practice distribution _____

Practice variability _____

f. Identify and explain **one** sociocultural factor (other than peers) that may influence the success of the Auskick program. 2 marks

g. Explain why knowledge of performance feedback is generally more effective than knowledge of results. 2 marks

Question 2 (7 marks)

Emma McKeon is an Australian swimmer and world record holder. At the 2020 Olympics, she won a total of eleven Olympic medals, making her Australia's most decorated Olympian.

At a swimming event in 2021 at the Tokyo Aquatics Centre, McKeon swam the 100 m freestyle in a time of 51.96 seconds. An acute response that McKeon would have experienced during this race is a change in her arteriovenous oxygen (a-vO_2) difference.

a. Define 'a-vO_2 difference'. 1 mark

b. Identify **two** acute responses of the respiratory system and **two** acute responses of the cardiovascular system that would have occurred during this race. 4 marks

Acute respiratory responses	Acute cardiovascular responses

c. Select **one** acute respiratory response and **one** acute cardiovascular response identified in **part b.**, and explain how they would have assisted McKeon in her performance. 2 marks

Acute respiratory response

Acute cardiovascular response

Question 3 (6 marks)

A group of Australian rules football players competed in a modified handball game, with six players on each team. The players participated in two games each, and the games were five minutes in duration. One game was played on a small field size and the other was played on a large field size. Between each game, the players had five minutes of recovery time.

The following table shows activity-level data collected from the players.

	Player averages	
	Small field size (15 m × 15 m)	**Large field size (30 m × 30 m)**
Heart rate (% of maximum)	84	90
Blood lactate concentration (mmol/L)	3.6	4.8
Rating of perceived exertion (out of 10)	6	9

a. Using the data above, compare the factors that can cause fatigue associated with playing the modified Australian rules football game on a small field and a large field. 3 marks

b. In Australian rules football, a handball could be classified as either an open or a closed skill.

Classify the handball as an open skill or a closed skill and justify your response. 3 marks

Question 4 (8 marks)

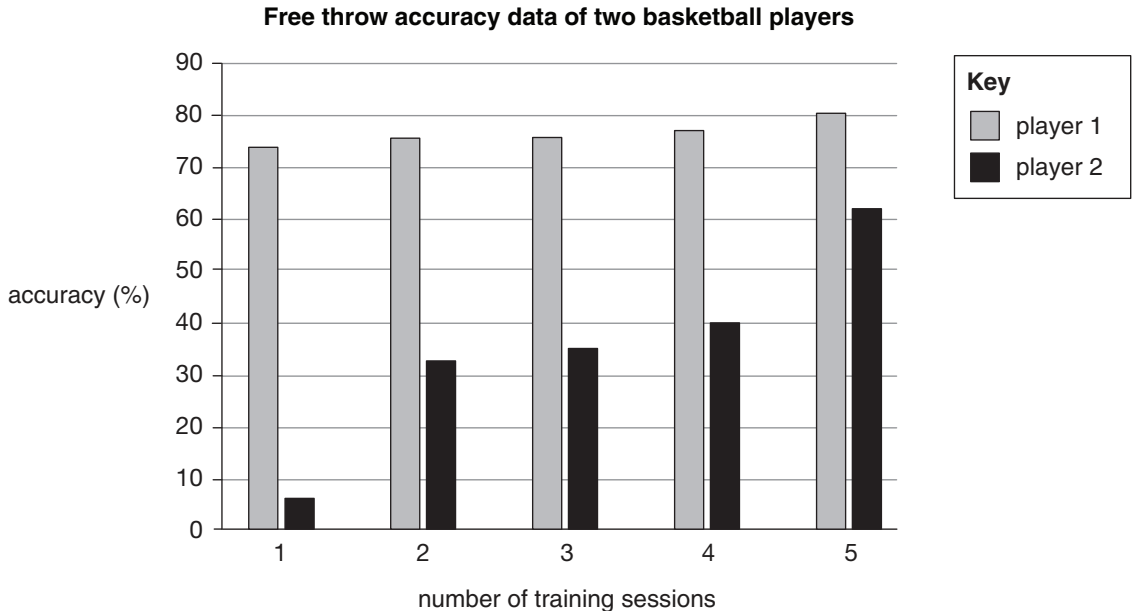
Stephanie Gilmore is an Australian professional surfer. In a surfing competition, Gilmore competes against other surfers in a variety of heats, lasting approximately 20–30 minutes. At the end of a heat, the surfers with the highest scores progress to the next heat and the other surfers are eliminated until there is an eventual winner.

In the first heat, Gilmore sprints 20–30 m down the sand to the water, where she intensely paddles out through the waves. She then waits on her surfboard until she selects a wave to catch. Once she catches a wave, she performs a series of powerful manoeuvres on the surfboard, which last approximately 8–15 seconds. Once her ride is complete, Gilmore retrieves her surfboard and paddles slowly back out through the water, where she waits to catch her next wave.

Using the information given, analyse the relative contribution of the three energy systems with specific reference to fatigue and recovery.

Question 5 (10 marks)

The graph below shows the free throw accuracy data of two basketball players over five training sessions with their coach.



While observing the players take free throws, the coach performs a qualitative movement analysis to improve the players' performance. The coach gathers the relevant knowledge and critical features of the skill performed and then takes a digital recording and watches the skill in action.

a. Outline the final **two** stages of a qualitative movement analysis. 4 marks

b. While undertaking the qualitative movement analysis, the coach obtains both qualitative movement information and quantitative free throw accuracy data.

Distinguish between qualitative movement information and quantitative free throw accuracy data and explain which would be more beneficial to the coach in analysing and improving player performance. 4 marks

c. Identify **one** method of data collection that the coach could have used to obtain the data shown in the graph on page 12 and provide at least **one** benefit of using this method. 2 marks

Question 6 (6 marks)

Golfers use golf clubs of various sizes depending on their distance away from the hole. When hitting the golf ball from a tee (tee off), most golfers will use a golf club called a driver, which is longer in length than the other clubs.

a. What type of lever is a golf club? 1 mark

b. Explain the mechanical advantage of a golf club and the impact this has on velocity during the tee off. 3 marks

c. State Newton's first law of motion and explain how it is applied during the tee off. 2 marks

Question 7 (16 marks)

The Tour de France is an annual bicycle race that consists of 21 stages over 23 days. Each stage of the tour can take as long as six hours and the cyclists cover 160 km per day on average across the 21 stages.

In the 2021 Tour de France, there were a total of 176 cyclists competing for 22 different teams. The race was held during summer in France, where temperatures can reach 40°C.

a. Explain what occurs physiologically when exercising in high temperatures and suggest how this may have impacted on the performance of the cyclists during the 2021 Tour de France. 4 marks

b. Suggest why a cyclist would ingest protein in combination with carbohydrates after a race to aid recovery. 2 marks

In the Tour de France, one member of each cycling team is known as the domestique. Domestiques will often collect food and water bottles from the team car to pass out among their teammates and consume themselves. They may ride in front of a team leader to block the wind for them, or even give up their bicycle if the team leader suffers a mechanical problem.

In the 2021 Tour de France, domestiques were seen drinking water and sport drinks from separate water bottles.

c. Describe **three** reasons why cyclists might consume both water and sports drinks during the Tour de France. 3 marks

At various points during the race, the domestique rides in front of their team leader to block the wind. This quickly fatigues the domestique and he often drops behind the race leaders as he is unable to maintain the group pace.

d. Name the energy system that makes the greatest contribution to ATP production in the cyclists competing in the Tour de France. 1 mark

e. Identify the most likely cause of fatigue for the domestique when riding in front of their team leader to block the wind. 1 mark

f. Explain why the domestique would be working above their lactate inflection point (LIP) when riding in front of their team leader. 2 marks

g. State whether active or passive recovery should be undertaken after completing a stage of the Tour de France and outline **two** reasons why this type of recovery would be suitable. 3 marks

Question 8 (8 marks)

Sienna and Kentaro visit a golf driving range to practise hitting golf balls. The aim is to hit each shot of the golf ball off the tee as straight as possible, and achieve the longest distance possible.

When Sienna strikes the golf ball off the tee, she successfully sends it straight down the driving range and consistently drives the ball close to 200 m each time. When Kentaro strikes the golf ball off the tee, there are times when some shots are hit sideways and there are times when he misses hitting the golf ball. After completing 50 tee off shots, the average distances of Sienna's and Kentaro's shots are 195 m and 102 m, respectively.

Explain the difference in results achieved by Sienna and Kentaro by using your understanding of biomechanical and skill acquisition principles for improving performance.

Your response should refer to:

- stages of learning
- force production
- stability
- Newton's second law of motion.

Question 9 (13 marks)

Lawson is a 15-year-old track cyclist who trains at the Victorian Institute of Sport. He primarily trains for sprint races, which are generally between three and eight laps of approximately 333 m, and focuses on raw sprinting power and race tactics to defeat opponents. Sprint cyclists train specifically to compete in races of shorter length and do not generally compete in endurance events.

a. As Lawson is at the starting line of a sprint race, he begins to feel anxious.

Identify **one** psychological strategy Lawson may use to improve concentration and describe how this strategy could improve his concentration. 2 marks

To improve the muscular power of his legs, Lawson followed the resistance training program shown below.

Exercise	Load (% of 1 repetition maximum, RM)	Sets	Repetitions	Contraction speed	Rest (minutes)
box jump with dumbbells	50	5	20	fast	2–3
45-degree leg press	60	5	6	fast	2–3
leg curl	25	6	5	fast	2–3
leg extension	60	4	6	slow–moderate	1
squat	60	5	4	fast	1
clean	50	4	5	fast	2–3

b. Critique the effectiveness of this program for improving Lawson's performance as a track cyclist through the development of muscular power. Use data from the training program to support your response. 4 marks

c. Discuss the influence of muscle fibre type and muscle cross-sectional area on generating muscular power for the sprint races Lawson competes in. 4 marks

Muscle fibre type _____

_____

_____

Muscle cross-sectional area _____

_____

_____

d. Identify **two** chronic muscular adaptations that Lawson would develop after undertaking this resistance training program. 2 marks

_____

_____

e. Outline how **one** of the chronic muscular adaptations identified in **part d.** would improve Lawson's performance as a track cyclist. 1 mark

_____

_____

_____

Question 10 (13 marks)

Kaj is a 16-year-old athlete who has been playing badminton for six years. Kaj recently represented Victoria in a badminton tournament in which he won all four pool matches before winning the grand final.

One week after Kaj won the grand final, his coach provided him with data collected from one of Kaj's tournament matches, as shown in the table below.

Measurement	Total
total number of forehand clears*	73
total number of backhand clears	38
total number of drop shots	34
total number of forehand drives**	78
total number of backhand drives	14
total number of forehand smashes	17
total number of lunges	49
total number of jumps	32
total number of sprints (0–5 metres)	56
total number of rallies longer than 20 seconds	18
average length of rally	12.50 seconds
total time spent above 95% HR max	6 minutes
total time spent above 85% HR max	12 minutes
total time spent above 75% HR max	24 minutes
length of match	42 minutes

*A clear is a high, overhand shot with the purpose of forcing an opponent around the court and along the baseline.

**A drive is a quick, flat, powerful, counter-attacking shot.

a. Identify **two** fitness components that are important when playing badminton. Use data from the table to justify your response. 4 marks

Fitness component 1 _____

_____

_____

Fitness component 2 _____

_____

_____

b. For each fitness component identified in **part a.**, name **one** standardised field-based test. 2 marks

Test for fitness component 1 _____

_____

Test for fitness component 2 _____

_____

c. Select **one** standardised field-based test named in **part b.** and justify the use of this test for a state-level badminton player like Kaj from a physiological, psychological and sociocultural perspective. 3 marks

Standardised field-based test _____

Physiological _____

_____

_____

Psychological _____

_____

_____

Sociocultural _____

_____

_____

In the lead-up to the next tournament, Kaj's coach has decided that Kaj should undergo a plyometrics program. Kaj will undertake this program three times per week for 10 weeks.

d. Suggest **one** strategy Kaj could use to monitor his training. 1 mark

_____

_____

e. Describe **two** possible plyometric exercises Kaj's coach could use as part of the program. You may use diagrams to support your answer. 2 marks

f. After six weeks of following the plyometrics program, Kaj starts to lose focus and motivation.

Identify **one** psychological strategy Kaj could use to stay committed to the program. 1 mark

Question 11 (4 marks)

a. Define 'ventilation' and state its formula. 2 marks

b. When an individual moves from a resting state to exercising, ventilation changes.

Explain the relationship between ventilation and oxygen consumption when an individual moves from a resting state to exercising. 2 marks

END OF QUESTION AND ANSWER BOOKLET

Neap

Trial Examination 2023

VCE Physical Education Units 3&4

Written Examination

Multiple-choice Answer Sheet

Student's Name: _____

Teacher's Name: _____

Instructions

Use a **pencil** for **all** entries. If you make a mistake, **erase** the incorrect answer – **do not** cross it out. Marks will **not** be deducted for incorrect answers.
No mark will be given if more than **one** answer is completed for any question.

All answers must be completed like this example: **A** B C D

Use pencil only

1	A	B	C	D
2	A	B	C	D
3	A	B	C	D
4	A	B	C	D
5	A	B	C	D
6	A	B	C	D
7	A	B	C	D
8	A	B	C	D
9	A	B	C	D
10	A	B	C	D
11	A	B	C	D
12	A	B	C	D
13	A	B	C	D
14	A	B	C	D
15	A	B	C	D