Neap

Trial Examination 2022

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.

Students are advised that this is a trial examination only and cannot in any way guarantee the content or the format of the 2022 VCE Physical Education Units 3&4 Written Examination.

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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

The role of myoglobin is to

A. carry oxygen molecules in skeletal muscle.

B. breakdown carbohydrates in muscle cells.

C. transport oxygen from the lungs to the rest of the body tissues and transport carbon dioxide from the body tissues back to the lungs.

D. breakdown lactate and pyruvic acid during high intensity exercise.

Question 2

The following data was collected during an activity analysis of an under-14s lacrosse game.

Periods of Work			**Periods of Rest**	
Sprint	Hard Run	Jog	Walking	Standing Still
IIII IIII III	IIII III	IIII IIII IIII IIII	IIII IIII IIII II	III

Based on the data, which row of the table gives the correct work-to-rest ratio and dominant energy system for the game?

	Work-to-rest ratio	**Dominant energy system**
A.	1 : 2	anaerobic glycolysis
B.	2 : 1	anaerobic glycolysis
C.	2 : 1	aerobic energy system
D.	2 : 1	ATP–CP system

Question 3

When conducting fitness testing for a VCE Physical Education class, the teacher prefers conducting field tests such as the Cooper's 12-minute run and Yo-Yo intermittent recovery test over laboratory tests such as the VO_2 max treadmill test or bike test.

The teacher is most likely to prefer field tests over laboratory tests because field tests are more

A. accurate.

B. practical.

C. reliable.

D. individualised.

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Question 4

Which component of fitness does the 30-second Wingate test measure?

A. anaerobic capacity

B. muscular power

C. muscular strength

D. speed

Question 5

A hockey coach provides constant praise and encouragement to their young players in an attempt to decrease nervousness and enhance the learning of a skill.

Which one of the following constraints is the hockey coach employing?

A. the task

B. the environment

C. the psychological

D. the individual

Question 6

An increase in which one of the following chronic adaptations to training would assist with increasing an athlete's lactate inflection point (LIP)?

A. contractile proteins

B. muscle hypertrophy

C. mitochondrial mass

D. ATPase enzyme activity

Question 7

A Year 12 Physical Education student is training for a 1500 m swimming race at their local 25 m swimming pool. During one training session they swim 21 laps of the pool.

Which row of the table shows the correct distance and displacement of the student during their training session?

	Distance	Displacement
A.	21 m	0 m
B.	525 m	525 m
C.	25 m	525 m
D.	525 m	25 m

Question 8

In addition to external factors, the three factors that determine a projectile's motion are

A. speed of release, angle of release and height of release.

B. height of release, angle of release and air resistance.

C. speed of release, angle of release and gravity.

D. friction, gravity and angle of release.

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Question 9

Which one of the following is **not** an example of intrinsic feedback?

A. a basketball player watching the basketball miss the ring in a three-point attempt

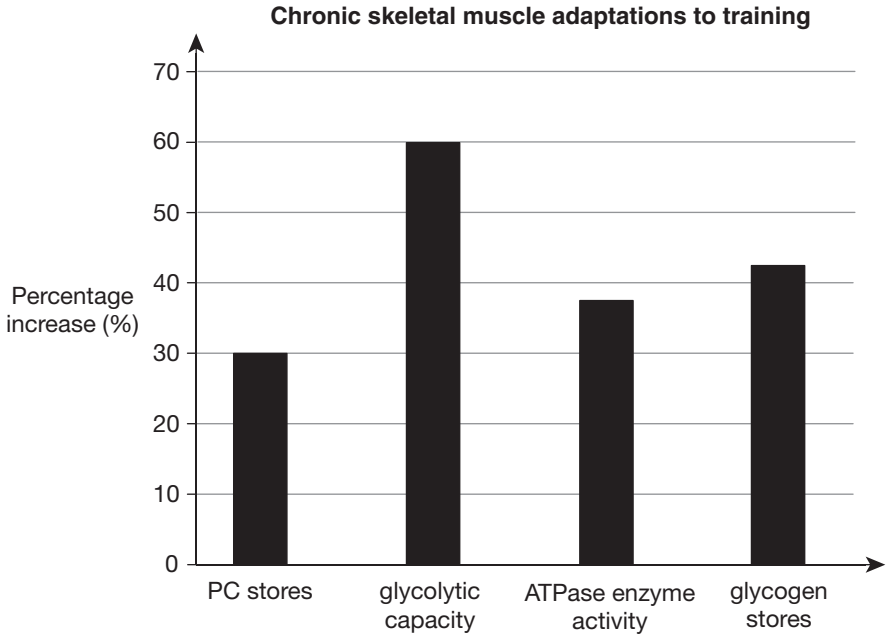
B. a coach using video analysis to error correct a player's golf swing

C. a player feeling their hockey stick strike the ball during an attempt to pass to a teammate

D. a cricketer feeling the spin they put on the ball as they release the cricket delivery

Question 10

The graph below shows the chronic skeletal muscle adaptations of an athlete after they complete a 10-week training program.



Which type of training is most likely to lead to the improvements shown in the graph?

A. aerobic

B. long-interval

C. continuous

D. anaerobic

Question 11

Which one of the following gives the correct order of the four principles of qualitative movement analysis?

A. preparation, observation, evaluation, error correction

B. preparation, evaluation, observation, error correction

C. observation, preparation, evaluation, error correction

D. preparation, error correction, observation, evaluation

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Question 12

If an athlete undertook four sets of eight repetitions with a weight of 85% of one repetition maximum (RM), the fitness component developed effectively would be

A. muscular power.

B. local muscular endurance.

C. muscular strength.

D. agility.

Question 13

Arteriovenous oxygen (a-vO_2) difference is the difference between the oxygen content in the arteries and the oxygen content in the veins. Aerobically trained individuals have a greater a-vO_2 difference than untrained individuals.

Which one of the following factors does **not** influence a-vO_2 difference?

A. capillarisation

B. myoglobin

C. mitochondria

D. oxidative enzymes

Question 14

A student is bowling in an interschool cricket game.

When bowling to an opposition batter, which type of attention would the student use?

A. broad-internal focus

B. broad-external focus

C. narrow-internal focus

D. narrow-external focus

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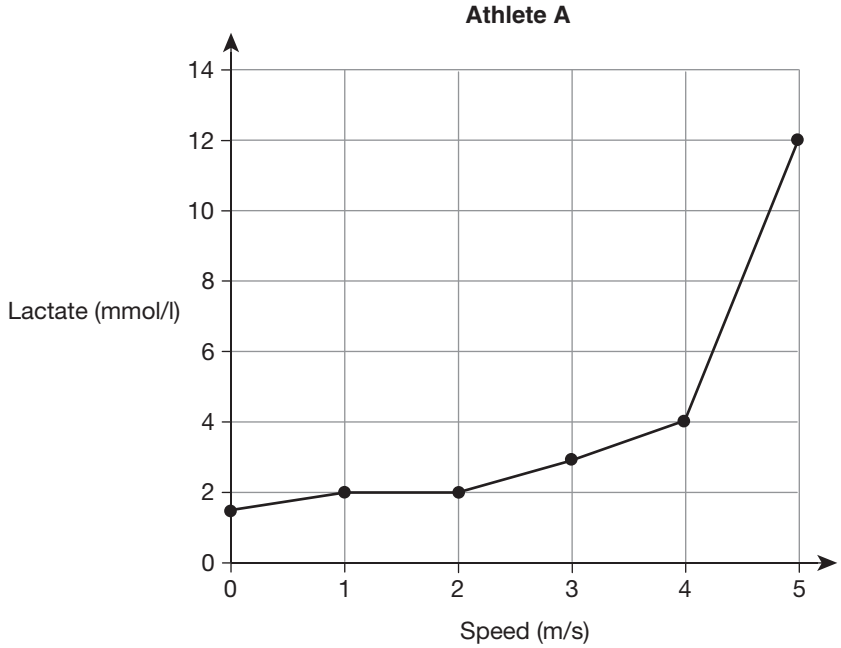
Question 15

The graph below shows that when athlete A reaches a speed of 4 m/s, they attain their lactate inflection point (LIP).



At the LIP, the energy system contributing most to ATP production is the

A. anaerobic glycolysis system.

B. aerobic glycolysis system.

C. ATP–CP system.

D. aerobic lipolysis system.

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SECTION B

Instructions for Section B

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

Question 1 (13 marks)

a. The world record times for two of the men's sprint swimming events are shown below.

Swimming event	Competitor	Record
50 m freestyle	Cesar Ceilo (Brazil)	20.91 seconds
400 m freestyle	Paul Biederman (Germany)	3.40.07 minutes

With reference to energy system interplay, explain why a 400 m freestyle event cannot be swum at the same pace as a 50 m freestyle event. 3 marks

b. State the most effective type of recovery for the 50 m and 400 m freestyle events and describe how it assists the body in returning to pre-exercise levels. 4 marks

50 m freestyle

400 m freestyle

c. Give the most appropriate training method for the 50 m freestyle event. 1 mark

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d. Outline the conditioning phase for the training method given in **part c.** Include appropriate sets, repetitions, W : R ratio and intensity in your response. 3 marks

e. Before undertaking any training session, a thorough warm-up and cool-down should be conducted.

Outline the purpose of a warm-up. 2 marks

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Question 2 (16 marks)

Sonya plays a game of tag rugby every weekend at the park with her friends.

After playing 55 minutes of a game, Sonya rested for approximately one minute in the fullback position as her team prepared to start the next play. When the play started, the ball was thrown to Sonya who caught it and sprinted 100 m down the field, past multiple opposing team members, until she scored a goal. After she scored the goal, she celebrated with her teammates and slowly jogged 100 m back to her fullback position, where she rested for two minutes while waiting for the next play to start.

a. Describe Sonya's energy system interplay during this period of the game. 6 marks

b. Identify and explain a fatigue mechanism that would have had an impact on Sonya as she was about to score the try. 2 marks

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c. At the conclusion of the game, which Sonya's team narrowly won, Sonya was talking with her teammates, as shown below.

Sonya's teammate:	How do you feel now that we've won?
Sonya:	I feel great, but after 80 minutes of playing high-intensity tag rugby, I'm exhausted.

Identify and describe **one** nutritional strategy, **one** physiological strategy and **one** psychological strategy that Sonya could have used to aid her recovery after the game. 6 marks

d. Compared to many other tag rugby players she plays against, Sonya has a lighter body weight. The table below shows the weight and velocity of Sonya and an opposing team member.

	Sonya	**Opposing team member**
Weight (kg)	80	100
Velocity (m/s)	7	6

Sonya and the opposing team member collide.

Determine which of the two players has the greater momentum and describe the likely outcome of this collision for both players. 2 marks

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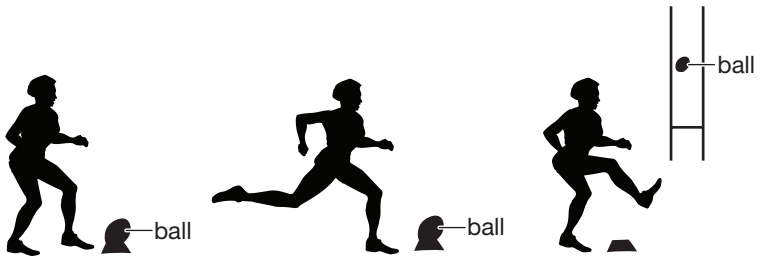
Question 3 (18 marks)

Ivar also plays on Sonya's tag rugby team. Ivar works full time and can only practice tag rugby on the weekends. It is Ivar's job to perform a conversion kick after a goal has been scored. He does this by placing the ball on a small cup, taking a short run-up and then kicking the ball through the posts and over the crossbar, as shown in the diagram below. If Ivar is successful, his team is awarded two points.



a. Apart from mental imagery, identify **one** psychological strategy Ivar may use as he prepares to take a conversion kick and explain how this strategy may aid his concentration. 2 marks

b. Identify **one** fitness component required to perform the kicking action and justify your choice. 2 marks

c. State Newton's first law of motion and explain how it relates to the conversion kick in rugby. 2 marks

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d. The conversion kick is an example of a third-class lever.

Define the mechanical advantage of a third-class lever and explain how this is beneficial when kicking the rugby ball. 3 marks

e. With reference to practice distribution, identify the type of practice Ivar would undertake when practicing his conversion kick. Justify your response. 2 marks

f. Before Ivar began playing tag rugby, he used to play competitive rugby league. Despite having a relatively lighter body weight of 90 kg, Ivar was known for being a strong tackler and often made tackles against opposing team members who were over 30 kg heavier than him.

Referring to the biomechanical principle of stability, identify **three** ways in which Ivar can maximise stability, improve balance and enhance equilibrium while successfully making these tackles. 3 marks

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g. Rugby league is a popular winter sport played and watched in Queensland, Australia.

Ivar grew up south of Brisbane and started playing rugby at a young age. Ivar's family was highly involved in his development in playing rugby as his older brother also played the sport and his dad coached him.

Identity and explain **two** sociocultural factors (other than family) that may have assisted in the development of Ivar's rugby skills at a young age. 4 marks

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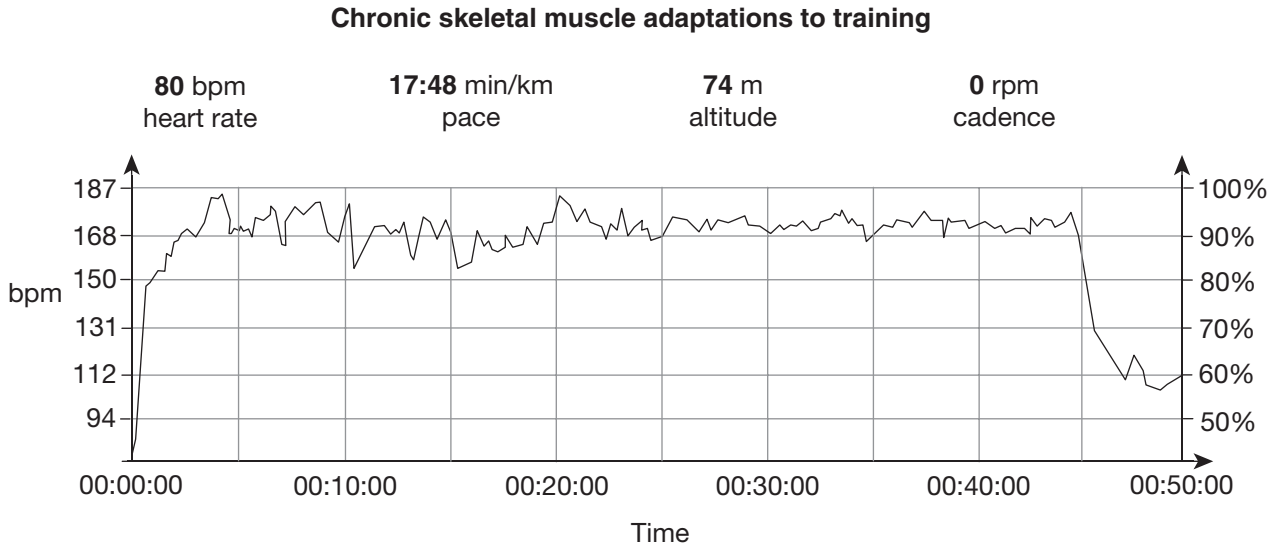
Question 4 (9 marks)

Personal fitness trackers are wearable electronic devices that monitor and track health-related metrics such as distance covered, heart rate, calorie consumption and sleep quality. The graph below shows heart rate data collected by a personal fitness tracker belonging to a 43-year-old individual who has completed a running session.



a. Explain why an oxygen deficit occurs at the beginning of an exercise session and discuss **one** factor that could determine the size of the oxygen deficit. 4 marks

b. Identify when the individual reaches their steady state in the graph above and explain what this means in terms of energy supply to the working muscles. 2 marks

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At the conclusion of exercise, oxygen uptake does not immediately return to resting levels despite the dramatic decrease in demand for ATP resynthesis.

c. What is the athlete experiencing at this stage? 1 mark

d. Give **two** reasons why the effect identified in **part c.** occurs. 2 marks

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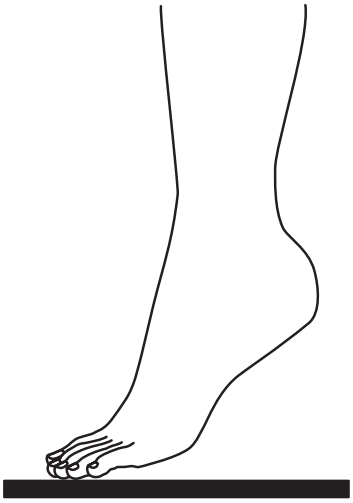
Question 5 (4 marks)
The diagram below shows the foot of a springboard diver who is standing on their tiptoes preparing for their diving routine.



a. The human body is a system of levers that allow movement to occur.
What class of lever is depicted in the diagram above? 1 mark

_____

b. On the diagram above, label the:

- axis (fulcrum)
- resistance (load)
- force (effort). 3 marks

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Question 6 (9 marks)

In a platform diving competition, divers jump from platforms with heights that range from 26 m to 28 m. Divers begin with a short 5–7 m run-up, jump off the platform into the air and then perform a series of manoeuvres before landing safely in the water below. Judges score the divers on elements such as the take-off, number of somersaults, number of twists and entry into the water.

Discuss the relevant biomechanical principles that enable a diver to perform successfully in a platform diving competition.

Your response should refer to:

- Newton's laws of motion
- angular velocity
- conservation of momentum.

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Question 7 (6 marks)

Lacrosse is a sport where players try to shoot a rubber ball past a goalkeeper into a goal. Players use a long stick with a net on the end, which helps cradle the ball in preparation for passing to teammates or shooting a goal. Games are played for 60 minutes and are divided into 15-minute quarters.

a. An adult lacrosse stick can be up to 182 cm in length, but junior lacrosse sticks are usually 94 cm in length and much lighter.

With reference to the relevant biomechanical principles, explain why a shorter and lighter lacrosse stick assists in skill development for junior players. 3 marks

The following graph shows the goal shooting accuracy between two 11-year-old junior lacrosse players.

b. After training session 1, player 2 reported that they were uninterested in attending another session; however, after training session 2, player 2 changed their mind and was excited to come back for another training session.

Referencing the data above and the stages of learning, analyse the links between participation, motor skill development and performance. 3 marks

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Question 8 (14 marks)

Aiko is a 37-year-old parent of two children who works full time. Aiko has always been physically active, attending high-intensity workout classes twice per week as well as running in her local 5 km park most Saturday mornings.

Aiko has decided that she would like to complete a 21 km half-marathon in her local area in six months' time.

Aiko employs a personal trainer, Divya, who suggests she undertake a series of fitness tests prior to undertaking a training program and at the conclusion of the training program.

a. Identify **two** purposes of conducting fitness tests prior to developing a training program. 2 marks

b. Aiko undertook a series of fitness tests and her performances were recorded, as shown in the table below. No additional paperwork or information was collected by Divya from Aiko prior to the commencement of the fitness tests.

Fitness test	Ranking
Cooper's 12-minute run	average
trunk flexion (sit-and-reach test)	excellent
hydrodensitometry (underwater weighing)	average
1 RM leg press	poor
60-second push-up test	average

Evaluate the appropriateness of the tests undertaken by Aiko from a physiological **or** psychological perspective of fitness assessment. 3 marks

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Muscular endurance and aerobic power training were recommended to Aiko by her personal trainer, Divya, in preparation for the marathon event. A suggested program is shown in the table below.

Weeks	Heart rate training zone	Session type	Session length (minutes)	Session per week
1–3	50–65%	running	45	3
4–6	50–65%	running	50	3
7–9	70–75%	running	60	3
10–13	70–75%	running	65	4
14–17	75–80%	running	70	4
17–20	75–80%	running	75	4
21–24	90–95+%	running	80	3

c. Referring to training principles, critique the effectiveness of the training program above in developing aerobic power for Aiko. Use data from the training program to support your response. 3 marks

d. Identify **one** training principle that has been applied incorrectly in the program and suggest what Divya should do to ensure this principle is applied correctly. 2 marks

e. Divya suggests to Aiko that she should monitor and record her training over the course of the 24-week program.

State **one** strategy that Aiko could use to monitor her training. 1 mark

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f. Monitoring training provides an understanding of how hard an athlete is working paralleled with how well they are coping.

Provide **one** physiological variable, **one** psychological variable and **one** sociological variable that Aiko could record to give her coach greater knowledge about her training and development. 3 marks

Physiological _____

_____

Psychological _____

_____

Sociological _____

_____

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Question 9 (7 marks)

The Puffing Billy Railway is a historic steam train that runs through the Dandenong Ranges. The Puffing Billy Running Festival takes place each year and is open to experienced runners as well as those who want to challenge themselves. The object of the race is to beat Puffing Billy to its final destination over a 13.5 km course.

In 2018, the temperature reached 32°C on the day of the event.

a. Explain what occurs to individuals physiologically when exercising in high temperatures and suggest what implications this could have on an individual participating in the event in 2018. 4 marks

b. Replacing body fluids lost during a race is an integral part of the recovery process, especially when temperatures reach as high as 32°C.

Evaluate the difference between drinking water and sports drinks as a hydration strategy during sustained endurance exercise such as the Puffing Billy Running Festival. 3 marks

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Question 10 (6 marks)

Activity analysis is used to assist coaches, players and sports scientists in determining the physiological requirements of sports and activities. It also allows them to gain knowledge that can be used to design specific training situations or programs.

a. List **two** types of information that can be collected from an activity analysis for a sport such as European handball. 2 marks

An activity analysis was conducted on a European handball game and found that the predominant fitness components required for the sport were muscular power (upper body) and speed.

b. Name **one** recognised fitness test to assess each of these fitness components. 2 marks

Muscular power

Speed

c. Identify **one** method of data collection that the individual who conducted the activity analysis could have used and provide **one** benefit of using this method. 2 marks

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Question 11 (3 marks)

Aerobic type training leads to chronic respiratory adaptations such as an increase in alveoli numbers, alveoli surface area and pulmonary diffusion.

With reference to the respiratory and cardiovascular systems and the lactate inflection point (LIP), discuss how aerobic type training can benefit endurance athletes.

END OF QUESTION AND ANSWER BOOKLET

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Trial Examination 2022

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

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