2025 VCE Physical Education external assessment report

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses, nor to include every possible correct response.

The statistics in this report may be subject to rounding resulting in a total more or less than 100 per cent.

Section A – Multiple-choice questions

The table indicates the percentage of students who chose each option. Grey shading and bold text indicates the correct response.

Question	Correct answer	% A	% B	% C	% D	Comments
1	D	2	0	2	**96**	
2	D	3	2	30	**65**	
3	A	**69**	8	5	17	
4	B	7	**86**	4	2	
5	C	4	0	**93**	2	
6	B	22	**62**	12	5	
7	C	36	14	**41**	9	It is an increase in size and number of mitochondria that directly leads to a delayed lactate inflection point (LIP).
8	D	2	17	3	**78**	
9	C	22	6	**58**	14	
10	C	13	22	**63**	3	
11	B	0	**96**	0	3	
12	B	1	**91**	6	2	
13	A	**75**	1	24	1	
14	B	14	**80**	2	3	
15	D	11	2	3	**83**	
16	A	**77**	3	10	11	
17	C	9	4	**84**	3	
18	B	36	**37**	11	15	It takes longer to acquire skills through random

Question	Correct answer	% A	% B	% C	% D	Comments
						practice, but this method has a greater rate of retention.
19	C	3	16	**80**	1	
20	C	10	1	**82**	6	

Section B

Question 1a.

Mark	0	1	Average
%	18	82	0.8

The correct answer was ‘excess post-exercise oxygen consumption (EPOC)’.

Question 1b.

Mark	0	1	Average
%	68	32	0.3

Students were required to outline an activity that could be appropriate for a cool-down.

Acceptable answers included:

- kayak at lower intensity
- static stretch – holding an arm across the body.

Common issues included:

- listing rather than outlining a response
- not linking the response to the correct activity context (kayaking) – some students provided ‘jogging’ as a response, which is not specific to this activity
- not providing a specific example of a static stretch.

Question 1c.

Mark	0	1	2	3	Average
%	23	15	33	28	1.7

Students were required to use the stimulus to predict whether Curtis McGrath, an Australian paracanoeist, would have reached steady state and justify their prediction.

Responses that scored highly linked the performance characteristics of the event (intensity and duration) to their justification.

The following is an example of an ideal response:

Curtis is not likely to reach steady state due to the 41.708 second duration of the event. As a result of this short-duration maximal-intensity effort, the anaerobic systems are likely the major contributor, indicating that oxygen supply does not equal demand and Curtis is in oxygen deficit for the duration of the event.

Question 1d.

Mark	0	1	2	3	Average
%	3	14	39	45	2.3

Students were required to identify resistance training protocols for a selected exercise to improve muscular power for Curtis.

Acceptable exercises included:

- chest press
- lat pull-down
- seated row.

The correct answer for repetitions is three to ten (or a number within this range).

The correct answer for % 1RM is 30–70% 1RM (or a percentage within this range).

Question 1e.

Mark	0	1	2	3	4	Average
%	32	20	20	19	8	1.5

To be awarded full marks, students were expected to explain how an improvement in Curtis's lactate tolerance could have contributed to his performance in his kayak event.

Responses that scored highly explained how training that focused on the anaerobic glycolysis system produced the adaptation of increased muscle buffering capacity, which would result in an increase in lactate tolerance.

Common issues included:

- confusing lactate tolerance with LIP
- not providing a physiological reason/adaptation (increased muscle buffering capacity) that could explain an increase in lactate tolerance. Unit 4 Area of Study 2 is clear in identifying performance improvements such as an increase in lactate tolerance and requires students to explain adaptations that account for these outcomes.

The following is an example of an ideal response:

During intermediate interval training, there would be a large contribution from the anaerobic glycolysis system, which results in an accumulation of metabolic by-products. This training would increase Curtis's muscle buffering capacity, meaning he can withstand the impact of high lactate levels and can maintain his force production while kayaking, finishing in a faster time.

Question 2ai.

Mark	0	1	Average
%	10	90	0.9

The correct answer was 'cognitive'.

Question 2aii.

Mark	0	1	Average
%	15	85	0.9

The correct answer was ‘continuous’.

Question 2b.

Mark	0	1	2	3	4	Average
%	49	20	17	11	3	1.0

To be awarded full marks, students needed to evaluate the most appropriate practice distribution for Mick, referring to his stage of learning and type of skill in their response. The most appropriate practice distribution was distributed practice.

The following is an example of a high-scoring response:

> *As Mick is a cognitive learner when he first learnt to walk with crutches, distributed practice, which is shorter more frequent practice, would be most appropriate. This ensures he can experience more recovery periods as well as receive more frequent feedback to improve quickly. As this is a continuous skill he is likely to fatigue quickly and so distributed is more appropriate than massed which is fewer but longer practice sessions as that would fatigue Mick more and give him less opportunity for feedback.*

Many responses incorrectly evaluated type of practice (part or whole) or variability of practice (blocked or random). Students are reminded to review the categories of practice to ensure they are addressing the requirements of the question.

Question 2c.

Mark	0	1	2	3	4	Average
%	5	8	10	22	55	3.1

To be awarded full marks, students needed to explain how the use of goal setting could have improved Mick’s participation, skill development and performance.

Responses that scored highly linked goal setting to an increase in Mick’s motivation, which would increase his participation and opportunity for practice, in turn increasing his skill development and performance.

The following is an example of an ideal response:

> Goal setting involves setting specific goals or outcomes to be achieved through his practice, which can motivate him to participate to achieve his goals. This participation leads to an increase in practice, which leads to an increase in motor skill development when running with crutches. This would lead to an increase in performance, which would further motivate him to participate.

Question 2d.

Mark	0	1	2	Average
%	62	23	15	0.6

Students were required to describe a nutritional strategy that Mick could have used during the event to delay fatigue.

Responses that scored highly were able to link the consumption of carbohydrates to the delay of fatigue due to glycogen depletion.

The following is an example of a high-scoring response:

> *Mick could consume carbohydrates during the event to provide an alternate source of fuel for the muscles, delaying the risk of fatigue due to glycogen depletion.*

Common issues included:

- referring to carbohydrate loading, despite the context being 'during the event'. In this study design, students need to be able to describe nutritional strategies that enhance performance and recovery and delay fatigue prior to, during and following an event.
- using the term 'carbs', which is not an acceptable abbreviation for carbohydrate
- referring to glycaemic index (GI) ranking, which is outside of the scope of the study design.

Question 3a.

Mark	0	1	2	Average
%	59	26	15	0.6

To be awarded full marks, students needed to clearly explain the purpose of an activity analysis.

The following is a sample response:

> *An activity analysis can aid the coach in determining the physiological requirements of lacrosse to determine the relevant fitness components, energy systems and muscle groups. This allows the coach to select fitness tests and design a specific training program for players.*

A common issue was explaining that an activity analysis could be used to identify strengths and weaknesses of an athlete.

Students are reminded that the purpose of an activity analysis (identifying the physiological requirements of an activity) and the purpose of fitness testing (identifying strengths and weaknesses) are different.

Question 3b.

Mark	0	1	2	Average
%	41	23	36	1.0

Students were required to identify an alternative type of data and outline how this could be used as part of a coach's activity analysis.

Accepted types of data included:

- skill frequency
- heart rate
- work-to-rest ratio (W:R).

A common issue was to identify a *method* of data collection (such as heart rate monitors or GPS), rather than a *type* of data.

Students are expected to undertake an activity analysis as part of the requirements of the study design and therefore will use a variety of methods of data analysis when doing this. However, when integrating their practical participation with their theoretical application, as per the study design, students are to analyse the types of data, not methods of collection.

The following is an example of a high-scoring response:

> *Collecting skill frequency data such as jumps can help the coach identify relevant fitness components and muscle groups required in lacrosse.*

Question 3c.

Mark	0	1	2	3	4	5	6	Average
%	9	14	23	26	19	8	1	2.6

Students were required to reference data to analyse the relationship between the energy systems used during activity and recovery for lacrosse midfielders and defenders.

Responses that scored highly were able to:

- reference all energy systems within the context of lacrosse midfielders and defenders
- identify the aerobic system as the greatest contributor, with supporting data
- use specific numbers from the data to support their explanation
- explain the energy system contribution using the key terms ‘rate’ and ‘yield’
- compare rest times and the resulting difference in creatine phosphate (CP) restoration for the two positions
- use the information about rest time to compare the energy system contribution during work periods for the two positions.

Common issues included:

- writing a generic energy system interplay without comparing the two positions
- referring to the information without specific data references
- using terms outside the scope of the study design, such as ‘dominant’ and ‘predominant’, instead of accepted terms such as ‘rate’, ‘yield’ and ‘contribution at varying intensities’.

The following is an example of an ideal response:

> Both midfielders and defenders use all three energy systems across a lacrosse match. However, the aerobic system (large yield) contributes the most for both positions, given the long game duration (80 minutes).
>
> Midfielders spend less total time on the field (36 minutes compared to 59 minutes) but complete more sprinting and running (218 m and 1244 m). This indicates a greater reliance on the anaerobic systems – the adenosine triphosphate–creatine phosphate system (ATP–CP) and anaerobic glycolysis – which provide ATP at a faster rate but with a smaller yield to support repeated explosive efforts. Their reduced playing time means they spend longer on the bench, allowing the aerobic system to restore CP so that the ATP–CP system can be used again for subsequent high-intensity efforts. With more passive recovery available, midfielders are better able to sustain a higher intensity throughout the game.
>
> Defenders, on the other hand, spend more time on the field (59 minutes) but cover less sprinting and running distance (152 m and 1058 m). This reflects a lower working intensity and a larger reliance on the aerobic system, which provides ATP more slowly. Because defenders have less bench time for recovery,

they have fewer opportunities to restore CP, resulting in a reduced capacity for explosive actions as the game progresses.

Question 3d.

Mark	0	1	2	3	4	Average
%	20	9	23	29	19	2.2

To be awarded full marks, students were expected to identify that the Yo-Yo intermittent recovery test was the most suitable test. They needed to use their understanding of the concept of specificity to justify their selection and explain why the Cooper 12-minute run test was less appropriate.

Many responses used information from the stimulus correctly and displayed a strong understanding of the concept of specificity and the need to replicate movement patterns in test selection.

The knowledge required for this question should be developed through participation in an assessment of fitness and then applied through the information provided in the stimulus. In this study design, students are not required to know the methods of specific fitness tests.

Common issues included:

- a lack of understanding or recognition that, when evaluating two options, a comparison to the non-selected variable identified in the stimulus needs to be made
- not defending the selected choice with evidence or reasoning.

The following is an example of a high-scoring response.

The Yo-Yo intermittent test would be the most appropriate from a physiological perspective as it replicates the physiological demands of lacrosse. The intermittent nature of the test, with periods of walking and periods of higher intensity running is suited to the movement patterns and demands of lacrosse players, as they walk for 172m and run 1169m. The Cooper 12 minute run test doesn't reflect the intermittent nature of lacrosse as it is continuous, making is less suitable.

Question 3e.

Mark	0	1	2	3	Average
%	45	28	20	8	0.9

To be awarded full marks, students needed to use their understanding of VO_2 max to explain how it would improve the performance of the lacrosse players.

Responses that scored highly demonstrated an understanding that a high VO_2 max leads to an increased rate of energy production via the aerobic system, and described how this would enhance performance in lacrosse.

Common issues included:

- relying on generic language such as 'working at a higher intensity for longer' and not linking this performance benefit to the aerobic system
- not including reference to the context of the question, which was lacrosse.

The following is an example of an ideal response:

An increased VO_2 max increases the maximum amount of oxygen that can be taken up, transported to and utilised by the working muscles per minute. This increase allows for faster rates of energy production via the aerobic system, which means the lacrosse player can run at a higher intensity aerobically.

Question 3f.

Mark	0	1	2	3	Average
%	37	26	31	7	1.1

Students were required to explain how an appropriate respiratory adaptation could contribute to an increased VO_2 max.

Acceptable adaptations were:

- increased surface area of alveoli
- increased size of alveoli
- increased pulmonary diffusion
- increase ventilation (max)
- increased tidal volume.

Some responses that used tidal volume did not show an understanding of the concept as an adaptation and did not link it to maximal ventilation and VO_2 max.

The following is an example of a high-scoring response:

> *Increased pulmonary diffusion increases the amount of oxygen that is diffused through the alveoli into the blood. This directly increases the uptake of oxygen which increases the availability of oxygen for working muscles, increasing aerobic ATP production and therefore VO_2 max.*

Question 4a.

Mark	0	1	2	Average
%	26	26	48	1.2

Students were required to explain how increased motor unit recruitment could improve performance in tennis.

Responses that scored highly were able to demonstrate an understanding of the outcome of increased motor unit recruitment in the context of a tennis match.

The following is an example of a high-scoring response:

> *Increased motor unit recruitment allows more muscle to be used during contractions, increasing the force produced. This allows for more powerful tennis shots, making them more difficult to return.*

Question 4b.

Mark	0	1	2	Average
%	50	26	24	0.8

Students were required to explain how an increase in muscle strength could increase muscular power.

Responses that scored highly were able to demonstrate an understanding of the relationship between muscular strength, muscular power and speed by focusing on the characteristics of each fitness component rather than just definitions.

The following is an example of a high-scoring response:

Muscular power is the ability of the muscle to produce maximal force in the shortest time possible. It is a combination of speed and strength, therefore, as muscular strength increases peak force production, it will also increase muscular power.

Question 4c.

Mark	0	1	2	Average
%	46	33	21	0.8

Students were required to explain how a type of muscle fibre influences speed production.

Responses that scored highly were able to use a characteristic of their chosen muscle fibre type to explain how it influences the ability of the body or body parts to move from point A to point B in the fastest time possible.

Students were able to use either fast- or slow-twitch muscle fibres in their responses.

The following is an example of a high-scoring response:

Fast twitch muscle fibres increase speed as they contract faster, allowing the body to move from one place to another in the shortest time possible.

Question 4d.

Mark	0	1	2	Average
%	34	35	30	1.0

Students were required to name a psychological factor and explain how it might have benefited Aryna during the competition.

Responses that scored highly were able to explain how Aryna would use the diary to alter or mimic the strategies in place to optimise the targeted factor.

Some students were able to identify a psychological factor but referred to how this might prevent overtraining, rather than the correct context, which was during the competition.

Acceptable psychological factors included:

- motivation
- stress/anxiety
- arousal
- concentration
- confidence
- sleep.

The following is an example of a high-scoring response:

Aryna could have monitored her arousal levels so she would be aware if her arousal levels needed to be promoted or reduced and could implement strategies to achieve optimal arousal to enhance her performance during competition.

Question 4e.

Mark	0	1	Average
%	47	53	0.6

The answer was ‘variety’.

Many students wrote variability instead of variety. Variability is a classification of practice, while variety is a training principle.

Question 4fi.

Mark	0	1	2	3	4	Average
%	34	20	18	25	3	1.4

Students were required to critique the effectiveness of a training program to improve speed.

Responses that scored highly were able to correctly critique the program by:

- identifying a strength of the program
- identifying a weakness of the program
- making a recommendation to improve the weakness that had been identified
- using this information to determine that the program was not effective.

The following is an example of a high-scoring response:

> *This program would not be effective in improving Aryna’s speed. While the work period of 3 and 5 seconds is an appropriate prescription for short interval training to target speed, the intensity of 7 RPE is too low as she would be running rather than sprinting. To make the program effective for improving speed, the intensity should be increased to an RPE of 9–10.*

Question 4fii.

Mark	0	1	2	3	Average
%	53	21	19	7	0.8

Students were required to discuss the suitability of reducing rest periods as a form of progression.

Responses that scored highly were able to identify that reducing rest periods is not suitable as it may alter the targeted energy system, therefore reducing specificity of the program.

The following is an example of a high-scoring response:

> *Decreasing rest would not be suitable as it alters the work to rest ratio and thus the targeted energy system. This could result in a loss of specificity of the program.*

Many responses suggested that reducing rest time would be appropriate to make the training program more difficult and elicit adaptations. If the response outlined that it could be appropriate as long as the targeted energy system didn’t change and it remained specific, marks may be awarded.

Question 5ai.

Mark	0	1	Average
%	60	40	0.4

The correct response was ‘preparation’.

Question 5aii.

Mark	0	1	2	3	Average
%	40	19	22	20	1.2

To be awarded full marks, students needed to describe how a coach could use observation, evaluation and error correction to improve the performance of a ramp shot.

Responses that scored highly described each stage within the context of the ramp shot.

The following is an example of a high-scoring response:

> *During observation the coach should watch or record the athlete completing the ramp shot. They should use the evaluation stage to determine strengths and weaknesses and errors in the shot. In the error correction stage, the coach can provide feedback and implement drills which target the errors observed, improving ramp shot performance.*

Question 5b.

Mark	0	1	2	3	Average
%	59	13	13	15	0.9

To be awarded full marks, students needed to select a biomechanical principle and explain how that principle would allow the ramp shot to be more successful against a fast bowler. Many students were not awarded any marks due to selecting an inappropriate biomechanical principle.

Responses that scored highly identified and explained an appropriate biomechanical principle and described what a successful performance looked like when the principle was applied.

Acceptable biomechanical principles were:

- Newton’s first law of motion
- Newton’s third law of motion
- conservation of momentum
- impulse
- speed of release.

The following is an example of a high-scoring response:

> *The ramp shot could be more successfully played against a fast bowler due to the principle of conservation of momentum. This principle states that the total momentum prior to impact will be the same following impact. When the ball is bowled from a fast bowler it has greater momentum (velocity x mass) so the greater the momentum prior to impact, the greater momentum after impact. The ball is likely to travel further over the fielder’s heads making it harder to stop.*

Question 6a.

Mark	0	1	2	Average
%	3	43	53	1.5

The correct response for blood volume was ‘decrease’.

The correct response for body temperature was ‘increase’.

Question 6b.

Mark	0	1	2	3	4	Average
%	17	24	25	20	15	1.9

To be awarded full marks, students needed to analyse the data and use it to explain the most likely reason for the difference in race time with respect to fatigue mechanisms.

Responses that scored highly used the data to identify that thermoregulatory fatigue was the fatigue mechanism impacting the race times, and explained how the physiological process of thermoregulatory fatigue impacts performance.

Some responses confused thermoregulation with thermoregulatory fatigue. Students are encouraged to explore the differences in thermoregulation under a variety of environmental conditions.

The following is an example of a high-scoring response:

> *The winner of the Eugene marathon was faster than the winner of the Doha marathon due to temperature being lower, 16 degrees compared to 32 degrees. The athlete in Doha would likely have suffered thermoregulatory fatigue. This resulted in an increase in blood flow to the skin, away from working muscles to cool down. As there is less oxygenated blood to the working muscles to produce ATP aerobically the athlete slows down.*

Question 7a.

Mark	0	1	2	3	4	Average
%	35	15	11	17	21	1.8

To be awarded full marks, students needed to use their understanding of impulse to compare how bowler A and bowler B vary the distance of their bowls.

Responses that scored highly used the variables of impulse (force and time) within the context of the two bowlers to explain the different performance outcomes.

The following is an example of a high-scoring response:

> *Impulse = force x time and refers to the change in momentum of an object. Bowler B uses a longer arm swing increasing their impulse by increasing time over which force is applied. This increases the distance the bowl travels. Bowler A however, decreases their impulse by decreasing the time over which force is applied when using a shorter arm swing, meaning the ball travels a shorter distance.*

Common issues included:

- discussing impulse being manipulated rather than increased or decreased
- saying that bowler B increased the force applied to the bowl
- not linking to the performance outcome of increasing or decreasing the distance the bowl travels.

Question 7b.

Mark	0	1	2	3	Average
%	35	20	22	24	1.4

Students were required to use Newton's second law of motion to explain why, when bowler B changes to a lighter set of bowls and uses the same arm swing, their bowl travels too far.

Responses that scored highly applied the equation $f = ma$ to the context of the question and explained that, when the same force is applied to objects with a different mass, the acceleration will be different.

The following is an example of a high-scoring response:

> *Newton's 2nd law states that a force applied to an object will cause a change in motion (acceleration) in the direction of the applied force, directly proportional to the force and inversely proportional to its mass (f=ma). A decrease in mass of the bowls while applying the same force will result in an increased acceleration of the bowl and it travels too far.*

Question 8

Mark	0	1	2	3	4	5	6	7	8	9	10	Average
%	11	9	14	18	19	13	8	5	2	1	0	3.4

Students were required to discuss the interrelationship between psychological strategies, energy system requirements, acute responses to exercise and oxygen consumption, and training methods and principles to produce a successful performance in the laser run.

Responses that scored highly demonstrated clear interrelationships between the four knowledge points and consistently linked their discussion back to the stimulus. Students linked knowledge points such as the energy system requirements with the appropriate training methods and described effective application of training principles. High-scoring responses also used the data to discuss appropriate psychological strategies, and linked oxygen consumption and acute responses to each phase of the laser run.

Some responses presented the knowledge points in isolation or focused on describing a variety of more general psychological strategies.

The following is an example of an ideal response:

> The modern pentathlon alternates between elevated heart rates during 1.52–2.26 minute runs and brief decreases during the laser-shooting phases. Both components benefit from arousal regulation strategies and aerobic training, as the aerobic system (large yield) is the major energy provider across the 11.26 minute event.
>
> At the start of each run, the athlete rapidly accelerates by increasing motor unit recruitment. Positive self-talk or cue words can optimise arousal for this explosive effort. Early in the run, oxygen demand exceeds supply despite acute responses such as increased tidal volume and heart rate working to increase oxygen consumption. This is reflected in heart-rate data rising from 110 bpm to ~160 bpm in run 1, indicating a period of oxygen deficit and greater reliance on the anaerobic systems (ATP–CP and anaerobic glycolysis).
>
> Although heart rate continues to rise and the athlete does not reach steady state, the aerobic system remains the major contributor. Improving aerobic power through sport-specific training such as long-interval training would increase the rate of aerobic ATP production and mimic the duration and intensity of the run segments. To gain these adaptations, the athlete must train within the aerobic zone (70–85% HR max.) and apply principles such as adequate frequency (e.g. three sessions per week).

Before shooting, the athlete needs to rapidly reduce arousal to enhance precision. As energy demand drops and heart rate decreases, strategies like slow, controlled breathing help lower arousal and extend the time between beats, improving accuracy. During this short low-intensity window (e.g. 8.20 seconds), the aerobic system begins to restore CP, but insufficient recovery time means CP is not fully replenished, increasing reliance on anaerobic glycolysis at the start of the next run.