

# VCE Physical Education

## Written examination – End of year

### Sample questions

These sample questions are intended to demonstrate how new aspects of Units 3 and 4 of VCE Physical Education may be examined. They do **not** constitute a full examination paper.

#### SECTION A – Multiple-choice questions

##### Question 1

Which one of the following is a serial skill?

- A. darts
- B. shot-put
- C. triple jump
- D. riding a bike

##### Question 2

A golfer takes a large back swing during a drive in order to increase the speed of the club.

Which biomechanical principle is being used by the golfer?

- A. inertia
- B. impulse
- C. projectile motion
- D. moment of inertia

##### Question 3

The mechanical advantage of a second-class lever system is used in which one of the following situations?

- A. squat
- B. bicep curl
- C. sit-up (upward phase)
- D. sit-up (downward phase)

**Question 4**

What changes in the moment of inertia and angular velocity occur when a diver tucks in during a somersault dive?

	<b>Moment of inertia</b>	<b>Angular velocity</b>
<b>A.</b>	decrease	increase
<b>B.</b>	increase	increase
<b>C.</b>	increase	decrease
<b>D.</b>	decrease	decrease

**Question 5**

Flexing the forearm at the elbow is an example of which type of lever?

- A. first-class
- B. second-class
- C. third-class
- D. depends on the resistance being applied

**Question 6**

Why does a learner in the cognitive stage of learning instinctively move their arms out to the side when on a balance beam?

- A. to increase agility
- B. to increase the force arm
- C. to increase stability by increasing the moment of inertia
- D. to increase stability by moving their centre of mass higher

**Question 7**

What type of movement skill does the sport of fencing use?

- A. open, fine, serial skill
- B. closed, gross, discrete skill
- C. open, gross, continuous skill
- D. closed, gross, continuous skill

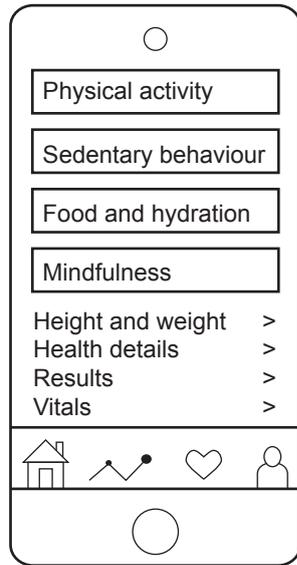
**Question 8**

Which one of the following scenarios gives an example of Newton's third law of angular motion?

- A. A wet football does not travel with the same acceleration as a dry football kicked with the same force.
- B. An athlete's arms move downwards and their legs move upwards during the flight phase of a long jump.
- C. A diver will continue to rotate at a constant angular velocity unless an external force acts on the body.
- D. An increase in the angular velocity of the leg when running will result in greater linear velocity of the body.

**Question 9**

The diagram below represents a physical activity tracking app on a mobile phone.



Based on the diagram above, which type of training data can the app record?

- A. sociological and psychological data
- B. physiological and sociological data
- C. physiological and psychological data
- D. physiological, psychological and sociological data

## SECTION B

### Question 1 (4 marks)

The 20 m shuttle run test is an appropriate fitness test for a group. One advantage of the 20 m shuttle run test is that it can test many subjects at the same time.

Explain **two** sociocultural factors that should be taken into consideration when conducting group testing.

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### Question 2 (16 marks)

Michael is training for a district long jump competition for athletes under 18 years of age. Images 1–4 below show Michael’s run-up in sequence.



**Image 1**



**Image 2**



**Image 3**



**Image 4**

- a. Identify the classification of movement skills shown in the images above by circling the correct option from each pair given below. 3 marks
- gross                      OR      fine
  - continuous              OR      discrete
  - open                        OR      closed

- b.** In terms of the conservation of angular momentum, explain the importance of the position of Michael's left leg in Image 2. 3 marks

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- c.** Identify and justify two fitness components that are essential for competing in the long jump at an elite level. 4 marks

Fitness component 1 \_\_\_\_\_

Justification \_\_\_\_\_

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Fitness component 2 \_\_\_\_\_

Justification \_\_\_\_\_

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- d.** Images 1, 2 and 3 show when Michael's leg is in contact with the ground, which determines stride length, a factor in determining speed.

Explain the importance of stride length in terms of impulse. 3 marks

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- e. As Michael runs, his right leg moves forward at the same time as his left arm.

Using Newton's third law of motion, explain the importance of these actions.

3 marks

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**Question 3** (8 marks)

The table below shows the 100 m times, mass and initiation of body movement for the four fastest finalists at the 2009 IAAF World Championships in Athletics in Berlin.

Athlete	Fastest 100 m time (sec.)	Mass (kg)	Initiation of body movement (sec.)
Usain Bolt	9.58	94	0.146
Tyson Gay	9.71	75	0.144
Asafa Powell	9.84	87	0.134
Daniel Bailey	9.93	68	0.129

- a. Using the data in the table above, apply Newton’s first and second laws of motion to the starting action of the 100 m sprint.

4 marks

Newton’s first law of motion \_\_\_\_\_

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Newton’s second law of motion \_\_\_\_\_

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- b. Jamaica has produced some of the top male and female 100 m runners in recent history.

Explain **two** possible sociocultural reasons for this.

4 marks

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**Question 4** (3 marks)

A relatively new training method involves bouts of maximal effort (greater than 90% HR max.) lasting 10–30 seconds, followed by periods of lower-intensity recovery.

- a. Identify the training method described above. 1 mark

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- b. What is the main energy system targeted by this training method? 1 mark

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- c. Outline **one** benefit that this training method has over others that target the same energy system. 1 mark

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**Question 5** (6 marks)

The record for the men’s 100 m sprint has improved at a steady rate between the inaugural modern Olympic Games in Athens in 1896 and the 1968 Olympic Games in Mexico City. Below are some examples of the changing practices associated with the 100 m sprint and the corresponding fastest recorded time.

Year	Modification	Previous practices	Fastest time recorded (sec.)
1896	Thomas Burke used a crouch start position for the first time.	Athletes started from a standing, often side-on, stance.	11.8
1900	Athletes began training regularly, with a specific focus on sprinting.	Athletes used training methodologies for physical preparedness.	10.8
1904	Athletes practised and developed specific starting and finishing techniques for the race.	Athletes started without a practised start technique or ‘lunge at the finish line’ skill technique.	10.6
1936	Athletes trained using a body angle of 45 degrees for the acceleration phase of the race.	Athletes moved from the crouch start position to a standing position as quickly as possible.	10.3
1948	Starting blocks were used for the first time.	Athletes dug holes with a garden trowel for their feet to fit in.	10.3
1964	Power training for athletes was widely adopted.	It was believed that light-framed athletes were better at sprinting.	10.0
1968	For the first time a synthetic track was used in an international competition.	Compressed ash and soil were used to create a softer track. These tracks were different at each venue.	9.95

Analyse the data provided above to determine the impact of **two** significant biomechanical modifications that led to an improvement in performance in the men’s 100 m sprint at the Olympic Games held between 1896 and 1968.

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**Question 7** (9 marks)

Consider the movement skills performed in the images below. The young child in Image 1 and Image 2 is demonstrating the basic movement pattern needed to perform a handstand. The adult in Image 3 is executing a complex movement skill.



**Image 1**



**Image 2**



**Image 3**

Sources: VaLiza/Shutterstock.com (Image 1 and Image 2); ITALO/Shutterstock.com (Image 3)

- a. Identify the stage of learning the child in Image 1 and Image 2 is demonstrating. 1 mark

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- b. Outline **three** characteristics of the stage of learning identified in **part a**. 3 marks

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- c.** With reference to all three images on page 13, discuss the relationship between skill progression and the biomechanical principle of stability for the handstand. 3 marks

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- d.** Feedback provides the adult gymnast in Image 3 with information that he can use to improve his performance. 2 marks
- Explain what information the gymnast would receive from his 'knowledge of performance' and why it is important during his routine.

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**Question 8** (9 marks)

The Australian Football League Women’s (AFLW) Draft Combine is an event at which potential draftees display their athletic capacities and relevant Australian Rules football skills. Participants are required to undergo a series of medical, psychological, motor skill, athletic and fitness tests.

The tests include the following:

- Yo-Yo intermittent recovery test
- a 2 km time trial
- an agility test
- a 20 m sprint
- a running vertical jump
- a standing vertical jump
- skinfolds, height and weight

a. The AFLW Draft Combine requires players to keep detailed training records.

Explain the importance of maintaining both physiological and psychological training records. 3 marks

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**Question 9** (8 marks)

The image below shows students assisting other students while exercising.



Source: wavebreakmedia/Shutterstock.com

- a. Identify the fitness test that is most likely being undertaken in the image above. 1 mark

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- b. Identify the fitness component that is probably being assessed by the test identified in **part a**. Outline **two** factors that affect this fitness component. 3 marks

Fitness component \_\_\_\_\_

Factors \_\_\_\_\_

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\_\_\_\_\_

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- c. How does informed consent apply to the fitness test shown in the image above? 2 marks

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- d.** With reference to Newton's third law of motion, explain why the fitness test is undertaken with one partner holding the other's feet.

2 marks

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**Question 11** (5 marks)

In a group fitness session, participants are expected to complete the following program of exercises.

**Warm-up**

10 minutes of continuous cycling on a stationary bike

**Conditioning phase**

Each of the following exercises, with a 60-second rest between sets:

- 10 push-ups (three sets)
- 30 sit-ups (three sets)
- 10 kettle bell swings (three sets)
- 12 squats (three sets)
- 15 calf raises (three sets)

**Cool-down**

- a five-minute walk
- a static stretch (major muscles)

a. What type of training is demonstrated in the program above? 1 mark

\_\_\_\_\_

b. i. Select one of the exercises from the conditioning phase in the program above and provide a suitable modification to increase or decrease the difficulty of the exercise to cater for differences in the fitness levels of the group participants. 1 mark

Selected exercise \_\_\_\_\_

Modification \_\_\_\_\_

\_\_\_\_\_

ii. Explain how the application of a biomechanical principle results in the exercise being made easier or more difficult. You may use a diagram to support your answer. 3 marks

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**Question 14** (6 marks)

- a. List an individual, a task and an environmental constraint that may influence the motor skill development of an under-10 soccer team.

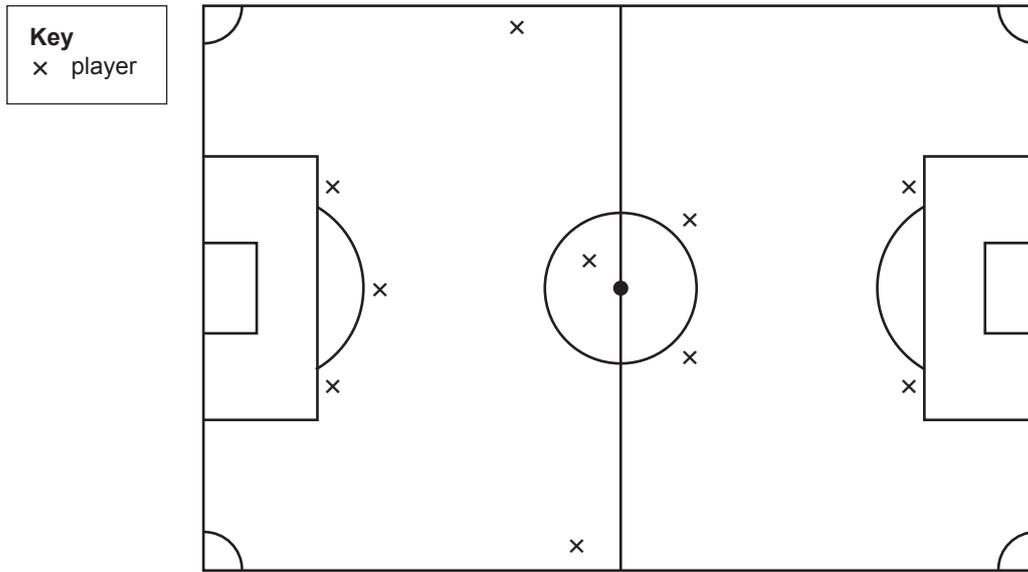
3 marks

Individual constraint \_\_\_\_\_

Task constraint \_\_\_\_\_

Environmental constraint \_\_\_\_\_

The coach of the under-10 soccer team has the following drill set up for the players on a full-size pitch. Teams of five are playing ‘keepings off’.



- b. i.** Provide an example of a modification to the drill shown in the image above that manipulates one of the constraints identified in **part a.** 1 mark

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- ii.** Explain how the modification provided in **part b.i.** may positively influence the motor skill development of the under-10 soccer team. 2 marks

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## Answers to multiple-choice questions

Question	Answer
1	C
2	B
3	D
4	A
5	C
6	C
7	C
8	B
9	C