VICTORIAN CURRICULUM AND ASSESSMENT AUTHORITY

Victorian Certificate of Education 2011

SUPERVISOR TO ATTACH PROCESSING LABEL HERE

STUDENT NUMBER

									Letter
Figures									
Words									

PHYSICAL EDUCATION

Written examination

Monday 14 November 2011

Reading time: 3.00 pm to 3.15 pm (15 minutes)
Writing time: 3.15 pm to 5.15 pm (2 hours)

QUESTION AND ANSWER BOOK

Structure of book

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 white out liquid/tape.
- No calculator is allowed in this examination.

Materials supplied
- Question and answer book of 21 pages.
- Answer sheet for multiple-choice questions.

Instructions
- Write your **student number** in the space provided above on this page.
- Check that your **name** and **student number** as printed on your answer sheet for multiple-choice questions are correct, **and** sign your name in the space provided to verify this.
- 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 book.

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

As the coach, you are completing fitness testing on an under-15 soccer team. Some of your friends have siblings in the team. Your friends know you are completing the testing and ask you about how their brother or sister performed in the test.

As the person conducting the test, what do you need to consider about releasing information about the results?

A. accuracy

B. reliability

C. specificity

D. confidentiality

Question 2

Eloise's goal in netball this year is to become a premiership player and achieve a top five finish in her team's best and fairest count.

Her goal is an example of

A. a process goal.

B. a sensible goal.

C. an outcome goal.

D. a performance goal.

Question 3

A 3-km runner wants to participate in the sport of cross-country running. He begins a training program running 5 km once a week at 70% of heart rate max. After four months he notices little improvement in his race time.

Which is the most likely training principle that has **not** been implemented correctly into his program?

A. duration

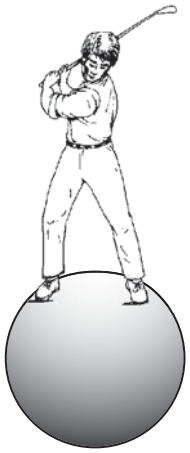
B. intensity

C. frequency

D. specificity

Use the following information to answer Questions 4–6.

The golfer below is performing swissball training.



Question 4

By completing a golf swing at a reduced speed from the top of a swissball, which of the following is this athlete trying to develop?

A. balance and core strength

B. balance and muscular power

C. muscular power and strength

D. flexibility and muscular power

Question 5

What other method can improve the fitness components being developed in the image above?

A. yoga

B. pilates

C. plyometrics

D. ballistic stretching

Question 6

Two physiological benefits of swissball training for a golfer may include

A. improved accuracy through the development of strength.

B. improved stability and ability to control movement when off balance.

C. increased flexibility and range of motion of the major joints involved in golf.

D. improved concentration and ability to focus on the golf ball when striking the ball.

Question 7

The ‘inverted U’ theory of optimal arousal states that

A. as arousal decreases performance increases.

B. there is an optimal level of arousal for optimal performance.

C. there is an optimal level of performance that creates optimal arousal.

D. the relationship between arousal and performance is a direct linear relationship.

Question 8

In which of the following exercises does the load change as the exercise progresses?

A. the up phase of a chin up

B. the down phase of a push up

C. sitting down performing a static hamstring stretch

D. the up phase of a leg extension using a Cybex machine

Question 9

Which sports drinks contain comparable concentrations of carbohydrates and electrolytes to the human body?

A. caffeine drinks, as they are rapidly absorbed by the body

B. isotonic drinks, as they have the same osmolality as the body

C. hypotonic drinks, as they have lower osmolality than the body

D. hypertonic drinks, as they have higher osmolality than the body

Question 10

The Hawthorn Football Club's training ground was redesigned so that the size was exactly the same as its home playing ground, the Melbourne Cricket Ground (MCG).

The strategy of replicating the game setting in training is called

A. simulation.

B. mental imagery.

C. mental rehearsal.

D. confidence building.

Question 11

At rest, the arteriovenous oxygen difference (a-VO_2 diff.) is

A. less than during exercise.

B. the same as during exercise.

C. greater than during exercise because O_2 is redistributed to vital organs.

D. greater than during exercise because O_2 consumption increases to repay excess post-exercise oxygen consumption (EPOC).

Question 12

Which food and drink list below would be the most suitable list for an elite tennis player to consume immediately post match to aid the replenishment of muscle fuel stores?

A. honey on bread, jube lollies, sports gel

B. crumpets, barley, apple juice, baked beans

C. apple juice, fruit bars, corn chips, noodles

D. baked beans, chips, skim milk, peanuts

Use the following information to answer Questions 13–15.

Leanne, 40 years old, is a 'weekend warrior' – a term used to describe individuals who participate in physical activity on Saturday and Sunday but are relatively sedentary Monday to Friday. Leanne travels over an hour to and from work, where she sits in an office working at a computer. On Saturday mornings, Leanne goes to a group fitness training session and does continuous and resistance training for an hour. She then does a 40-minute continuous running session in the afternoon. On Sundays she runs on her own, generally running 10–15 km. The cost of community-based fun run events deter Leanne from entering.

Question 13

The most accessible and suitable method for determining if Leanne meets the National Physical Activity Guidelines would be

A. pedometry.

B. accelerometry.

C. self-report diary.

D. direct observation.

Question 14

The amount of time Leanne spends exhibiting sedentary behaviour would include

A. when she is not physically active.

B. physical activity that is less than 30 minutes.

C. activities that do not allow her to meet the national physical activity guidelines.

D. activities that do not increase her energy expenditure substantially above resting levels.

Question 15

Which of the following is a factor, within the policy level of influence, that could be targeted by her employer to increase Leanne's physical activity levels at work?

A. implementation of 'walk and talk' meetings

B. provide access to shower and change facilities

C. educational programs explaining the benefits of regular physical activity

D. social support for employees who participate in lunchtime walking groups

END OF SECTION A
TURN OVER

SECTION B – Short answer questions

Instructions for Section B

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

Question 1

Due to copyright restriction,
this material is not supplied.

a. Identify two by-products of the chemical process undertaken by A on the graph.

1. _____

2. _____

2 marks

b. **i.** On the graph, which two lines represent the two anaerobic pathways (A, B or C)? Place your answer in the first column of the table below.

Anaerobic pathways (A, B or C)	Intensity	Duration	Fuel
	Maximal (>95%)		
	Maximal (>85%)		

ii. State the duration and fuel required for the anaerobic pathways identified in **part b. i.** by completing the table above.

2 + 4 = 6 marks

Question 2

The causes of fatigue during exercise are multi-factorial. Fuel depletion is one cause of fatigue during exercise.

a. List three **factors** that affect the rate of fuel depletion during exercise.

1. _____

2. _____

3. _____

3 marks

b. Select two **strategies** that may be used to delay fatigue caused by fuel depletion and explain why physiologically the strategy is thought to work.

Strategy _____

Explanation _____

_____

_____

Strategy _____

Explanation _____

_____

_____

4 marks

Question 3

Blood test results taken from four 26-year-old males under regulated conditions are given in the table below. The subjects were

- an elite 1500-m runner
- an elite high jumper
- a sedentary individual
- an elite cross-country skier.

Test results	Subject A	Subject B	Subject C	Subject D
Haematocrit (% of red blood cells in blood)	50	54	37	45
Haemoglobin count (g/dl)	16.5	18.5	12.5	14.0
Red blood cells (cells/mcL)	5.7	5.9	4.0	5.0

a. **i.** From the data provided in the table, which subject (A, B, C or D) is most likely to be the elite male cross-country skier?

_____

ii. Justify your answer with reference to the data.

_____

_____

_____

_____

_____

_____

_____

1 + 3 = 4 marks

Cyclists in the Tour de France have in the past used erythropoietin (EPO) to artificially manipulate their haematocrit and haemoglobin counts.

b. What is EPO and how does it physiologically enhance the performance of an elite distance cyclist?

_____

_____

_____

_____

_____

3 marks

It is alleged that cyclists using EPO will set their alarm each night to wake them in the middle of their sleep. They then ride for 10 minutes, on a stationary bike, before returning to their beds to resume sleep.

c. Outline a potential harm associated with the use of EPO and explain how the strategy given above is designed to alleviate the problem.

3 marks

There has been a sharp increase in the number of athletes who have been caught using EPO since the year 2000.

d. Provide **two** reasons that could explain why there has been an increase.

2 marks

Hypoxic tents are a legal practice which may produce a similar physiological benefit to EPO.

e. Describe how an athlete may utilise a hypoxic tent as part of their preparation for an event.

2 marks

Question 4

CycleSmart

The average Australian adult needs to exercise for about 30 minutes a day to maintain good health. An easy way to build this into any daily routine is by cycling to work.

CycleSmart is a multifaceted online tool that can be used to encourage people to change their travel behaviour. It was developed by TravelSmart Victoria to specifically encourage employees to cycle all or part of the way to work.

CycleSmart requires participants to use a cycle computer to calculate their daily kilometres. Cycle computers are great motivators because individuals can see how far they have cycled and track their progress over time. Anyone with a cycle computer can register on the CycleSmart website and enter the kilometres they have travelled. Participants can set daily or weekly email prompts to remind them to enter their kilometres and also elect to receive regular news updates, handy tips and useful advice.

TravelSmart Victoria encourages the use of CycleSmart at Victorian workplaces that are part of a travel planning program by

- creating an account or internal site on the CycleSmart website
- assisting workplaces to develop site-specific information
- surveying participating staff on their current travel behaviour
- measuring how this behaviour changes over time
- reporting on overall staff cycling performance
- providing information on purchasing cost-effective cycle computers.

www.transport.vic.gov

a. Identify the three remaining components in the social-ecological model, and provide an outline of an example of each component, accounting for how that component may influence an employee's involvement in the CycleSmart initiative.

The first component has been completed for you as an example.

Component: Individual

Example and explanation: Motor skills – an individual's level of competence in riding a bike will influence their ability to participate in this program.

Component _____

Example and explanation _____

_____

_____

Component _____

Example and explanation _____

_____

_____

Component _____

Example and explanation _____

_____

_____

6 marks

b. Discuss the relationship between the multiple levels of influence of the social-ecological model using the CycleSmart initiative as an example.

_____

_____

_____

_____

_____

_____

_____

3 marks

Question 5

Bruno, a 40-year-old male, has been training for nine months to complete his first marathon. He hopes to complete the marathon in three and a half hours. On the day of the marathon the predicted temperature is 29 °C. The temperature peaks during the event at 35 °C. Bruno has trained in much lower temperatures and is not acclimatised to the conditions.

Despite following his normal hydration plan, at the 21-km mark of the marathon Bruno is fatiguing badly and slowing down. He is sweating, complaining of headaches and dizziness, and his pulse is abnormally high.

a. What is the most likely physiological cause of Bruno's fatigue?

1 mark

b. Discuss the physiological process that has led to this condition and explain why Bruno has slowed down.

3 marks

Many athletes required medical intervention upon completion of the marathon. Some were intravenously hydrated by ambulance officers after the race.

c. Compare and contrast the hydration **methods** of consuming water orally and intravenous hydration.

4 marks

Question 6

Muscular power, strength and endurance (local) are all fitness components that relate to specific capabilities of skeletal muscles.

a. In the table below provide a definition, an example of a recognised fitness test and a specific training method, for each component of fitness. Some answers have already been completed. Each training method must be **different**.

Component of fitness	Definition	Example of a recognised fitness test	Specific training method
Muscular power			
Muscular strength		1 RM bench press	Weight/resistance training
Muscular endurance (local)	Ability of a muscle or muscle group to perform repeated muscular contractions		

6 marks

b. List two factors and explain how each factor affects the strength of a muscle.

Factor 1 _____

Explanation _____

_____

_____

Factor 2 _____

Explanation _____

_____

_____

4 marks

Question 7

A local school runs an annual triathlon that involves students from all year levels and fitness abilities. The triathlon involves a 400-m swim, 10-km bike ride and 4-km run. The following is a description of two Year 10 students who competed this year.

Student	Description
Tiffany	Tiffany has been entering and competing in triathlons for two years. A year ago she joined a triathlon club and recently came third in her age group at a locally sponsored triathlon. Her coach believes she has great potential in the sport based on the improvement she has made in the last two years. Tiffany has an average resting heart rate of 55 beats per minute.
Michelle	Michelle does not play competition sport but recently joined a gym to improve her fitness and self-esteem. Her initial fitness assessment from the gym rated her fitness as average. The training program designed by the gym instructor involved basic weights as well as various aerobic machines to improve her aerobic fitness. Michelle has an average resting heart rate of 75 beats per minute.

One minute prior to the start of the triathlon both girls have a heart rate in the range of 100–120 beats per minute.

a. Outline two reasons for the increase in heart rate from resting levels.

1. _____

_____

2. _____

_____

2 marks

b. **i.** List two types of data that could be collected as part of an activity analysis on a triathlon.

1. _____

2. _____

ii. From the data given in **part b. i.**, explain how a coach could use the information in designing a training program for an athlete.

_____

_____

_____

_____

_____

_____

_____

_____

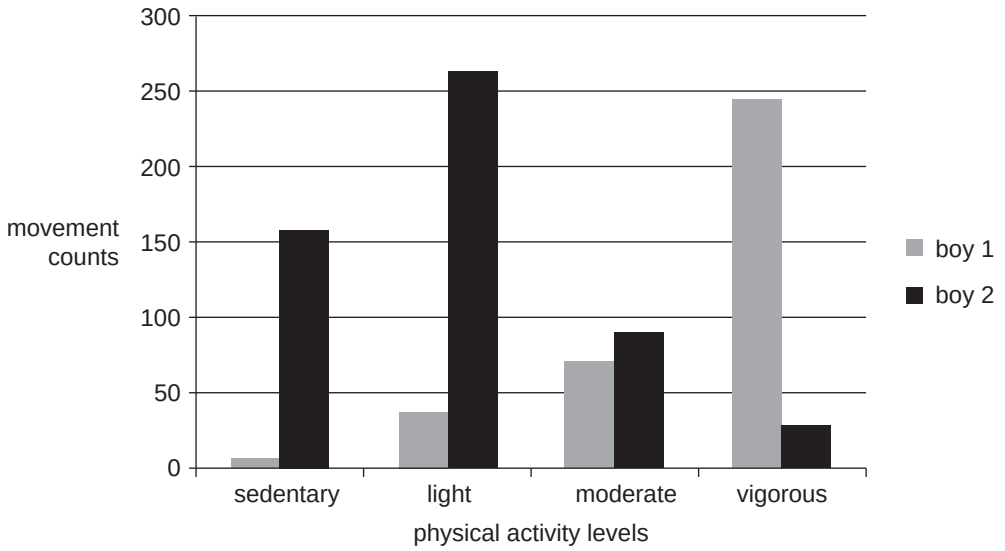
2 + 4 = 6 marks

c. Outline the requirements of informed consent in relation to conducting a VO_2 max. test at a sports science laboratory on a 19-year-old triathlete compared to conducting the test on the two Year 10 students.

2 marks

Question 8

Accelerometer data was collected from two eleven-year-old boys. The two boys are in Year 6 at two different primary schools in the same suburb. The data was collected during lunchtime on the same day. The data is shown in the graph below.



a. Using the information in the graph, describe the activity patterns of boy 1 throughout lunchtime.

3 marks

b. Using the data, suggest two likely reasons for the difference between the two boys in terms of their physical environment.

1.

2.

2 marks

c. Name and outline a population-based government or nongovernment initiative or strategy that could be implemented in schools to increase the physical activity levels of primary school aged children.

2 marks

Question 9

Cardiac output is the combination of two factors.

a. List the two factors. Do not use abbreviations in your answer.

2 marks

b. Describe the relationship between cardiac output and oxygen uptake, and the role of the two factors listed in **part a.**, when moving from a resting state to exercising.

3 marks

Question 10

Tim, Harry and Nadia are Year 12 physical education students who want to determine the physical activity levels and sedentary behaviour patterns of 100 Year 1 students (6 years old) in their school to determine if they are meeting the national physical activity guidelines.

The students have pedometers, accelerometers and a 5-day physical activity recall questionnaire available to use. Tim suggests that a pedometer is the most appropriate tool to use; Nadia disagrees and thinks an accelerometer is a better choice and Harry suggests that the questionnaire would be the best choice.

Compare the use of pedometers, accelerometers and a 5-day physical activity questionnaire. Other than cost, describe the relevant advantages and limitations, and recommend the most suitable method for the students to use with the Year 1 students.

7 marks

Question 11

Male swimming records (50-metre pool)

Freestyle event	World record	Australian national record	Recreational swimmer
50 m	20.91 seconds	21.19 seconds	29.45 seconds
100 m	46.91 seconds	47.05 seconds	1:04.36 minutes
200 m	1:42.00 minutes	1:44.06 minutes	2:25.76 minutes
400 m	3:40.07 minutes	3:40.08 minutes	5:36.52 minutes
800 m	7:32.12 minutes	7:38.65 minutes	11:57.13 minutes
1500 m	14:34.56 minutes	14:34.56 minutes	21:59.37 minutes

a. For each of the following freestyle events, identify a **different** health-related fitness component needed to complete each event.

50-metre freestyle _____

800-metre freestyle _____

1500-metre freestyle _____

3 marks

b. A chronic respiratory adaptation to aerobic training is an increase in pulmonary diffusion.

i. State what occurs physiologically with an increase in pulmonary diffusion.

_____

_____

ii. Identify and explain how one chronic cardiovascular and one chronic muscular adaptation enables the 1500-metre swimmer to utilise the benefits provided by an increase in pulmonary diffusion.

Cardiovascular adaptation _____

Explanation _____

_____

_____

Muscular adaptation _____

Explanation _____

_____

_____

1 + 4 = 5 marks

The world record for the 100-metre swim is 46.91seconds compared to the 400-metre record of 3:40.07 minutes. It takes the 400-metre swimmer approximately 51 seconds to complete each 100-metre split.

c. Explain why this occurs by discussing energy system interplay and by making reference to the data provided.

4 marks

d. Compare an interval training program for a 1500-metre freestyler to a 50-metre freestyler. Make reference to the work to rest ratio (W:R) and one other variable of an interval training program.

4 marks

As part of the Australian national record holder's training for the 100-metre freestyle, the swimmer trains at 75–90% of VO_2 max.

e. Discuss why the 100-metre swimmer trains at this intensity and how this intensity affects performance and blood lactate levels at the end of a 100-metre swim.

4 marks

END OF QUESTION AND ANSWER BOOK