



Units 3 and 4 Physical Education

Practice Exam Solutions

Stop!

Don't look at these solutions until you have attempted the exam.

Any questions?

Check the Engage website for updated solutions, then email practiceexams@ee.org.au.

Section A – Multiple-choice questions

Question 1

The correct answer is B.

Question 2

The correct answer is C.

Question 3

The correct answer is B.

Question 4

The correct answer is A.

Question 5

The correct answer is D.

Question 6

The correct answer is C.

Question 7

The correct answer is A.

Question 8

The correct answer is B.

Question 9

The correct answer is C.

Question 10

The correct answer is D.

Question 11

The correct answer is D.

Question 12

The correct answer is C.

Question 13

The correct answer is A.

Question 14

The correct answer is B.

Question 15

The correct answer is D.

Section B – Short-answer questions

Question 1

Proxy report is more appropriate [1]

Plus [1] for any of the following: [3] in total

- Direct observation is the most accurate measure of the two
- The proxy report is more practical in terms of cost and easily administered to large groups
- Direct observation is highly intrusive, labour-intensive and time consuming
- A proxy report is still reasonably accurate- it is able to assess type, frequency, intensity and duration of physical activity as well as the multiple domains
- Direct observation can be costly if personnel need to be trained
- Direct observation can be affected by reactivity
- A proxy report can be affected by social desirability bias

Question 2a

[2] for any 2 of the following, with responses targeting 13-16 y/o boys and reflecting the aesthetics, safety & accessibility of structures such as:

- Construct outdoor facilities, such as a skate parks & basketball courts
- Construct indoor facilities, such as tennis courts, gym, etc.
- Install &/or improve the aesthetics & safety of walking/bike tracks
- Provide open park space for sports such as AFL/soccer/Frisbee, etc.

Question 2b

The intervention may have a greater chance of success if a multi-factorial approach is adopted where all 4 levels of the SEM are targeted [1] such as;

- Social environment- organising a social basketball competition to promote physical activity with friends or employing a coach to help encourage and motivate the boys to play basketball [1]
- Policy - the local council could provide funding to assist the development of a sports club [1]
- Individual – The council could develop the awareness of the benefits of participation in physical activity & reducing sedentary behaviour [1]

Question 3a

[1] for any one of the following:

- Equipment such as balls available for use
- Access to playgrounds, sports courts and grass or park space
- Active transport systems

Question 3b

[1] for any one of the following:

- Mandated PE classes
- Government funding of such as Jump Rope for Heart in primary schools
- Laws such as reduced speed limits around school zones
- Walking/Cycling School Bus

Question 3c

[1] for any one of the following:

- Social lunchtime activities and games run by peer leaders
- Encouraging parental support through mediated activities

Question 4a

Respiratory	Cardiovascular	Muscular
Increased Ventilation [1] Increases the volume of oxygen in the lungs that can be diffused into the blood and transported to the working muscles from the alveoli by increasing tidal volume & respiratory rate [1]	Increased cardiac output [1] This improves performance by increasing the amount of blood being ejected out of the heart per beat & increased heart rate and therefore more oxygen can be delivered to the muscles [1]	Increased motor unit recruitment [1] This improves performance due to the brain sending more electric impulses to the muscle fibres to allow for increased muscle contraction [1]
Increased pulmonary diffusion [1] This is the movement of molecules from high concentration to low concentration & it improves performance by increasing the transfer of oxygen into the blood stream and delivery to the muscle cells [1]	Increased blood flow to working muscles [1] This occurs through vasodilation which increases the diameter of the arterioles supplying the working muscles to allow more blood and oxygen to be available to improve performance [1]	Decreased energy substrates [1] Energy substrates decrease (PC, glycogen, triglycerides) because they are used as fuels by the energy systems to resynthesize ATP [1]

Question 4b i

Tidal volume (TV) is the amount of air inspired and expired in a breath [1]. Increased TV increases the amount of oxygen that is available so it allows for a faster removal of lactate, as oxygen is able to help break it down and stop the accumulation of lactate from exceeding removal [1].

Question 4b ii

Heart rate is the number of times the heart beats in a minute [1]. With an increase in heart rate, there is an increase in the speed at which the blood is pumped out of the heart and hence an increase in which oxygen is available to breakdown lactate in the blood [1].

Question 4b iii

AVO₂ difference is the difference in oxygen concentration in the arterioles compared with the venules [1]. The higher the AVO₂ difference the more oxygen that is being extracted from the blood that can then be used to breakdown and remove lactate before it can exceed LIP [1].

Question 5a

Cardiac output equals stroke volume multiplied by heart rate. A training adaptation to endurance training is a decrease in resting heart rate due to an increase in stroke volume at rest and submaximal levels [1] which gives no overall change to cardiac output at rest and submaximal levels [1].

Question 5b

The further increases in cardiac output from submaximal to maximal occur due to increases in heart rate [1] as stroke volume peaks and plateaus at maximal levels [1].

Question 6a

[1] for each of the following: [8] in total

- At all times, all three energy systems are working together to re-synthesis ATP
- As Kirsten starts, the body is in oxygen deficit as there is a lag before the body can aerobically produce sufficient ATP to meet the demand
- The ATP-PC system is predominant at the start and it provides the fastest rate of ATP re-synthesis but has a very limited yield and PC stores deplete within the first 6-10 seconds
- As this happens, the anaerobic glycolysis system takes over as the predominant energy supplier, supplying more than twice as much ATP than the ATP-PC system but at a slower rate due to more complex chemical reactions required to breakdown ATP
- As the 1500m run approaches 60 seconds the aerobic system become predominant, supplying the greatest amount of ATP re-synthesis for the rest of the run
- The aerobic system however provides a slower rate of ATP re-synthesis compared to the anaerobic systems due to many more complex chemical reactions because it uses oxygen
- As the race continues, Alice would reach a steady state where oxygen demand meets oxygen supply
- At periods of higher intensity such as surges & the sprint to the end, the greater need for ATP at a faster rate would see the anaerobic glycolysis system increase its contribution

Question 6b

The body increases its contribution of ATP re-synthesis provided by using the anaerobic energy systems [1], enabling Alice to work at the higher intensity [1].

Question 6c

Stretching helps return the muscles to their normal resting length by increasing the elasticity of the connective tissue [1] and help prevent delayed onset of muscle soreness [1].

Question 6d i

- Contrast water therapy [1]- alternating submersion of the body into cold and hot water [1]
- Cryotherapy [1]- therapeutic use of cold to cool the body, such as ice vests & ice packs [1]
- Thermotherapy [1]- use of heat, such as warm spas [1]

Question 6d ii

[2] for any two of the following, specifically linking each to the type of hydrotherapy:

- Thermotherapy & Contrast water therapy increases blood flow
- Increases removal of waste products
- Increases supply of oxygen
- Decreases acute inflammation from muscle damage & DOMS
- Reduces muscle spasm
- Increases muscle elasticity and ROM
- Increases neural transmission

Question 7a i

Pearson: Anaerobic capacity- the capacity to re-synthesis ATP without oxygen [1]
The Phosphate Recovery test [1]

Question 7a ii

Shelley: Aerobic capacity- the capacity to re-synthesis ATP with oxygen [1].
The beep test [1]

Question 7b i

B) Pearson: Short Interval training- short periods of work (less than 10-15 seconds) followed by longer rest periods (2-3 minutes) [1]

Question 7b ii

Shelley: Aerobic training- training continuously for longer than 20 minutes without rest breaks [1]

Question 8a i

Several components (such as aerobic capacity, coordination, anaerobic capacity & strength) are acceptable but answers must relate to the data & be health-related. An example is:

- Local Muscular Endurance [1] AFL players are repeatedly contracting the same muscle group for skills such as running, jumping and tackling and can be seen in the data for midfielders covering 12.3km in distance and applying 13 tackles [1].

Question 8a ii

Several components (such as aerobic capacity, coordination, anaerobic capacity & strength) are acceptable but answers must relate to the data & be skill related. An example is:

- Agility [1] midfielders often have to change direction for skills such as hard ball gets, tackling and getting possessions this can be seen by 492 changes of direction in the data [1].

Question 8b

From the data, midfielders sprint more often and have an overall faster average speed than the other playing positions [1], thus they require more time on the bench in order to replenish depleted fuel stores (such as PC) and oxidise metabolic waste products [1].

Question 8c

This is an example of active recovery [1]. Low intensity aerobic exercise enables the skeletal muscle pump to aid venous return to assist blood circulation around the body [1]. This allows more oxygen to speed up breakdown and removal of metabolic by-products to speed up recovery for the next period of work [1].

Question 8d i

Dehydration leads to reduced plasma volumes & increased blood viscosity which decreases blood flow & oxygen [1] and elevated body temperature thereby reducing the capacity to perform [1].

Question 8d ii

[3] for any 3 of the following:

- Drinking adequate fluid before, during and after exercise
- Training early in the morning or later at night when it is cooler
- Wearing loose, light weight clothing
- Modifying training/competition to acclimatize to the conditions
- Use cryotherapy during rest periods (such as an ice vest)

Question 8e i

- Caffeine can help stimulate the central nervous system [1], enhancing the recruitment of motor neurons which improves the physical ability of the player [1]
- Caffeine can increase the potential for fat oxidation [1] which can lead to glycogen sparing so the player can use glycogen later in the match for higher intensity efforts [1].

Question 8e ii

[2] for any 2 of the following:

- Hypertension
- Over arousal
- Headaches
- Irritability
- Heart irregularities
- Insomnia
- Dehydration

Question 9a

'X' placed to the right side of the peak of the inverted 'U' to indicate over-arousal

Question 9b

Any two of the following, must be able to complete the technique during a game:

- Breathing control [1] involves taking deep breaths and allows her to improve selective attention and focus on the game [1]
- Progressive muscle relaxation during substitutions or breaks [1] involves progressively contracting her muscles from head to toe and then gradually releasing the contraction, this helps to also decrease mental tension and regain focus [1]
- Meditation during breaks such as substitutions or breaks [1] involves the exercising of an individual's attention and improves concentration and focus [1]

Question 9c

Simulation training is when real life situations are practiced or experienced and aims to train the brain to cope with game situations such as the crowd or playing conditions [1]. This can improve performance by preparing the athletes to be able to mentally handle many different situations presented during the game which could cause over-arousal and stress [1].

Question 10a

Provides rapid release of glucose into the bloodstream for energy [1] which enables the cyclist to use glycogen as the primary fuel source for longer and therefore he is able to work at a higher intensity for longer without having to rely on fats which use more oxygen in order to breakdown and produces ATP at a slower rate [1].

Question 10b

Carbohydrate gels are highly concentrated high glycaemic index (GI) supplements and need water so that they can be absorbed quickly enough by the body to be effective [1] and the dilution helps to prevent gastric upset [1].

Question 10c

Isotonic sports drinks are preferred [1] throughout the race as they have the same osmolality as the body which rehydrates and refuels the body with an equal balance of carbohydrates and electrolytes [1].

Question 10d i

If a strategy or substance meets any two of the following three criteria it would be banned [1]: It has the capacity to improve performance [1]. It poses a health risk [1]. It violates the spirit of a fair sport [1].

Question 10d ii

EPO is a naturally produced hormone that stimulates red blood cell growth [1] & having more red blood cells increases the ability to transport & oxygen which increases aerobic capacity & oxidation of metabolic by-products which leads to improved performance [1].

Question 10d iii

Any two of the following, [1] each: hypertension, stroke, DVT, blood clotting, heart failure.

Question 11a

[2] for any two of the following:

- Determine predominant energy systems & fitness components
- Determine major muscle/muscle groups
- Determine predominant skills/muscle actions

Question 11b

[2] for any two of the following:

- Determine strengths & weaknesses of energy systems & fitness components
- Motivate the athletes
- Set a benchmark for comparison during &/or after the training program

Question 11c

To determine if the training program was successful by determining if there was improvement in energy systems & fitness components compared to the pre-tests [1].

Question 11d

[2] for any two of the following:

- Perform testing under the same conditions (time, temperature, environment, etc.)
- Perform the same tests in the same order
- Person should be in same state of health
- Person should wear same clothing