



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 D.

Question 3

The correct answer is C.

Question 4

The correct answer is A.

Question 5

The correct answer is C.

Question 6

The correct answer is B.

Question 7

The correct answer is D.

Question 8

The correct answer is A.

Question 9

The correct answer is D.

Question 10

The correct answer is D.

Question 11

The correct answer is B.

Question 12

The correct answer is A.

Question 13

The correct answer is C.

Question 14

The correct answer is B.

Question 15

The correct answer is A.

Section B – Short-answer questions

Marks allocated are indicated by a number in square brackets, for example, [1] indicates that the line is worth one mark.

Question 1

- People who do not already meet the physical activity guidelines require mostly cognitive processes to increase their level of physical activity, whereas those already meeting the guidelines require mostly behavioural strategies. [1]
- An example of a cognitive strategy could be to comprehend the benefits of physical activity, i.e. by understanding the health benefits of being active. [1]
- A behavioural strategy could be reminding yourself to be active, for example by leaving your runners and an encouraging note in view. [1]

Question 2a

- The first level of the model describes individual factors. [1]
- Two factors that may influence the children could be self-efficacy and socio-economic status. [1]
- The second level refers to social environment factors, [1] such as access to role models and support offered by parents. [1]
- The third level, physical environment factors, [1] may include active transport systems and access to playgrounds. [1]
- Finally, policy and organisational factors, [1] may include laws such as reduced speed limits around schools or organisational policies such as no playing on the school oval without teacher supervision. [1]

Question 2b

- Jump Rope for Heart would be a suitable program. [1]
- The program is successful at the individual level as it aims to improve self-efficacy by enhancing children's fitness and motor abilities through practicing to jump a rope. [1]
- It successfully targets interpersonal (social) factors by encouraging children to skin in teams and groups, thus providing them with social support. [1]
- The program is also effective at the physical environment level as it gives children new equipment as they receive a free jump rope for participating in the program. [1]
- It may be considered successful at the organisational and policy level as it offers children prizes and incentives when they raise a certain amount of money. [1]
- The program does not widely address physical environment factors. They could be more widely addressed by offering schools money to improve their sporting facilities rather than offering students prize incentives. [1]

Question 3a

- Bella's ventilation (the amount of air breathed in or out in one minute) [1] would have increased. [1]
- Diffusion is the movement of molecules from an area of higher concentration to one of lower concentration. [1]
- Bella's diffusion rates would have increased as her need for the delivery of oxygen and removal of carbon dioxide to and from the blood would have increased. [1]

Question 3b

- Cardiac output is the amount of blood pumped out of the heart in one minute. [1]
- It would have increased as a result of both an increase in heart rate and stroke volume. [1]
- An increase in $a-vO_2$ difference (the difference in oxygen concentration in the arterioles compared with the venuoles) would have resulted [1] as the working muscles would have begun extracting greater amounts of oxygen from the blood. [1]

Question 3c

- Bella would have experienced an increase blood flow to skeletal muscles as skeletal capillaries dilate to allow for increases in total muscle blood flow. [1]
- Bella would have an increased body temperature as heat is the by-product of the process of converting food fuel to energy. [1]

Question 4

- Venous return is a measure of the amount of blood returning to the heart per minute. [1]
- The muscle pump is a result of the contraction of the muscles causing the veins to constrict, thus forcing blood back to the heart. [1]
- The respiratory pump is caused by regular breathing which changes the pressure in the thorax and abdomen, causing them to fill and empty of blood. [1]
- Ven constriction of the veins forces blood towards the heart. [1]

Question 5a

- The glycaemic index (GI) ranks foods on a scale of 0 to 100, according to how much they raise blood sugar levels over a two hour period compared to pure glucose. [1]
- James should consume high GI foods [1] as these foods will release energy rapidly, thereby providing him with the burst of energy he needs. [1]
- Steward should consume low GI foods [1] as these will release energy slowly, thereby providing him with energy throughout his event. [1]

Question 5b

- Isotonic sports drinks contain the same concentration of electrolytes and fluids when compared with the body's fluids, thereby providing the body with both hydration and energy. [1]
- Hypertonic sports drinks contain a greater concentration of electrolytes than fluid when compared with the body's fluids. They are primarily used to supply energy. [1]
- Hypotonic drinks contain a greater concentration of fluids than electrolytes when compared with the body's fluids. They are used to rehydrate. [1]

Question 5c

Hypotonic. Dehydration is the greatest source of fatigue for events lasting over 20 minutes. [1]

Question 5d

Stewart should weigh himself [1] and consume 1 to 1.5 litres of water for every kilogram lost. [1]

Question 6a

- The type of activity being undertaken. [1]
- The muscle fibre type being used. [1]
- The types of muscular contraction occurring. [1]
- The intensity of the activity. [1]
- The duration of the activity. [1]
- The level of fitness or training adaptations of the performer. [1]

Question 6b

- Local fatigue is experienced in a muscle or a group of muscles localised in part of the body [1].
- In contrast, general fatigue is when muscles all around the body feel weakened. [1]
- Chronic fatigue is more concerning than local and general as it involves a breakdown of the immune system caused by overtraining. [1]

Question 7a

The ability of the heart, blood vessels and respiratory system to supply nutrients and oxygen to the muscles and the ability of the muscles to use the oxygen for sustained exercise. [1]

Question 7b

- The strength of the heart. [1]
- Capability of the muscle tissue to use oxygen. [1]
- Blood vessel state of health. [1]
- Level of haemoglobin. [1]

Question 7c

- Muscular power is the ability to exert a force rapidly over a short period of time. It is a combination of strength and speed. [1]
- Muscular strength is the maximal force that can be generated by a muscle in one maximal effort. [1]
- Muscular endurance is the ability of a muscle to hold a muscle contraction or to repeatedly perform a muscle contraction over a period of time. [1]
- Muscular strength produces the most force, then power and then endurance. [1]

Question 7d

- Flexibility is the capacity of a joint to move through its full range of motion. [1]
It is affected by:
- Joint structure [1]
- Soft-tissue structures (surrounding muscles, joints, tendons and ligaments) [1]
- Body and muscle temperature [1]
- Age [1]
- Gender [1]
- Body composition [1]

Question 8a

- Validity is the degree to which a test measures what it claims to measure. [1]
- Reliability is the ability of a test to produce consistent and repeatable results. [1]

Question 8b

Any three of the following:

- Tests should be conducted at the same time of day [1]
- The same warm-up should be conducted [1]
- The test should take place in the same environmental conditions [1]
- The same equipment should be used [1]

Question 9

	Muscular strength	Muscular power	Local muscular endurance
% of repetition maximum	80+	30 – 60	40 – 60
Sets	3 – 6	3 – 6	3 – 6
Repetitions	1 – 6	3 – 6	15 – 25
Speed	Slow	Fast	Medium
Recovery	2 – 3 mins	2 – 3 mins	1 min
Predominant energy system	ATP/PC	ATP/PC	Anaerobic glycolysis

[1+1+1+1+1+1]

Question 10a

- Variety. [1]

Question 10b

- Specificity. [1]
- Samantha should ensure that her running training involves the same energy system usage [1], fitness components [1], major muscle groups [1] and skills [1].

Question 10c

- Overload is a planned increase in training stimulus to cause a positive long-term adaptation. [1]
- One variable should be manipulated at a time [1] and overload should be between 2 and 10%. [1]

Question 10d

- The stretch-shortening cycle refers to the principle that any time there is a rapid eccentric muscle contraction the stretch reflex initiates a rapid concentric muscle contraction as a protective mechanism to prevent the muscle overstretching. [1]
- A strength base is recommended before commencement of plyometrics training. [1]
- It may cause micro-tears in the muscle so adequate rest is needed during and between sessions. [1]

Question 10e

- Static stretching is when a person stretches to a position and holds it for ten seconds or more. [1]
- Samantha may consider static stretching towards the end of her cool down. [1]
- Dynamic stretching involves moving a joint through its range of motion with controlled momentum. [1]
- Samantha should use this as part of her warm up. [1]
- Proprioceptive neuromuscular facilitation (PNF) stretching is when a muscle is gently moved through its full range of motion, then the muscle is contracted for six seconds before the performer stretches further. [1]
- Samantha should consider this towards the end of her cool down. [1]

Question 11a

- Oxygen travels from the lungs to the alveoli where it is picked up by haemoglobin. The haemoglobin travels in the bloodstream and carries the oxygen to the muscle. [1]
- Once at the muscle, the oxygen is transferred from the haemoglobin to the myoglobin which is inside the muscle. [1]
- The myoglobin transports the oxygen to the mitochondria where it is used in aerobic respiration.[1]

Question 11b

- An increase in the number and size of mitochondria. [1]
- An increase in the number of glycolytic enzymes. [1]
- An increase in muscle glycogen stores. [1]

Question 12a

- The substance or method has the potential to enhance, or enhances sporting performance. [1]
- The substance or method represents an actual or potential health risk to the athlete. [1]
- The substance or method violates the spirit of the sport described in the Code. [1]

Question 12b

Illegal substance	Benefits for athlete	Harm caused to athlete	Sports it is commonly used in
Stimulants	1. Improves anaerobic performance 2. Masks fatigue/ improves muscle reaction/ increases alertness and aggression	1. Dependence 2. Anxiety/ tremors/ cardiac arrhythmia/ heart attack	1. Athletics 2. Weightlifting
Diuretics	1. Masks use of anabolic steroids 2. Reduce body weight quickly	1. Cramps 2. Muscle strain	1. Boxing 2. Weight lifting
Beta-blockers	1. Reduces heart rate 2. Increase relaxation 3. Increase a-vO ₂ difference	1. Hypotension 2. Hypoglycaemia/ dangerous for asthmatics/ impotence	1. Shooting 2. Archery

[1+1+1+1+1+1]