INSIGHT

Trial Exam Paper

2011
PHYSICAL EDUCATION
Written examination

Sample responses

This book presents:

- correct sample responses
- mark allocation details
- explanatory notes
- tips

SECTION A – Multiple choice questions

Question 1
Which statement about the use of direct observation as a means of assessing physical activity is **not** true?

A. Direct observation is a time-consuming way of assessing physical activity.
B. **Direct observation is a subjective measure of physical activity.**
C. Direct observation is less accurate than accelerometers when it comes to assessing physical activity patterns.
D. SOPLAY is a system for measuring physical activity through direct observation.

Answer is B.

Explanatory Notes

- A, C and D are all true statements in regards to direct observation.
- B is false because direct observation is an objective measure of physical activity.

Question 2
A setting-based approach to physical activity promotion is seen as critical to achieving success in the population's participation rates.

Which of the following could **not** be regarded as a setting-based approach to physical activity promotion?

A. Walking School Bus program
B. Physical Education classes in a Secondary School
C. **the "Go for your Life" website**
D. the 10,000 Steps Challenge advocated at medical clinics by GPs for obese patients

Answer is C.

Explanatory Notes

- A, B and D are incorrect because they are setting-based approaches—the clientele is a "captive" audience.
- C is correct because it is not a setting-based approach, since the clientele is not a "captive" audience. The clientele has to visit the website and stop viewing the website at any time.

Question 3

Our body has 3 energy systems to produce ATP—aerobic, lactic acid, and ATP-CP. These 3 energy systems are able to generate ATP at different speeds as well as different yields. Which of the following statements is true in regards to the rate and yield of ATP production?

A. The ATP-PC system has the fastest rate of ATP production, as well as the largest yield relative to the other energy systems.

B. **Fat metabolised by the aerobic energy system has the slowest rate of ATP production, but can produce the largest yield relative to the anaerobic energy systems.**

C. Anaerobic glycolysis produces more ATP from a glucose molecule than aerobic glycolysis.

D. Anaerobic glycolysis has a faster rate of ATP production than the ATP-PC system.

Answer is B.

Explanatory Notes

- A is incorrect as the ATP-PC system generates the smallest yield of ATP relative to the other energy systems.
- C is incorrect as aerobic glycolysis produces more ATP than anaerobic glycolysis, through the addition of oxygen.
- D is incorrect as anaerobic glycolysis produces ATP at a slower rate than the ATP-PC system.

The image below relates to Questions 4 and 5.

Question 4

A cricket bowler preparing to run in and deliver the ball would have a focus which is

A. **broad internal.**
B. broad external.
C. narrow internal.
D. narrow external.

Answer is A.

Explanatory Notes

- A is correct as the bowler is focusing on his thoughts and feelings, which are internal.
- B, C and D are incorrect, as the bowler's focus is neither external nor narrow.

Question 5

A high-arm delivery relies on good flexibility in the shoulder joint. Which of the following is **not** a factor that will affect flexibility in the cricketer's shoulder joint in the future?

A. age
B. maintaining a stretching program
C. weight program designed to increase shoulder musculature
D. **aerobic capacity**

Answer is D.

Explanatory Notes

- A is incorrect because age is a factor that affects flexibility in the shoulder joint. As you get older, flexibility in the shoulder joint decreases.
- B is incorrect because maintaining a stretching program is a factor that affects flexibility in the shoulder joint. Flexibility in the shoulder joint can be maintained or improved through a regular stretching program.
- C is incorrect because a weight program designed to increase shoulder musculature is a factor that affects flexibility in the shoulder joint. Increasing the musculature of the shoulder will result in an overall decrease in flexibility of the shoulder joint.
- D is correct because aerobic capacity is **not** a factor of flexibility in the shoulder joint. It relates to a different fitness component.

Question 6

Craig Mottram is one of Australia's premier long-distance runners. Which of the following combinations of adaptations could Craig expect to see after an extended aerobic training program?

A. increase in (a-VO_2) difference during maximal exercise, increased capillarisation of muscle, increase in mitochondrial density, decrease in blood volume

B. **increase in (a-VO_2) difference during maximal exercise, increased capillarisation of muscle, increase in mitochondrial density, increase in blood volume**

C. decrease in (a-$_{VO2}$) difference during maximal exercise, increased capillarisation of muscle, increase in mitochondrial density, decrease in blood volume

D. decrease in (a-$_{VO2}$) difference during maximal exercise, increased capillarisation of muscle, increase in mitochondrial density, increase in blood volume

Answer is B.

Explanatory Notes

- A is incorrect as there is an increase in blood volume after aerobic training.
- B is correct as all of the adaptations mentioned occur as a result of aerobic training.
- C and D are incorrect as (a-VO2) difference increases as a result of aerobic training.

Question 7

A 100-metre runner completes a race in less than 10 seconds. What is the most likely cause of fatigue for this runner?

A. depletion of intramuscular glycogen stores

B. accumulation of hydrogen ions

C. **depletion of creatine phosphate stores**

D. dehydration

Answer is C.

Explanatory Notes

- A, B and D are all factors of fatigue associated with long-distance events.
- C is the only factor that could be responsible for fatigue in a 100-metre runner.

Question 8

Ice baths (or cryotherapy) is a modern form of recovery that can reduce the effects of post-competition dehydration by reducing the body's core temperature. Which of the following is another benefit associated with the use of cryotherapy?

A. **provision of an analgesic effect through the reduction of perceived pain or discomfort**
B. increase in blood flow
C. faster replenishment of creatine phosphate stores
D. decrease in excess post-exercise consumption

Answer is A.

Explanatory Notes

- A is correct because using an ice bath reduces the perception of pain and discomfort.
- B is incorrect because blood flow actually decreases when using cryotherapy.
- C is incorrect because faster replenishment of creatine phosphate stores only occurs with an increase in blood flow.
- D is incorrect because a decrease in EPOC is not relevant to this particular question.

Question 9

Archery is a sport that requires excellent accuracy to be successful. Some athletes may consider using illegal means to achieve greater accuracy with their shooting. Which of the following illegal ergogenic aids would be the most appropriate in achieving their aim?

A. diuretics
B. narcotic analgesics
C. **beta blockers**
D. erythropoietin (EPO)

Answer is C.

Explanatory Notes

- A is incorrect because diuretics are drugs associated with losing excess weight or masking steroid use.
- B is incorrect because narcotic analgesics are a group of drugs associated with masking pain.
- C is correct because beta blockers have the effect of decreasing tremors and relaxing the muscles, which would enable the archer to shoot more accurately.
- D is incorrect because erythropoietin is a drug associated with increasing VO_2 max of athletes.

Question 10

A socio-ecological model of influences on physical activity can be used to evaluate the things that affect how active an individual is. One factor that can affect an individual's activity patterns is having someone to be physically active with. Which category of physical activity intervention (of those shown below)would this factor come under?

A. intrapersonal
B. **interpersonal**
C. physical environment
D. policy

Answer is B.

Explanatory Notes

- A is incorrect, as the intrapersonal category relates to factors that relate to the individual.
- B is correct, as the interpersonal category relates to social influences which exercising with a friend would come under.
- C is incorrect because the physical environment category relates to factors concerning the physical environment.
- D is incorrect because the policy category relates to policies that may be instigated in terms of physical activity promotion.

Question 11

A change in the arteriovenous oxygen difference (a-vO2 difference) occurs as a result of a prolonged training regime. Which of the following statements is true in regards to the effect that training has on the arteriovenous difference during maximal exercise?

A. **The (a-vO2 diff) will be higher as a result of aerobic training.**
B. The (a-vO2 diff) will be lower as a result of aerobic training.
C. The (a-vO2 diff) will be higher as a result of anaerobic training.
D. The (a-vO2 diff) will be lower as a result of anaerobic training.

Answer is A.

Explanatory Notes

- A is correct because the more aerobically fit you become, the more oxygen is extracted out of the arterioles for the working muscles, leaving less in the venules for the return journey to the heart.
- B is incorrect, as the opposite effect will occur.
- C and D are incorrect, as anaerobic training will have no effect on the (a-vO2 difference).

Question 12

Aerobic glycolysis is the most efficient energy system in generating ATP for muscle activity. The net gain of ATP molecules produced due to the breakdown of glycogen is

A. 26.
B. **36.**
C. 38.
D. 42.

Answer is B.

Explanatory Notes

- A, C and D are incorrect as this is not the net gain of ATP molecules due to the breakdown of glycogen.
- B is correct as this is the net gain of ATP molecules in the aerobic breakdown of glycogen (38 are actually produced but 2 are consumed in the aerobic process).

Question 13

The table below demonstrates an interval training session used by an athlete during their program.

Sets	Repetitions	Intensity	Time period per set
3	6 x 10 seconds	95% HRmax	5 minutes

Each repetition was conducted with an equal recovery time between each bout of exercise up until the end of the five minutes per set.

What is the work-to-rest ratio for this short interval training session?

A. 1:3
B. **1:4**
C. 1:5
D. 1:6

Answer is B.

Explanatory Notes

- A, C and D are incorrect as these work-to-rest ratios do not correspond to the program stated above.
- B is the correct answer because effectively there are 60 seconds of work compared with 4 minutes of rest, which is a 1 min: 4 min ratio, hence 1:4.

Question 14

Goal-setting is a very good way to motivate athletes, particularly when aiming for long-term achievements during both training and competition. Elite athletes should record these goals and a simple way of doing this is using the acronym SMARTER. The letters of this acronym stand for

A. Specific, Measurable, Achievable, Realistic, Time-phased, Exciting, Recorded
B. Specific, Measurable, Achievable, Relative, Time-phased, Exciting, Recorded
C. Specific, Measurable, Accepted, Relative, Time-phased, Exciting, Recorded
D. **Specific, Measurable, Accepted, Realistic, Time-phased, Exciting, Recorded**

Answer is D.

Explanatory Notes

- A, B and C are not the correct words for this acronym.
- D shows the correct words used in this acronym for goal-setting.

Question 15

The role of the World Anti-Doping Agency (WADA) is to promote, monitor and co-ordinate the fight against illegal practices in world sport. To meet these goals, WADA developed the World Anti-Doping Code. Which of the following values is **not** found in the World-Anti-Doping Code?

A. excellence in performance
B. **friendship**
C. ethics, fair play and honesty
D. respect for rules and laws

Answer is B.

Explanatory Notes

- A, C and D are all values that underpin the World Anti-Doping Code.
- B is not a value of the World Anti-Doping Code.

Tip

- *Multiple-choice questions only represent ten percent of the exam and should only have the appropriate amount of time spent on them (15 minutes). If you cannot answer a question, leave it until the end of the exam when you can simply "tick a box". Most questions allow you to eliminate one or more answers so that if guesswork is involved, you can increase your chances of choosing the correct answer.*

END OF SECTION A

SECTION B – Short answer questions

Question 1
Students were asked to come up with a suitable test battery to evaluate the skills of an elite basketball player.

1a. In the table below, write the MOST suitable test for the relevant fitness component and a reason why that test was selected.

Fitness Component	Suitable test	Reason
Aerobic Capacity		
Muscular leg power		
Agility		

6 marks

Sample response

Fitness Component	Suitable test	Reason
Aerobic Capacity	*20m shuttle run test (beep test)*	*Mimics the movements of a basketball player more closely than the Cooper's 12 minute run (for example).*
Muscular leg power	*vertical jump*	*Vertical jump is a key skill in basketball for things such as rebounding, blocks and shooting.*
Agility	***a.*** *Illinois agility test* *OR* ***b.*** *Semo agility run*	*For **a:** test mimics general movement patterns on a basketball court* *For **b:** mimics the movements specifically used in defence in basketball*

1b. Why would it be advisable to evaluate an elite player's abilities in basketball before embarking on an intensive training program?

2 marks

Sample response

Testing an athlete's ability in basketball before commencing a training program is important to gain valuable base-line data that can be used in future to see whether a training program has been successful or to monitor progress during the program itself. A second acceptable response would be that testing will be done to identify areas of concern and cater a program around an individual's needs.

Total 6 + 2 = 8 marks

Tip

- *Students will need to know a minimum of two fitness tests for each component and why you would select a particular test over another (specificity). An understanding of what the fitness components are is essential to answering this question.*

Question 2

2a. Fill in the table below in relation to the movement occurring at the shoulder joint in the follow-through of the tennis serve, pictured above.

Movement (at shoulder joint)	
Agonist (1 muscle required)	
Antagonist (1 muscle required)	

3 marks

Sample response

Movement (at shoulder joint)	*shoulder flexion*
Agonist (1 muscle required)	*Pectoralis major, anterior deltoid*
Antagonist (1 muscle required)	*Latissimus dorsi, posterior deltoid*

2b. Why does the tennis player initially draw his arm back before making the serve?

2 marks

Sample response

The tennis player initially draws his arm back before making the serve because this movement creates a stretch in the pectoralis major, creating tension. This will allow the muscle to generate more force and will result in a faster serve.

Total 3 + 2 = 5 marks

Tip

- *This sort of question is the most likely to appear from the Unit 1 and 2 curriculum as it covers a broad range of topics. Students need to ensure they know all of the relevant terminology involved in this question, as it relates to the preparation of fitness programs studied in Unit 4.*

Question 3

There are a number of different ways in which physical activity patterns can be measured. List 4 differences between accelerometers and self-recall, both of which measure physical activity.

4 marks

Sample response

Differences between accelerometers and self-recall include

- Accelerometers are a lot more expensive to use than self-recall.
- Accelerometers are more accurate than self-recall questionnaires or diaries.
- Accelerators cannot be used in water activities, whereas self-recall can be used for all types.
- Accelerometers are an objective measure of physical activity, while self-recall is subjective.
- Accelerometers give you quantitative data while self-recall is usually qualitative (sometimes quantitative).
- Accelerometers can only be used with small numbers while self-recall is limitless in the number of participants easily accommodated.
- Self-recall can describe the type and context of physical activity, whereas accelerometers cannot provide this information.

Tip

- *Students need to know the differences between the various measures of physical activity; subjective or objective, quantitative or qualitative, accuracy versus practicality etc. Previous exams have commonly explored the differences between pedometers and accelerometers.*

Question 4

The socio-ecological model of influences on physical activity is important in considering how active an individual will be. Using a year 12 student who lives in your area as a subject, provide two examples in each box that relate to that particular influence on their behaviour in regards to physical activity.

Individual (Intrapersonal)		
Interpersonal (social)		
Natural environment		
Constructed environment		
Policy		

10 marks

Sample response
Answers might include:

Individual (Intrapersonal)	Self efficacy, self image, self concept, goal setting, age, gender, race	Confidence, knowledge, awareness of benefits
Interpersonal (social)	Coaching, family groups, friends, car-pooling	Developing relationships, teamwork, culture of social network
Natural environment	Opportunity for water sports (e.g. surfing, swimming, life-saving) weather patterns, geography	Natural walking tracks, beach walks, parklands
Constructed environment	Football ovals, gymnasiums, sporting facilities, ramps for wheelchair access	Swimming pools, constructed walking paths, shower facilities at schools
Policy	Compulsory physical education in schools, government programs promoting physical activity, after-school activity programs	Education programs provided in settings such as schools and workplace, designated areas for children to play at school, lower speed limits on roads to encourage cycling

Tip

- *The socio-ecological model is a new aspect of the course. It would be reasonable to assume that it will be assessed in the new exam in detail. Being able to categorise the different mediators is important when discussing the model.*

Question 5

In recent times, multiple gold medallist Marion Jones of the USA admitted she used steroids at the Sydney Olympic Games. The World Anti-Doping Agency (WADA) would have played a crucial role in detecting these doping offences.

5a. What is one type of drug Marion Jones might have used to mask her use of steroids?

1 mark

Sample response
Diuretics, epitestosterone, probenecid, plasma volume expanders

5b. What are two potential benefits of using illegal steroids in Olympic competition?

2 marks

Sample response
Increase in muscle bulk, power and strength. Increased aggression, increased speed of recovery and allows for more intense and longer training sessions.

5c. What are two potentially harmful side effects of using steroids?

2 marks

Sample response
Dependence, depression, cancer, hypertension, death, testicular/breast atrophy, facial hair, infertility, water/salt retention, higher LDL cholesterol

5d. Besides the possession or use of a prohibited substance or method, what are two other violations that are considered to be doping offences?

2 marks

Sample response
Other offences in violation of the WADA anti-doping code include
- Refusal to submit a sample or evade sample collection.
- Failure to file whereabouts and missed tests.
- Attempted/tampering with any part of the doping control process.

Total 1 + 2 + 2 + 2 = 7 marks

Tip

- *The use of drugs and the role of WADA or other drug-policing agencies is new to the course and will most likely be linked together. Side effects and other considerations need to be explored in relation to using illicit drugs.*

Question 6

Below is a table of some common foodstuffs and their relative glycaemic index.

High GI food (70-100)	**Medium GI food (55-69)**	**Low GI food (<55)**
Bananas Honey Fruit bars	Brown rice Carrots Pineapple	Baked beans Pears Yoghurt, low fat

6a. Give an example of a foodstuff above that should be consumed 3–4 hours before an endurance activity and explain why this is suitable.

2 marks

Sample response

Baked beans, pears, or yoghurt. Low GI foods provide a slow release of energy and this is ideal for endurance activities.

6b. Give an example of a foodstuff above that should be consumed within 30 minutes of completing an endurance activity and explain why this is suitable.

2 marks

Sample response

Bananas, honey or fruit bars. High GI foods are able to replenish carbohydrates at a faster rate and therefore increase the rate of recovery for an endurance athlete.

Carbohydrate loading can be used as a method for superior performance for an endurance athlete.

6c. Identify and explain one advantage of using carbohydrate loading for an endurance athlete.

2 marks

Sample response

Athletes will be able to prolong the use of their carbohydrate stores and rely less on burning fat. This means that they will be able to compete at a higher intensity for longer.

6d. Carbohydrate loading can also have a negative effect, especially for athletes who participate in team sports. Identify and briefly explain a disadvantage of carbohydrate-loading for an athlete involved in team sports.

2 marks

Sample response

Team sport athletes regularly play games which are not conducive to carbohydrate loading. Carbohydrate loading can also result in weight gain which may have an adverse effect on an athlete's performance. Most team sports do not extend beyond 2 hours of duration which would nullify any advantage carbohydrate loading could give.

Total 2 + 2 + 2 + 2 = 8 marks

Tip

- *The main point of this question is being able to identify at what times you would use high or low GI foods and in what circumstances. Carbohydrate loading is a common theme found in past exams and relates to dietary intake.*

Question 7

Sport	2002	2003	2004	2005	2006	2007	2008	2009	%change 2002-09
Walking	4720.3	5900.6	6168.1	5973.6	5811.3	5390.0	6508.4	6215.5	31.7
Aerobics/ fitness	2236.9	2487.2	2698.2	2959.7	3074.5	3303.0	3901.9	3932.4	75.8
Golf	1337.1	1282.0	1250.6	1139.3	1090.9	915.0	1181.1	1103.1	-17.5
Tennis	1260.5	1407.0	1323.2	1253.3	1100.7	951.2	1122.5	1093.3	-13.3

Adapted from the ERASS report for physical activity 2009, Australian Sports Commission. Figures are in millions.

7a. What could be said about the success of tennis programs run in the 8 years up to 2009?

1 mark

Sample response

The tennis programs have been unsuccessful due to a decrease in active participants.

7b. What would be the most effective way to make sure tennis programs reached a teenage target audience? Explain your answer.

2 marks

Sample response

A settings approach in schools would be the most appropriate. Students would be a "captive" audience and would receive exposure to the sport. Tennis authorities could facilitate these programs by providing gear and other support mechanisms (e.g. coaching, facilities) to assist schools in this area.

The six-week 10,000 steps challenge and other initiatives have helped to increase the numbers of people walking over the past few years.

7c. Apart from specific programs, what are two other strategies the government has employed to increase the numbers of people walking?

2 marks

Sample response

In an effort to increase the number of people walking, the Government has

- provided funding for walking track.
- supported the implementation of the walking bus program.
- provided organisations such as libraries where pedometers can be borrowed.
- alerted the community through media campaigns to the benefits of activity as well as the dangers of inactivity.

Aerobics/fitness training has seen a massive increase in the eight years up to 2009.

7d. What are two factors that may account for this growth in popularity?

2 marks

Sample response

Factors include

- These activities can be done indoors and are, therefore, not affected by weather.
- These activities do not take a lot of time to complete.
- People of all ages can participate in these activities.
- These activities are marketed fairly heavily through the media.

Total 1 + 2 + 2 + 2 = 7 marks

Tip

- *A major part of the Physical Education exam is being able to interpret tables and graphs. Students should practice as many types of these questions as they can to further their understanding. The second part of the question looks at the promotion of physical activity and the use of "settings".*

Question 8

Triathletes who compete in events for longer than two hours can have near resting lactic acid levels upon completion of the event.

8a. How is it possible for these athletes to have such low lactic acid levels after competing for such a long time?

2 marks

Sample response

Endurance athletes have superior aerobic capabilities compared with other athletes. The fact that there is more oxygen available to help remove the lactic acid means that levels can remain relatively low during performance. A second acceptable response would be that these athletes are spending the vast majority of their time predominantly using the aerobic energy system, which does not produce lactic acid.

8b. Identify and briefly explain two probable causes of fatigue for triathletes at the completion of these events.

4 marks

Sample response

Two probable causes of fatigue can include: depletion of glycogen, overheating and redistribution of blood flow, dehydration, presence of toxic by-products inside the muscle which inhibit the energy producing enzymes (e.g. H+ ions, inorganic phosphates).

These triathletes noticed that their breathing rates remained elevated for some time after their race.

8c. What is the name given to this phenomenon and give two reasons why their breathing rates may have remained elevated?

3 marks

Sample response

Oxygen debt or EPOC (excess post oxygen consumption). These breathing rates remain elevated for a number of reasons: returning core temperature to pre-exercise levels, absorption of H^+ ions, and restoring heart rate, ventilation and other body systems to pre-exercise levels.

Total 2 + 4 + 3 = 9 marks

Tip

- *This question involves the causes of fatigue and how the body uses oxygen to recover. Students need to understand the difference between oxygen debt, deficit and uptake.*

Question 9

9a. Identify the energy system which would be the predominant supplier of energy for the following events.

Discus:

400m sprint:

2 marks

Sample response

Discus: ATP-PC system

400m sprint: Anaerobic Glycolysis system

9b. Explain the type of recovery you would require for each of the above events.

4 marks

Sample response

For discus, you would have a passive recovery to allow for the creatine phosphate levels to replenish leading up to the next throw. You would have an active recovery to allow for faster recovery of the Lactic Acid energy system. The active recovery helps prevent venous pooling and ensures that elevated levels of oxygen are available to assist in the quicker removal of the toxic by-products of the LA system.

9c. What is the most likely cause of fatigue for a 400 metre runner?

1 mark

Sample response

Toxic by-products such as H^+ ions and inorganic phosphates inhibiting the energy-producing pathways inside the working muscles.

Below is a typical 4-week training program for a 400 metre runner during the season.

Day	Week 1	Week 2	Week 3	Week 4
Monday	6 x 300m (90% intensity)	6 x 300m (95% intensity)	Weight training: legs, upper body	8 x 300m (95% intensity)
Tuesday	Weight training: legs, upper body Swim 30 min	8 x 150m (100% intensity) Swim 30 min	8 x 150m in sand (100% intensity) Swim 30 min	Weight training: legs, upper body Swim 30 min
Wednesday	10 x 250m (95% intensity) Mental rehearsal 60 min	Weight training: legs, upper body Mental rehearsal 60 min	10 x 150m in sand (90% intensity) Mental rehearsal 60 min	10 x 250m (95% intensity) Mental rehearsal 60 min
Thursday	Weight training: legs, upper body	8 x 400m (90% intensity)	Weight training – legs, upper body	10 x 400m (95% intensity)
Friday	8 x 200m (100% intensity Swim 30 min	Weight training: legs, upper body	8 x 200m (100% intensity Swim 30 min	Weight training: legs, upper body
Saturday	Competition	Competition	Competition	Competition
Sunday	Massage 60 min	Massage 60 min	Massage 60 min	Massage 60 min

9d. What is the most common form of training shown in this program?

1 mark

Sample response

Short-to-medium interval training.

9e. Identify and provide an example for each of two training principles found in the above program.

4 marks

Sample response

Overload: there is evidence that training sessions get slightly harder further into the training weeks

Specificity: the distances run, although short for the 400m runner would have relevance for improving speed, lactate tolerance etc.

Intensity: interval training sessions provide the intensity at which the session should be conducted.

Frequency: 3 times per week for interval and weight training sessions meet the demands of fulfilling the frequency principle.

9f. What related information is not provided in the table for this training program?

1 mark

Sample response
There is no information about a work-to-rest ratio found in the program.

9g. How will this impact on the 400 metre runner's training regime?

2 marks

Sample response
If the athlete has to guess how long to wait between bouts of exercise, they might not be working at the desired work-to-rest ratio and affect the energy system being trained. This can have a negative impact on future performance.

Total 2 + 4 + 1 + 1 + 4 + 1 + 2 = 15 marks

Tip

- *The 3 energy systems and how they relate to training and the fitness components is a major part of the course. This question requires students to interpret information and have a knowledge of training programs and principles. This question has a high number of marks proportioned to it (same as the whole multi-choice section) and therefore considerable care and time should be taken to complete the question.*

Question 10
The use of hyperbaric chambers by injured athletes has increased in recent times.
10a. Why might athletes recovering from injury opt to use a hyperbaric chamber?

2 marks

Sample response
Hyperbaric chambers allow for a greater concentration of oxygen to be forced into the bloodstream. This ensures that tissues are repaired at a faster rate.

10b. What is the major benefit of using hyperbaric chambers for athletes?

1 mark

Sample response
The main advantage of using a hyperbaric chamber is that it can reduce the recovery times for injuries and get the athlete back to competing sooner.

Total 2 + 1 = 3 marks

Tip

- *This question is typical of the fact that the exam material often reflects current events in the community to make it more relevant for students. Students should pay attention to events covered in the media during the year, as they might appear in the exam.*

Question 11

11a. Explain the difference between anaerobic power and anaerobic capacity.

2 marks

Sample response

Anaerobic power is the body's ability to generate anaerobic energy quickly, while anaerobic capacity is the total amount of anaerobic energy the body can utilise.

11b. State whether anaerobic power or anaerobic capacity is more important for the following events.

100m sprint:
400m sprint:
Long jump:

3 marks

Sample response

100m sprint: anaerobic power
400m sprint: anaerobic capacity
Long jump: anaerobic power

Total 2 + 3 = 5 marks

Tip

- *This question looks at the variations contained in different fitness components. Students need to know these differences and be able to apply this knowledge to particular sporting events. It is likely that these events will be fairly generic, i.e. athletics, swimming or cycling.*

Question 12

An AFL player recorded a work-to-rest ratio of 1:1.5 during a match. He also recorded the following movement patterns.

		DIRECTION		
	Forwards	**Backwards**	**Sideways**	**Total**
Total for match	85	5	23	113

Table 1: Directional changes analysis

Field position	**Back**	**Midfield**	**Forward**
% of time	**20**	**70**	**10**

Table 2: Positional play

12a. What is the predominant energy system at work in a game of AFL football, according to the work-to-rest ratio?

1 mark

Sample response

Aerobic glycolysis

12b. The player struggles with the intensity of play in the initial two minutes of the first quarter. Why is this?

2 marks

Sample response

The player's oxygen supply is not meeting the demands of the first two minutes and they are incurring an oxygen deficit.

12c. What are the potential advantages of knowing the movement patterns of a particular player (Tables 1 and 2)?

2 marks

Sample response

Knowing the movement patterns of a particular player is advantageous in planning for certain plays during a game, or making sure the player is in the correct position. The player may not be working hard enough and can have this corrected by the coach, or certain movements required for the game may be lacking and need to be worked on at training.

12d. Complete the following table by indicating the most appropriate test to judge different aspects of the player's fitness.

Fitness component	**Energy system predominantly used**
Aerobic capacity	
Player sprinting for the ball from a stationary position	
Tackling an opponent who has the ball	

3 marks

Sample response

Fitness component	**Energy system predominantly used**
Aerobic capacity	*Aerobic glycolysis system*
Sprinting for the ball from a stationary position	*ATP-PC system*
Tackling an opponent who has the ball	*ATP-PC system*

12e. What are two reasons why it is important to use an appropriate test battery when assessing an AFL footballer's fitness in regards to training principles and protocols?

2 marks

Sample response

Specificity and validity

Total 1 + 2 + 2 + 3 + 2 = 10 marks

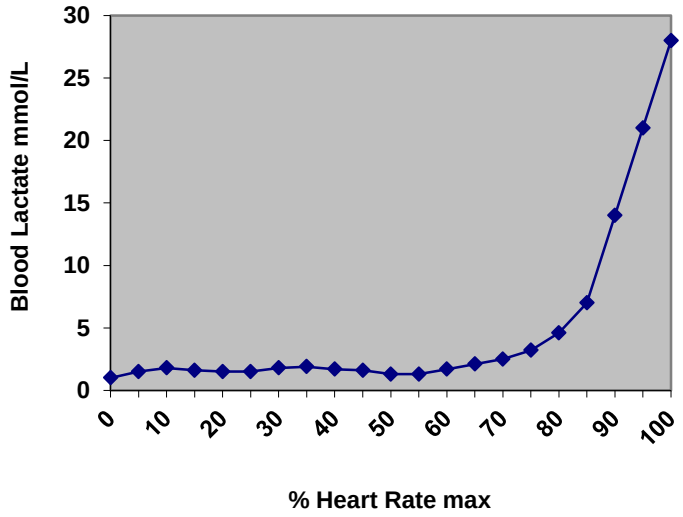
Tip

- *This question incorporates a lot of different aspects of the course. Students should study how concepts link to other areas of the course to further their understanding.*

Question 13

An endurance athlete who is on a training run starts to sprint up a hill. After a few seconds he reaches his lactate inflection point.

13a. On the graph below, mark on the graph below the approximate lactate inflection point (LIP) for this particular athlete.



1 mark

Sample response

Mark the graph at approximately 80–85%, where it starts to rise more significantly.

13b. What sort of training should the athlete do to extend the time it takes for him to reach the LIP at the same intensity? Why is this the case?

2 marks

Sample response

He should be doing continuous or long interval training, as a greater supply of oxygen will help clear the lactate at a faster rate.

13c. What are three acute responses to running up the hill the athlete will experience, according to the following headings?

Respiratory:

Cardiovascular:

Muscular:

3 marks

Sample response

Respiratory: increase in ventilation, respiratory rate and pulmonary diffusion.
Cardiovascular: increase in heart rate, stroke volume, cardiac output, blood pressure, venous return and oxygen consumption.
Muscular: increase in motor unit recruitment, blood flow to working muscles, body temperature, lactate production, decreased glycogen stores.

13d. State the chronic adaptations this athlete would see for the following after a significant period of training:
Resting heart rate:
Mitochondria:
Stroke volume:

3 marks

Sample response
Resting heart rate: decrease
Mitochondria: increase in density, numbers, or size
Stroke volume: increase.

Total 1 + 2 + 3 + 3 = 9 marks

Tip

- *An understanding of the LIP is essential as it has been a contentious topic in previous exams. Learning how the body adapts to exercise and training is a key way to separate the varying levels of students and therefore will be found in all final exams.*

Question 14
The coach of a local soccer team was notorious for "revving up" his players before games. At his club, he noticed his speeches would get the players a bit "fired up" and they would commit a lot of fouls early in games.

14a. Give a possible reason why it took the players in his team so long to settle down when starting their games.

2 marks

Sample response
The players are generally over-aroused and prone to making mistakes early in the game.

14b. Other than toning down his speeches, what could the coach do to get his players to settle quicker into the games they played?

2 marks

Sample response
The coach could employ some arousal reduction techniques with his players such as having them listen to arousal-reducing music.

14c. Briefly explain why all the players would not be equally affected by the coach's ranting before they played a game.

1 mark

Sample response
Athletes all have differing optimal arousal levels and will be affected differently by the coach's speeches. Each player has a different optimal level of arousal and a "rev up" will not achieve this with the majority of players.

Total 2 + 2 + 1 = 5 marks

Tip

- *This question relates to the concept of arousal. Arousal is a topic that relates to performance and students need to know ways to increase and decrease arousal levels.*

END OF SOLUTIONS BOOK