



General Certificate of Education

Physical Education 2580

PHED3

**Optimising Performance and Evaluating
Contemporary Issues within Sport**

Specimen Assessment Material

Mark Scheme

Specimen mark scheme for examinations in June 2010 onwards
This mark scheme uses the new numbering system

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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Section A

Question 1

In order to optimise performance, athletes may take supplements.

- 01** Discuss the potential benefits and harmful effects to an athlete in taking caffeine, creatine and sodium bicarbonate supplements. *(14 marks)*

A good answer must address all parts of the question adequately, and should consider accurately the following topic areas:

- The potential benefits and harmful effects of caffeine, addressing points such as:
 - Primarily used by endurance athletes/games players

Benefits

 - Stimulant
 - Increased mental alertness
 - Reduces effects of fatigue
 - Allows performer to continue at higher intensity for a longer duration
 - Reacts quicker to aspects on the track/pitch
 - Overall leading to a higher level of performance

Drawbacks

 - Loss of fine control
 - Against rules of most sports in large quantities

- The potential benefits and harmful effects of creatine, addressing points such as:
 - Sprinters/intense exercise/sprinting/weight lifting

Benefits

 - Increases phosphocreatine stores
 - Increases the amount of energy supplied from this system
 - Able to perform maximally for longer, leading to increase in performance

Drawbacks

 - Water retention
 - Vomiting, diarrhoea

- The potential benefits and harmful effects of sodium bicarbonate, addressing points such as:
 - Sprinters/endurance athletes

Benefits

 - Increases buffering of lactate
 - Delays in the onset of blood lactate accumulation
 - Enables performer to maintain intensity for a longer duration

Drawbacks

 - May cause vomiting

The following table should be used to determine the mark.

Band Range	Band descriptors
Level 4 11-14 mks	<ul style="list-style-type: none"> • Addresses all areas of the question, demonstrates a wide range of depth and knowledge • Expresses arguments clearly and concisely • Few errors in spelling, punctuation and grammar, correct use of technical language
Level 3 7-10 mks	<ul style="list-style-type: none"> • Addresses most areas of the question, demonstrates a clear level of depth and knowledge • Attempts to express arguments clearly and concisely • Few errors in spelling, punctuation and grammar, correct use of technical language although sometimes inaccurately
Level 2 4-6 mks	<ul style="list-style-type: none"> • Addresses some aspects of the question but lacks sufficient depth and knowledge • Limited attempt to develop any arguments or discussions, normally vague or irrelevant • Errors in spelling, punctuation and grammar, limited use of technical language
Level 1 1-3 mks	<ul style="list-style-type: none"> • Addresses the question with limited success • Major errors in spelling, punctuation and grammar, little use of technical language
Level 0 0 mks	<ul style="list-style-type: none"> • Addresses no aspect of the question

Question 2

Elite athletes may train in different climates in order to acclimatise prior to a competition.

02 How does the body regulate temperature when an elite performer is exercising in a warm climate? *3 marks*

1. Transfer heat away from core
2. Vasodilation of blood vessels to the skin
3. Sweating/evaporation
4. Reddening to skin to radiate heat away
5. Conduction and convection
6. Maintains blood plasma

03 What are the effects of dehydration on an athlete and how does this affect performance? *(4 marks)*

1. Increase blood viscosity
2. Reduced blood pressure
3. Reduced cardiac output
4. Reduced sweating to prevent water loss
5. Increased core temperature
6. Enzymes become denatured and do not perform to optimum
7. Unable to meet demands of exercise
8. Decreased performance

Question 3

Ice skaters will normally perform a four to five minute routine for their long programme section in a major championship

04 During a four minute skating programme, what will be the **main** 'energy source's' used? (3 marks)

1. Fats/fatty acids/glycerol
2. Triglycerides
3. Lactate/protein/amino acids/lactic acid/creatine
4. Glycogen
5. Glucose/sugar
6. Carbohydrate

05 Explain how the regeneration of ATP is achieved during their programme. (4 marks)

1. Carbohydrates/glycogen/glucose broken down into pyruvate
2. Anaerobic/glycolysis
3. Some ATP produced
4. Fats/triglycerides/fatty acids/glycerol broken down into variety of compounds
5. Beta oxidation
6. Into mitochondria
7. Krebs cycle
8. Electron transport chain
9. Oxidation/aerobic
10. Large quantities

Question 4

The winner of a weightlifting competition is determined by the performer who is unable to lift the heaviest weight.

06 Explain how a muscle contracts according to the 'sliding filament theory'. (4 marks)

1. Action potential reaches the motor end plate and causes depolarisation
2. This causes calcium ions to be released
3. The calcium ions attach to troponin
4. This moves/changes the tropomyosin complex
5. This leaves the binding sites on the actin free
6. Myosin heads attach to the actin binding site to form cross bridges
7. ATP required to form cross bridge
8. Myosin head moves towards the centre/power stroke occurs
9. Actin slides over the myosin/actin moves towards the centre of the sarcomere
10. Cross bridge then broken but can be recreated if calcium ions are still present
11. ATP is also required to allow the myosin to break the cross bridge

07 The strength of a muscle contraction involves the use of motor units. How are motor units used to produce muscle contractions of varying strength in a lift? (3 marks)

1. Number of motor units used could be varied
2. All or nothing law
3. Size of motor units could be varied
4. Spatial summation
5. Fast-twitch motor units produce more force/slow-twitch less force

3 marks

Section B

Question 5

In the build up to a major competition performers may get anxious.

- 08** What are the possible effects on performance when a performer enters a major competition with a high level of anxiety? Discuss the strategies and techniques the performer may use to manage anxiety in the build up to the competition. (14 marks)

A good answer must address all parts of the question adequately, and should consider accurately the following topic areas:

- Possible effects of anxiety on performance, addressing points such as:
 - Cognitive anxiety, psychological side, e.g. nerves, worry, apprehension
 - Has a negative linear relationship with performance
 - Increased levels of cognitive anxiety = decrease in overall performance
 - Somatic anxiety in the physiological aspect e.g. sweaty palm, high HR
 - Has an inverted U theory relationship, optimal level for best performance

- Strategies and techniques to manage anxiety, addressing points such as:
 - Progressive muscle relaxation
 - Breathing techniques
 - Thought stopping
 - Visualisation/imagery
 - Mental rehearsal
 - Centering
 - Attention focussing/Cue utilisation
 - Use of goal-setting
 - Using SMART/SMARTER principles
 - Positive self-talk
 - Hypnosis

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Question 6

After a competition, games players may explain their success or failure using a variety of factors called attributions. Some attributions may be damaging to the player's future performances through the development of learned helplessness.

09 What are the **four** main groups of 'attributions'? (2 marks)

1. Luck
2. Effort
3. Task difficulty
4. Ability

10 What do you understand by the term 'learned helplessness' **and** what strategies may a coach use to prevent this happening? (5 marks)

1. Learned helplessness – idea that failure is inevitable/examples
2. Can be applied globally or to specific situations
3. Normally caused by player attributing wrong factor to failure e.g. an internal and stable reason rather than external and unstable
4. Possibly leading to the idea of giving up even when success is possible/examples

Strategies to overcome

5. Coach to enable player to achieve success/play weaker opposition/examples
6. Encourage view that success due to stable /internal factors – ability/examples
7. That failure due to unstable/external factors – effort or luck/examples
8. Attribution retraining

Question 7

In order to achieve optimal performance, sports performers need to control certain psychological factors such as aggression.

- 11** Discuss the 'social learning theory' of aggression. *(4 marks)*
1. Aggressive behaviours are learned
 2. Non-aggressive behaviours can also be learned
 3. Through observation/copying/modelling
 4. Observation of realistic events more likely to affect learning
 5. Observation of more 'high status'/roles models/performers significant others
 6. Imitation more likely if learner thinks behaviour will be reinforced
 7. Or thinks it will not be punished; e.g. – approved by team mates/coach/audience/behaviour goes unpunished
- 12** What can a referee do to control aggression during a major sporting competition? *(3 marks)*
1. Talking to/pre-warning players
 2. Apply rules properly/correctly/fairly
 3. Punish aggressive behaviour/examples
 4. Immediate sanctions
 5. Be consistent in judgements/sanctions

Question 8

Sometimes elite performers fail to replicate the level of performance demonstrated in training when competing in a major event.

- 13** Apart from drive theory, name **two** other theories of arousal. *(3 marks)*
1. Inverted 'U' theory
 2. Catastrophe theory
 3. Baron's distraction-conflict theory
- 14** Discuss the effect that the presence of an audience may have upon the level of performance for a novice performer **and** an elite performer. *(4 marks)*
1. Presence of an audience increased arousal/anxiety
 2. Can lead to either social facilitation
 3. Or social inhibition
 4. Increase in arousal will cause the dominant response
 5. Novice – not well-learned – poorer performance
 6. Elite – well-learned – improved performance
 7. Complex skill more difficult to perform/simple skill easier to perform
 8. Will also have an impact if they feel the crowd is evaluating them/evaluation apprehension
 9. The importance of the crowd will also dictate the level of arousal

Section C

Question 9

'Advancements in technology have improved sport beyond all recognition.'

- 15** Evaluate the impact of technology on the performer, coach and spectator in the modern day sporting arena and discuss whether these advancements have improved sport. *(14 marks)*

A good answer must address all parts of the question adequately, and should consider accurately the following topic areas:

- Impact of technology on the performer, addressing points such as:
 - Increased knowledge of diet e.g. carbo-loading
 - Supplementation e.g. Creatine, Lucozade Sport
 - Faster rehabilitation
 - Due to O² tents, hypobaric chambers, ice baths
 - Improved testing to provide continuous feedback on effectiveness of training programmes
 - Advancements in stress management techniques to control arousal
 - Tailor made equipment – ensure everything is designed to performers preferences
 - Facilities that recreate climates/environments, no need to travel/time out of country
 - Instant feedback on performance through HR monitors/smart shirts
 - Advancements in clothing enable performer to continue at higher intensity
- Impact of technology on the coach, addressing points such as:
 - Video analysis of matches enables to highlight tactical/strategic issues
 - Technique analysis can be done instantaneously with use of software such as Dartfish
 - More detailed information to provide a more focussed training programme
 - New training techniques to improve performance eg SAQ
- Impact of technology on the spectator, addressing points such as:
 - Improved home experience through increased number of camera's
 - Wider range of sports more accessible through advancements in media
 - Development of technology such as Hawkeye have increased the interactive feel

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Question 10

Violence can sometimes occur in elite sport, for example football, both on and off the pitch.

16 Why might an elite performer commit an act of violence on the pitch? *(3 marks)*

1. Over-strong desire to win/over arousal/pressure
2. May be encouraged/asked to do so by coach/team mates/pressure from sponsors/crowds
3. Player loses control due to action of opponents/referee decisions/retaliates/frustration
4. Player lacks moral/ethical restraints on personal behaviour
5. Financial rewards
6. Importance of game/cup final/equivalent

17 Explain, using examples, why an elite performer may need the protection of the law during their sporting careers. *(4 marks)*

1. Opposition player fouls/protection from violence
2. Off field of play – contracts with employers/administration of wages/assets/Bosman ruling
3. Sponsorship deals/commercial deals
4. Protection from media intrusion into private life
5. Protection from hooligans during and after games
6. Maintenance of restricted areas during training/competitions
7. Protection from racism/equal opportunities

Question 11

'Sport performers should be allowed to use performance enhancing drugs like any other training aid.'

18 Discuss this statement. (7 marks)

Yes: *sub max 4 marks*

1. Battle against drugs is expensive/time consuming
2. Detection not effective/always behind chemists
3. Difficult to define drug as compared to aid/supplement
4. Sacrifices performer makes to achieve success is personal
5. High performance leads to more spectators/sponsors/money
6. Level playing field for all

No: *sub max 4 marks*

7. Side effects are dangerous/health risks
8. Young tempted to use them/role model effect
9. Coaches/peer pressure may force performers to use drugs
10. Sport is about using natural talent
11. Drug use is outside this concept
12. Cheating/unethical
13. Costly
14. Only the richer countries will be able to afford the technology, therefore uneven playing field

Question 12

World Championships are organised by the International Federation of that sport.

19 Discuss how external factors (such as the media) may influence the organisational structure or management of these events. (7 marks)

1. Media/Sponsors – may affect timing of events within the championships
2. Sponsors may influence the IGB to extend the number of teams/matches/rounds
3. Rule changes/sudden death/penalty shoot outs or other examples
4. Host countries/cities may influence venues/ticket sales/length or size of tournament
5. Local/National governments may place condition on facility/construction/post championships use in return for financial support/funding for facilities
6. National governments of competing team/individuals may engage in protest/boycott
7. Security issues/politics/terrorists
8. Local infrastructure/transport/communications network/local business interests – relocation