



## General Certificate of Education

# Sport and Physical Education 6581

*(PED4)*

## Mark Scheme

*2006 examination – June Series*

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.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

# Sport & Physical Education

## Unit 4

### General Instructions

In the mark scheme ; separates single marks  
/ indicates alternatives  
CAO correct answer only  
Equiv. Means allow any equivalent answers.

- 1 (a)
1. Fats;
  2. Fatty acids;
  3. Glycerol;
  4. Triglycerides. *Sub max 2 marks*
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5. Carbohydrates;
  6. Glycogen;
  7. Glucose;
  8. Protein/lactate. *Sub max 2 marks*  
*3 marks*
- (b)
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 of ATP produced. *5 marks*
- (c)
1. Traits – innate/inherited/stable/enduring factors;
  2. Same personality in all situations/pre-disposition to behave in the same way; *Sub max 2 marks*
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3. Interactionist – concerned with traits;
  4. And interaction with the situation;
  5.  $B = f(P.E.)$ . *Sub max 2 marks*  
*3 marks*
- (d)
1. Seek out challenging situations;
  2. Concerned with high standards of performance;
  3. Task persistence;
  4. Approach behaviours;
  5. Enjoy evaluative situations;

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6. Not afraid of failure;  
 7. Value feedback from others/coach;  
 8. Attribute performance to internal factors/effort/ability. 4 marks
2. (a) (i) 1. Thoughts/cognitive;  
 2. Emotional response/feelings/affective;  
 3. Attitudes are not global but specific to the performer;  
 4. Producing behaviour;  
 5. To a specific object/situation;  
 6. Learned;  
 7. Significant others/parents/peers/role models. 4 marks
- (ii) 1. Behaviour does not always follow thinking/feelings;  
 2. Other factors/conflicts/available time/social interactions affect behaviour;  
 3. Specific attitudes predict specific behaviours;  
 4. Best predictor of behaviour is behavioural intention;  
 5. Especially if situational factors are also favourable. 3 marks
- (b) **Advantages**  
 1. Store more glycogen than normal/equiv;  
 2. Aerobic energy source;  
 3. Lack of glycogen to last race/delays hitting the wall/delaying fatigue;  
 4. Manipulate diet;  
 5. Reduce intake then over compensate; *sub max 3 per section*
- Disadvantages**  
 6. Affects metabolism/digestion; (do not credit indigestion/stomach problem)  
 7. Water retention/heavy legs;  
 8. Alterations to training programme/tapering/reduce training intensity *sub max 3 per section*  
4 marks
- (c) **Problems**  
 1. Exercise/muscle contraction generates heat;  
 2. High core temperature;  
 3. Increased blood viscosity/blood gets thicker;  
 4. Metabolic processes slowed down;  
 5. Cannot transfer metabolic heat generated by muscles quickly enough/unable to sweat efficiently  
 6. Denaturation of enzymes/enzymes don't function/work properly;  
 7. Loss of electrolytes/dehydration;
- Regulation**  
 8. Thermoregulatory centre/medulla/hypothalamus;  
 9. Heat loss through sweating/evaporation;  
 10. Vasodilation/opening of skin capillaries/blood closer to skin;  
 11. Heat loss through radiation;  
 12. Heat loss through conduction/convection;  
 13. Rehydration;  
 14. Training adaptations. 4 marks
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3. (a) (i) 1. Maximum oxygen uptake/consumption/used;  
 2. Per minute/unit of time. 2 marks
- (ii) 1. Increased myoglobin content;  
 2. More/bigger mitochondria;  
 3. More oxidative enzymes;  
 4. Increase in stored glycogen;  
 5. Improved oxidation of fat;  
 6. Cardiac hypertrophy/athletes heart/ (*do not credit bigger/stronger*);  
 7. Increased stroke volume/more blood per beat;  
 8. Increased maximum cardiac output;  
 9. Increased blood volume/haemoglobin content/red blood cells/EPO;  
 10. Increased capillary density/capillarisation;  
 11. Increased hypertrophy of slow-twitch muscle fibres;  
 12. Increased a-VO<sub>2</sub> differences;  
 13. Increase in a maximal minute ventilation;  
 14. Increased pulmonary diffusion capacity;  
 15. Increased lactate accumulation/delayed OBLA;  
 16. Reduced EPOC;  
 17. Reduced percentage of body fat  
 (*credit reverse in relation to untrained*) 5 marks
- (b) 1. Task-orientated/autocratic; (*not command style*)  
 2. Relationship/person-orientated/democratic;  
 3. Task-orientated/autocratic best in very favourable or very unfavourable situations;  
 4. Example related to point 3/winning/doing well/being successful/supportive parents/good facilities/discipline structure/strong leadership position;  
 5. Relation-orientated best in moderately favourable situations;  
 6. Example related to point 5/opposite of examples given in 4. 4 marks
- (c) 1. Younger teams – relation-orientated preferred/democratic/person orientated;  
 2. Older teams – autocratic/task-orientated/authoritarian/command;  
 3. Female teams – democratic style/person orientated;  
 4. Males – autocratic style/command style;  
 5. Highly skilled prefer relationship-orientated;  
 6. Weaker players prefer task-orientated;  
 7. Larger – autocratic/command style;  
 8. Smaller – democratic;  
4 marks
4. (a) (i) 1. Drive theory;  
 2. Catastrophe theory;  
 3. Barons distraction conflict theory. 2 marks
- (ii) 1. **A** = golf/putting, **B** = passing/hockey, **C** = tackling/rugby.

*2 marks for all 3 correct  
1 mark for 1 correct*

- arousal
2. Putting is a Fine/complex skill – requires a lower optimum level of arousal
  3. Hockey is a mixture of fine/gross therefore moderate optimum level of arousal
  4. Tackling in rugby is a gross skill less complex requires high optimum levels of arousal
  5. Too much/too little arousal interferes with co-ordination, cognition/decision making and/or performance *4 marks*
- (iii)
1. Low optimum levels of arousal for novice performers/high optimum levels for elite performers;
  2. Decision making requires low levels of arousal, as needed for new skills;
  3. High arousal levels = Dominant learned response occurs
  4. Novice performer = dominant response usually wrong/Elite performer = dominant response correct *2 marks*
- (b)
1. (First Law) force required to change state of motion (of performance);
  2. (Second Law) size of force governs change of momentum; (*do not credit  $F=MA$* )
  3. Mass remains constant;
  4. Force governs the magnitude of the acceleration given to the ball;
  5. And direction;
  6. (Third Law) equal and opposite (ground) reaction force;
  7. Performer applies force to ball through muscle contractions. *4 marks*
- (c)
1. Parabolic flightpath/trajectory/parabola;
  2. Gravity reduces height achieved/brings projectile back to earth;
  3. Acts on the vertical component;
  4. Air resistance has no negligible effects;
  5. Horizontal components of most sports projectiles;
  6. Some projectiles affected by air resistance/shape – golf ball dimples *3 marks*  
(*Do not credit wind*)
5. (a)
1. Task persistence;
  2. Focuses learning/target to aim for/directs attention to certain skill;
  3. Motivates performer/mobilises effort through feedback;
  4. Reduces stress/anxiety;
  5. Increases self-efficacy/confidence. *3 marks*
- (b)
1. SMARTER/SCAMP; (*Mnemonic must be in correct order to credit*)
  2. Specific when not generalised – so that the athlete knows what they are working towards and when they have reached the goal/specific to themselves;
  3. Controllable – within the athlete’s control and not influenced by the performance of others;
  4. Challenging/exciting to provide an incentive and the satisfaction of achievement;

5. Attainable/realistic – within the athlete’s capabilities so that the performer does not become disheartened by being unable to reach the goal;
6. Measurable and recordable – use times/distances;
7. Personal/agreed – set jointly between athlete and coach;
8. Written down and available to performer;
9. Short and long-term/timed/feedback on progress can be provided and adjustments made;
10. Set goals for both practice and competition;
11. Performance/individual goals used;
12. Outcomes/team goals not as effective. *5 marks*

(c) *Sub max 1 mark*

1. LT – lactate/lactic acid levels increase in blood/OBLA;

*Sub max 3 marks*

2. Lactic anaerobic pathway/alactic system/anaerobic;
3. Carbohydrates/glycogen/glucose broken down to pyruvate;
4. Glycolysis;
5. ATP produced;
6. Conversion/produces lactate/lactic acid
7. LDH – lactate dehydrogenase  
*(accept annotated diagrams & equations) (only credit point 6 only if linked to 3&4)* *4 marks*

- (d)
1. Insufficient/not enough time for recovery;
  2. Lactate removed during recovery time;
  3. EPOC;
  4. Uses aerobic system;
  5. Lactate builds up/increased H<sup>+</sup>/decreased pH;
  6. Which causes muscle fatigue;
  7. Acidity inhibits muscle contraction/enzyme activity;
  8. ATP produced too slowly.

*3 marks*

### **Quality of Written Communication**

The GCSE and GCE A/AS Code of Practice requires the assessment of candidates' Quality of written communication wherever they are required to write in continuous Prose. In this unit, this assessment will take place for the candidates' script as a whole by means of the following marking criteria.

The candidate expresses moderately complex ideas clearly and reasonably fluently, through well linked sentences and paragraphs. Arguments are generally relevant and well structured. There may be occasional errors of grammar, punctuation and spelling.

*4 - 3 marks*

The candidate expresses straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well connected. Arguments may sometimes stray from the point or be weakly presented. There may be some errors of grammar, punctuation and spelling, but not such as to suggest a weakness in these areas. *2 - 1 marks*

Ideas are expressed poorly and sentences and paragraphs are not connected. There are errors of grammar, punctuation and spelling, showing a weakness in these areas. *0 marks*

**Total** *4 marks*