



## **General Certificate of Education**

# **Sport and Physical Education 6581**

**PED4**

## **Mark Scheme**

*2007 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.

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# 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) (i) 4 marks for 4 of:
- A. First Law – reluctance to change state of motion/constant motion/ uniform motion/velocity;
  - B. Force required to change state of motion/overcome inertia of player;
  - C. Muscle contractions; (Sub max 2 marks)
  - D. Second Law – magnitude/size of force governs change in momentum;
  - E. Mass remains constant;
  - F. Force governs magnitude of acceleration given to player;
  - G. And direction; (Sub max 2 marks)
  - H. Third Law – equal and opposite reaction force;
  - I. Force applied to ground/ moves performer;
  - J. Ground Reaction Force. (Sub max 2 marks)
- Max of 5 marks*

*Do not credit Force = Mass x Acceleration*

*Only credit responses that relate to the player not the ball.*

- (b)
- A. Velocity = rate of change of displacement/displacement ÷ time;  
(Not speed, not distance)
  - B. How fast/quickly player moves towards ball;
  - C. Acceleration (not speed) = rate of change of velocity/change in velocity ÷ time (taken to change)/[Vf - Vi] ÷ time/a =  $\Delta v \div t$ ;
  - D. Push off ground to accelerate (not speed)/change velocity;
  - E. (Both) have direction/are vectors. *3 marks*

*Only credit responses that relate to the player not the ball.*

- (c) (i)
- A. Theory from Zajonc;
  - B. Presence of audience causes increased arousal;
  - C. Social facilitation;
  - D. Drive theory;
  - E. (Presence of others) enhances/increases emission/ likelihood/probability of dominant response/habit;
  - F. Beginner/novice/cognitive stage – negative effects;
  - G. Negative effect is social inhibition;
  - H. Expert/elite/associative/autonomous stages – performance enhanced by presence of audience;
  - I. Evaluation apprehension/equiv;
  - J. Use of arousal control techniques. *Max of 5 marks*

- (ii) A. Use of relaxation techniques/egs/mental rehearsal/imagery/self talk/block out audience/selective attention/blocking techniques;  
 B. Learn in presence of others/similar situation/introduce audience;  
 C. Increase the size of the audience early;  
 D. Guarantee success/weaker opposition/achievable goals;  
 E. Gradually introduce evaluation; *Max of 2 marks*
2. (a) A. Effective leaders should change style of leadership;  
 B. Leader has preferred style;  
 C. Situational preference/situation demands a certain style;  
 D. Team members demand a certain style;  
 E. Performer's satisfaction/performance best when all preferences match/congruent;  
 F. Task-oriented/autocratic leader – focuses on team performance;  
 G. Relationship-oriented/democratic leaders develop/person orientated/concerned with inter-personal relationships;  
 H. Some members have traditional preferences/loath to change/suitable examples. *4 marks*
- (b) (i) A. Goals blocked/suitable eg/opposition/defending/referees;  
 B. Increases aggression/anger;  
 C. Frustration leads to aggression/aggression always stems from frustration;  
 D. Aggression is immediate relief of frustration/catharsis. *2 marks*
- (ii) A. Social learning theory;  
 B. Learn to behave/learn to follow/know the rules/learn to be assertive;  
 C. Aggression only if cues/signals/triggers present  
 D. Arousal may be channelled.
- (c) (i) A. ATP/PC levels fall;  
 B. ATP/PC supplying energy;  
 C. PC breakdown for ATP resynthesis;  
 D.  $ATP \rightarrow ADP + P = \text{energy}$   
 E. ATP/PC resynthesised during rest/recovery;  
 F. Insufficient recovery time/not enough ATP/PC resynthesised. *Max of 4 marks*
- (ii) A. EPOC/Excess/Post Exercise Oxygen Consumption;  
 B. Fast component/alactic;  
 C. Using aerobic system/energy/oxygen;  
 D.  $P + C \rightarrow PC$ /word equiv;  
 E.  $ADP + P + \text{energy} \rightarrow ATP$ /word equiv; *Max of 3 marks*
3. (a) A. Elite athletes – iceberg profile;  
 B. Higher scores on vigour;  
 C. Lower scores on other emotional states/a suitable eg, such as anger, confusion, depression, tension, fatigue (*only need 1*);  
 D. Fun runners – flatline of population norm/average person/normal person. *ax 3 marks*

- (b) (i) A. Cognitive state anxiety – psychological/feelings of nervousness/ apprehension/ and worry (not mental/mind thoughts);  
 B. Somatic state anxiety – physiological/awareness of arousal – sweaty palms/ high heart rate/butterflies/nausea/muscle tension etc  
*(Do not credit not physical)* 2 marks
- (ii) A. Cognitive state anxiety increases slowly/gradually in the days prior to competition;  
 B. Changes during competition/fluctuates, as the likelihood of success or failure changes;  
 C. Somatic style anxiety tends to be low well before competition, but increases rapidly as event approaches;  
 D. Generally decreases during competition.  
*Accept annotated diagrams* 3 marks
- (c) (i) A. Maximum oxygen used/vol/amount/uptake/consumed/taken up;  
 B. Per minute/unit time;  
*Do not credit over a long period of time* 2 marks
- (ii) List **five structural and/or physiological** reasons why the  $VO_2$  max of an elite athlete may be greater than that of a fun runner.
- A. Increased maximum cardiac output;  
 B. Increased stroke volume/ejection fraction /cardiac hypertrophy;  
 (not bigger heart/muscle)  
 C. Greater heart rate range/RHR → MHR;  
 D. Less oxygen being used for heart muscle/more available to muscles;  
 E. Increased a- $vO_2$  diff;  
 F. Increased blood volume and haemoglobin/red blood cells/blood count;  
 G. Increased stores of glycogen and triglycerides;  
 H. Increased myoglobin (content of muscle);  
 I. Increased capillarisation (of muscle);  
 J. Increased (number and size) of mitochondria;  
 K. Increased concentrations of oxidative enzymes;  
 L. Increased lactate tolerance/clearance/Increased % $VO_2$  max/OBLA/anaerobic threshold;  
 M. Reduced body fat  
 N. Slow twitch hypertrophy Max of 5 marks
4. (a) A. Gravity and friction/air resistance;  
 B. Ball's motion has vertical and horizontal components;  
 C. Gravity decreases vertical component/acts downwards/affects height;  
 D. From positive to negative;  
 E. Friction/air resistance affects horizontal component/distance/speed/slows;  
 F. Negligible/doesn't change/stays the same. Max of 4 marks
- (b) A. Changes to contraction/lengthening/shortening/stretch in muscle detected by spindles/intrafusal fibres;  
 B. Sensory nerve impulses to brain/spinal cord/CNS;

- C. Body awareness/kinesthesia/position of arms set;  
 D. Spindles pre-set tension in muscles/muscle loading;  
 E. Uses memory/experience; (*E must be linked to D to credit*)  
 F. Gamma bias (*do not credit gamma neuron*). *3 marks*
- (c) A. (Forces) keeping a group together/resistance to breaking up/team works together;  
 B. Task cohesion – working to common goals/targets/tasks;  
 C. Social cohesion – interpersonal attraction/liking each other/socialising together. *3 marks*
- (d) A. Individuals put in less than 100% effort/lack of motivation/can't be bothered; *sub max 1 mark*  
 B. Individual's output not measured effectively/able to hide/shirk responsibility;  
 C. Task/goal lacks meaning for the individual/;  
 D. Individuals' personal involvement is low/role conflict/not understanding the role/lack of assigned role/disagree with role;  
 E. Individual's efforts cannot be compared to group standards/lack of fitness;  
 F. Some of the group are not known to other individuals/sub groups/cliques/limited cohesion;  
 G. Individual expects other co-workers to do well/relying on others;  
 H. Individual believes his efforts will go unnoticed/undervalued/unappreciated;  
 I. Easier to loaf with more people *sub max 4 marks*
- 5** (a) (i) A. Anaerobic/without O<sub>2</sub>;  
 B. Glycolysis/lactic acid/lactacid;  
 C. ATP produced;  
 D. Glucose/glycogen/carbohydrate to pyruvate/pyruvic acid;  
 E. Pyruvate to lactate/lactic acid *Max of 4 marks*
- (ii) A. Lactate/lactic acid;  
 B. Increased acidity/decreased pH;  
 C. Inhibition of enzyme action/contractile process/inhibits muscle action/contraction; *Max of 2 marks*
- (iii) A. EPOC/Excess Post Exercise Oxygen Consumption  
 B. Slow component/lactacid;  
 C. Oxygen used/needed for aerobic energy;  
 D. Lactate mainly converted back into pyruvate/CO<sub>2</sub> and water;  
 E. In inactive muscles/ other organs (liver);  
 F. Some lactate converted to glucose/glycogen/protein;  
 G. Cori cycle;  
 H. Excreted in urine and sweat *Max of 4 marks*
- (b) A. Use of appropriate mnemonic – SMARTER, SCAMP, SMART; *(Sub max 1 mark)*  
 B. (Specific) not generalised – to the athlete/the event so that the athlete knows what they are working towards and when they have reached the goal;  
 C. (Controllable) – within the athlete's control and not influenced by the performance of others;  
 D. (Challenging/Exciting) – to provide an incentive and the satisfaction of achievements/to motivate;

- E. (Attainable/Realistic) – within the athlete’s capabilities so that the performer does not become disheartened by being unable to reach the goal;
- F. (Measurable) – use times/distances/objective measures;
- G. (Personal/Agreed) – set jointly between athlete and coach;
- H. (Written down and recordable) and available to performer/formalised;
- I. (Short and long-term/Times) so that feedback on progress can be provided and adjustments made/evaluation;
- J. Set goals for both practice and competition;
- K. Performance/individual goals used;
- L. Outcome/team goals more effective.

*Max of 5 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 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. *3 – 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*