

GCE 2004  
*June Series*



# Mark Scheme

## Sport & Physical Education *Unit PED4*

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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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# 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. Questionnaire (Likert scale/Thurston scale/Osgoods semantic differential);
  2. Interview;
  3. Observation/physiological tests; *2 marks*
- (Only credit first two answers, although accept examples)*
- (b)
1. Cognitive, affective and behavioural; *Sub max 1 mark*
  2. (Cognitive) – a person’s beliefs/ideas/knowledge concerning some person/thing/event;
  3. (Affective) – a person’s emotional response to/liking of/evaluation of some person/thing/event/attitude object;
  4. (Behavioural) – a person’s behavioural response/action/do/performance/behaves to some person/thing/event/attitude object. *4 marks*
- (c)
1. Cognitive dissonance or clear alternative/psychological discomfort/create an imbalance;
  2. Cognitive – through education/influencing/explaining/learning;
  3. Persuasive communication from a significant agent – teacher/friend/coach/parent/role model/media/peers/etc;
  4. Affective - creation of a positive (vicarious) experience/enjoyment through experience;
  5. Behavioural – through reinforcement by significant other/coach/parent/role model;
  6. Through exemplar behaviour of significant other.
- (Must link back to the component to credit)* *3 marks*

- (d)
1. Newton's First law – a body remains in a state of motion until acted upon by a force;
  2. Sprinter remains stationary until a force causes them to change their state of motion/overcome their inertia;
  3. Newton's Second Law- body accelerates/changes momentum with a magnitude that depends on magnitude of force causing change (*N.B. not  $F=ma$* );
  4. Also force gives direction;
  5. Sprinter applies force to ground/blocks; (*Do not credit push/drive*)
  6. Magnitude of (muscular) force determines acceleration given to sprinter;
  7. Newton's Third Law – to every force there is an equal and opposite reaction force;
  8. Action/applied force are muscular contractions given to earth/blocks;
  9. Equal and opposite reaction force moves the lighter mass of the sprinter.

*6 marks*

2

- (a) Spatial summation –
1. Increase in number of nerve impulses to activate muscle fibre;
  2. Reaching a threshold/all or nothing law/contract or not to contract;
  3. Use of different numbers of motor units
  4. And sizes of motor units
  5. Allow repeat contraction/good for muscular endurance/spreads fatigue;

*Sub max 3 marks*

Wave summation –

6. Second or subsequent nerve impulse received;
7. Before muscle fibre has time to relax/recover;
8. Leads to a stronger contraction;
9. Tetanic/fused/steady contraction.

*Sub max 3 marks*

*(Credit correct annotated diagrams)*

*5 marks*

- (b)
1. Muscle spindles detect muscle tension/force/strength;
  2. Sensory impulse to brain;
  3. Control by alpha neurones;
  4. Control gamma neurones;
  5. Muscle spindles/intrafusal fibres contract;
  6. More fibres and hence more force;
  7. Used in stretch reflex/pylometrics/stretch contraction/eccentric – concentric;
  8. Pre-setting of gamma bias;
  9. Involves use of memory.

*3 marks*

- (c)
1. Drive theory — as arousal increases performance improves/linear relationship;
  2. Increases likelihood of dominant response occurring;
  3. If task is simple or well-learned dominant response is more likely to be correct/elite/experienced;
  4. In complex/unlearned skills increasing arousal damages performance as dominant response is incorrect/novice;
  5. Difficult to define well-learned task;
  6. Even well-learned skills deteriorate if performer over-aroused;
  7. Inverted U – increase in arousal causes increase in performance up to optimal point;
  8. Beyond that point performance deteriorates. *Sub max 5 marks*
9. Different levels of arousal for gross and fine skills;
10. Lower optimal arousal for complex/higher arousal for less complex/fitness-related skills/accept e.g. and diagrams;
11. Lower optimal arousal for open skills because of cognitive nature; *Sub max 3 marks*
- 7 marks*

**3**

- (a)
1. There are different types of audience;
  2. Some audiences are isolated/passive such as spectating/engaged in same activity elsewhere;
  3. Some audiences are interactive such as opposition and team mates/supporters/coaches/friends/parents;
  4. Presence of audience increases arousal;
  5. Increasing likelihood of dominant response occurring;
  6. If the skill is simple or well-learned, dominant response is correct response and performance improves social facilitation (*must be qualified to credit*);
  7. If the skill is complex and not well-learned, dominant response is an incorrect response and performance is impaired/social apprehension/social inhibition (*must be qualified to credit*);
  8. Credit reference to evaluation apprehension;
  9. Credit reference to interactive/supportive audience increasing effects;
  10. Credit reference to demands or expectation of audience/home and away effect/proximity of audience; *5 marks*
- (b)
1. Mental rehearsal/visualisation;
  2. Concentrate/focus on task in hand;
  3. Cut out awareness of others/distracters/improve selective attention/cue utilisation;
  4. Gradually develop experience of distracters/visit situation/build up the audience;
  5. Arousal reduction techniques/suitable examples/imagery/meditation/centering/self talk/thought stopping/PMR; *3 marks*

- (c) (i) 1. Maximal amount of oxygen/O<sub>2</sub> consumed/used/taken up;  
(Do not credit taken in/exhaled/breathing)  
2. Per minute/time; 2 marks
- (ii) 1. Oxygen consumption linked to (aerobic) energy use;  
2. Suggestion that relevance is for endurance/stamina/aerobic performance.  
(Do not credit lasting the game) 2 marks
- (d) 1. Absolute lactate threshold remains the same as fitness improves/lactate threshold is delayed;  
2. LT is when lactate begins accumulating in the blood/onset of blood lactate accumulation/OBLA;  
3. When fitter - LT occurs at a higher level of energy expenditure/workload/% VO<sub>2</sub> max;  
4. Elite/fitter performers can tolerate/buffer slightly higher levels of lactate;  
5. Because they can remove it more quickly/produce less/use other substrates;  
6. Lactate can be converted to protein/glucose/glycogen/CO<sub>2</sub> and water;  
7. Lactate as an energy substrate for aerobic energy/pyruvate. 3 marks  
(NB: Accept opposites)

4

- (a) P –  
1. Puck stationary/at rest on the ice/zero horizontal linear velocity;  
2. No/negligible net external forces acting; Sub max 1 mark
- Q –  
3. Time when stick in contact with puck/force applied by stick;  
4. Puck changing velocity/accelerating/positive linear velocity;  
5. In direction of force applied by stick. Sub max 2 marks
- R -  
6. Puck travelling with constant (horizontal) velocity;  
7. No/negligible net external forces acting/friction free; Sub max 1 mark
- S –  
8. Time when puck hits wall;  
9. Puck decelerates – (caused by force applied by wall);  
10. Eventually travels in opposite direction/negative horizontal linear velocity/  
rebounds off the wall/travels towards the performer. Sub max 2 marks
- T –  
11. Puck moving across ice with constant negative horizontal linear velocity;  
12. No/negligible net external forces acting;  
13. Reduced velocity (due to energy absorbed by impact). Sub max 1 mark  
(Do not credit speed) 7 marks

- (b) 1. Aggression – deliberate physical/verbal behaviour/ act having intent to injure and outside of rules/illegal/e.g. (*require all three to credit behaviour/intent to injure outside the rules*);  
2. Assertion – robust/vigorous behaviour/act with no intention to injure and within rules/eg (*require all three to credit behaviour/no intent to injure and within the rules*);  
3. Little difference between the two/grey area/ambiguity. 2 marks
- (c) 1. Instinct theory – innate aggression;  
2. Games for release of aggressive tendencies/catharsis;  
3. Games have opponents who try to stop/defend performers/examples/constantly fouling/blocked goals/referee's/umpire's decision;  
4. Therefore frustrating;  
5. Hypothesis that frustrations leads to aggression;  
6. Social learning – copying others/role models' behaviour/high profile players' aggressive behaviour/aggressive cues;  
7. Reinforcement by significant others/getting away with it/lack of punishment;  
8. Idea of non-catharsis leading to increase in aggression outside of sport;  
9. Importance of game leads to higher arousal/aggression. 3 marks
- (d) 1. Talking to/pre-warning players/calming;  
2. Punish aggressive behaviour/egs;  
3. Immediate sanctions;  
4. Apply rules properly/correctly/fairly/clearly/with authority;  
5. Be consistent in judgements/sanctions. 3 marks

**5**

- (a) (i) 1. Cognitive –psychological state/feelings of nervousness/apprehension/worry/negative thoughts;  
2. Somatic – physiological affects of over-arousal/stress/egs. 2 marks  
(*Do not credit mental/physical*)
- (ii) 1. Cognitive - increases gradually/days prior to competition;  
2. Once competition starts cognitive anxiety fluctuates/depends on performance;  
3. Somatic – rapid rise immediately/hours prior to event;  
4. Decreases during event. 3 marks
- (b) (i) 1. Beneficial if performer is at low level of arousal;  
2. Detrimental if performer is at a high level of arousal;  
3. If high cognitive state anxiety, continued increases in arousal leads to catastrophic deterioration in performance. 2 marks
- (c) 1. Glucose/simple sugars supplied from blood;  
2. Glycogen/complex sugars supplied from muscle/liver stores; 2 marks
- (d) (i) 1. Fat stores in adipose tissue/under the skin;  
2. Converted to free fatty acids/glycerol in blood;  
3. Lipolysis/lipases;  
4. Oxidation in muscles;  
5. Mitochondria/Kreb's cycle;  
6. (Limited) Triglyceride stores in muscle. 3 marks

- (ii) 1. Cannot be used anaerobically/sprint-type activities;  
2. Less efficient in energy yield per unit of oxygen/takes more oxygen to breakdown fat;  
3. Requires carbohydrate to run;  
4. Slower breakdown/transport;  
5. Fat – excess weight/increased energy required to perform a given task/harder to perform given task;  
6. Fat reserves act as insulating layer – preventing heat loss/leads to heat stroke.

*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*