



## General Certificate of Education

# Sport & Physical Education 5581/6581

*PED1 Physiological and Psychological Factors which Improve Performance*

## Mark Scheme

*2005 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.

# Unit 1

## General Instructions

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

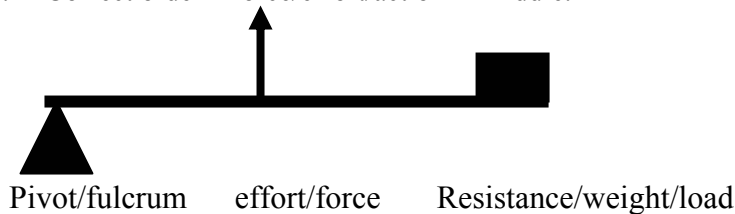
1 (a) (i)

	Type of Joint	Joint Action	Main Agonist
Shoulder	Ball & socket	(Horizontal) flexion/ adduction	Pectorals (major)/ (Anterior) deltoid
Elbow	Hinge	Flexion	Bicep

(N.B. Credit first answer only)

6 marks

- (a) (ii)
1. Third class/order lever;
  2. Correct labels (fulcrum/pivot/joint; resistance/weight/load; force/effort/action);
  3. Correct order – force/effort/action in middle.



3 marks

- (b) (i)
1. Choice reaction time;
  2. More choices/stimuli longer reaction time;
  3. Linear fashion/relationship/directly proportional
- (N.B Accept annotated graph)

2 marks

- (ii)
1. Area A – Psychological refractory period (*do not credit PRP*);
  2. Response X – Player prepares for shot/forehand/volley/backhand;
  3. Response Y – Player has to run to net/adapt to the changed flight of the ball.

3 marks

- (iii)
1. Stimulus can only be processed one at a time;
  2. But before first response can be completed;
  3. The second stimulus has occurred/arrived;
  4. They must deal with stimulus 1 and finish with it and begin to process stimulus 2;
  5. The player must respond to this second stimulus;
  6. But there is a delay (psychological refractory period)/longer time/slower reaction time;
  7. Because player stops to sort out information (ball hitting net);
  8. Player reacts too late/rushed shot/unforced error/e.g.'s/cannot return/opponent wins/player loses point.

4 marks

2 (a) (i) **Short Term Memory Sensory Store**

1. Receives information from the display/surroundings/environment/equiv;
2. From sensors/e.g.'s/equiv;
3. All or lots of information;
4. Information is filtered;
5. Selective attention.

2 marks

(ii) Short-Term Memory

1. 'Working Memory'/perception/interpretation/decision making;
2. Receive information from Short Term Sensory store;
3. Compares information from Long Term Memory;
4. Receives feedback;
5. Initiates motor programmes/effector mechanisms/messages to muscles/executive programme/equivalents.

2 marks

(iii) Long-Term Memory

1. Store of past experiences;
2. As motor programme/schema/plan of action/skills/equivalents;
3. Mental image of movement to be performed;
4. Correct information/meaningful/important/relevant information stored;
5. Information in to/from Short Term Memory.

2 marks

- (b) 1. Frequent practices/rehearsals/over learning/massed practice/repeated;
2. Feedback;
  3. Reinforcement/to praise/motivate/encourage/rewards;
  4. Highlight cues/verbal repetition of key learning points;
  5. Emphasise need to feel correct movements/attend to kinaesthesia;
  6. Use of imagery/mental rehearsal/visualisation;
  7. Transfer from previously learned skill;
  8. Fun/enjoyable/realistic;
  9. Associate with familiar information/chunking;
  10. Make information relevant/meaningful.

3 marks

- (c) (i) 1. Cardiac output is the volume/amount of blood pumped from heart/one ventricle of the heart in one minute;
2. Stroke volume is 'the volume of blood ejected (from the left ventricle of the heart) in one beat';
  3. Cardiac output = stroke volume x heart rate/ $Q = SV \times HR$ .

3 marks

- (ii) 1. Demands of the body/muscles need more  $O_2$ /increases  $CO_2$ /lactic acid/nutrients;
2. Heart rate increases/beats more;
  3. Stroke volume decreases;
  4. Ejection fraction drops/decreases;
  5. As the diastolic phase becomes shorter;
  6. Due to the loss of fluid at sweat;
  7. There is reduced plasma volume;
  8. Therefore reduced venous return;
  9. This is the Cardiovascular Drift.

4 marks

(iii) For a given cardiac output:

1. Untrained high heart rate low stroke volume;
2. Trained low heart rate large stroke volume;
3. Can only occur at sub maximal workloads;
4. At higher workloads untrained will not be able to increase their heart rate sufficiently.

*2 marks*

- 3 (a) (i) 1. Reliable means the test gives consistent results over a number of trials/same results if repeated;
2. Validity – does it measure what it claims to measure. *2 marks*

- (ii) 1. Test should involve the movements/same muscle group/actions by high jumper;
2. Energy systems used by high-jumper/specific;
3. In cycling, body weight is supported/test local muscular endurance/continuous movements;
4. Sargent/vertical jump test is a good example of sport specific test for high jumpers.

*2 marks*

(b)

<b>Joint</b>	<b>Joint Action</b>	<b>Main Agonist</b>
<b>Hip</b>	<i>(Flexion to) (Hyper) Extension</i>	<i>Gluteals</i>
<b>Knee</b>	<i>(Given on QP)</i>	<i>Quadriceps</i>
<b>Ankle</b>	<i>Plantar Flexion</i>	<i>Gastrocnemius</i>

*(First answer only)*

*1 mark for each  
5 marks*

- (c) (i) 1. Plateau

Reasons *(sub max 4 marks):*

2. Learner needs time to assimilate before moving onto the next stage;
3. Targets are set too low (or high)
5. Fatigue/lack of fitness;
6. Lack of variety of practice methods;
7. Lack of motivation/interest/boredom;
8. Physical fitness is lacking for next level;
9. Low level of aspiration;
10. Lack of ability to adapt skills/lack of feedback;
11. Limited coaching/poor coaching;
12. Reached maximum/perfect;
13. Bad/limited technique.

*Sub max 4 marks  
5 marks*

- (ii) 1. Break-up the practice session into shorter/distributed sessions/rest periods/equiv;  
 2. Re-setting of goals/task more challenging ;  
 3. Offering extrinsic rewards/encouragement/praise/positive reinforcement/equiv;  
 4. Using mental rehearsal in practice session;  
 5. Feedback to performer;  
 6. Competition against realistic opposition/match situation;  
 7. Use of whole-part-whole/part method/breaking the skill down;  
 8. Ensure performer focuses on appropriate cues;  
 9. Enjoyment;  
 10. Changing role/responsibility/position;  
 11. Make performer fitter;  
 12. Make practices more interesting/variation;  
 13. Discuss the lack of progress/explaining the plateau effect;  
 14. Better quality coaching/new coach. 4 marks

4. (a) 1. Skill – learned;  
 2. Pre-determined results with maximum certainty/intention with consistency;  
 3. Minimisation/efficiency/equiv; Sub max 2 marks  
 4. Ability – inherited/innate/traits a person possesses. 3 marks

- (b) 1. Continuous – the skill is repeated over and over again;  
 2. Gross – involves large muscles e.g. the legs;  
 3. (a) Self paced – the performer decides when to begin the skill;  
 (b) Externally paced – opposition decides by positioning (when)/force the beginning of the skill; (1 sub max either answer)  
 4. Open – decisions about when and how to dribble as the environment is changing/opponents;  
 5. Intrinsic/how it feels/kinaesthetic/extrinsic from a coach/knowledge of results/knowledge of performance/equiv;  
 6. Complexity hockey player has to process a lot of information from the environment. 6 marks

- (c) (i) 1. Brain function needs to be maintained during exercise and at rest;  
 2. Brain requires nutrients/glucose/oxygen/O<sub>2</sub>;  
 3. Cognitive thought requires nutrients. 2 marks

- (ii) 1. Muscles need nutrients/oxygen to generate energy/work;  
 2. Stimulation by sympathetic nervous system;  
 3. Or adrenaline/noradrenaline is produced;  
 4. Controlled through arterioles;  
 5. By contraction of precapillary sphincters (control blood into capillaries);  
 6. Reduction of blood flow to the liver/kidneys/abdominal organs/gut;  
 7. Opening of vessels in the skeletal muscle/skin/coronary circulation;  
 8. Vasoconstriction/vasodilation.  
 9. This occurs due to drop in oxygen/rise in carbon dioxide levels/pH levels drop/increase in acidity/increase in temperature;  
 10. Detected by chemoreceptors. 4 marks

- (iii) 1. (Muscle pump) – skeletal muscles squeezing on veins;  
 2. Valves to prevent backflow;  
 3. (Respiratory pump) – changes that occur in the thoracic cavity during inspiration;  
 4. Cause compression of the veins, resulting in blood being forced towards the heart  
 (*linked back to point 3*);  
 5. Suction of blood into the heart, due to pressure changes;  
 6. Sympathetic nerve causes venous tone/veins contract to aid return of blood during exercise. 3 marks

- 5 (a) (i) 1. Balance test – best time is 50% in practice;  
 2. When most of time was spent practising/massed;  
 3. Energy requirements are lower; Sub max 3 marks  
 4. Balancing requires little movement of major muscle groups;  
 5. The energy costs decrease with rising skill level;  
 6. Ladder Test best time is 30% in practice;  
 7. Best performances when more time spent resting/distributed;  
 8. Energy requirements are higher;  
 9. Fatigue levels would increase with more practice;  
 10. Ladder climbing requires quick and repetitive movements;  
 11. As they improve climb higher and faster Sub max 3 marks  
5 marks

(ii) **Task** (*sub max two marks*)

<i>Massed for</i>	<i>Distributed for</i>
1. Discrete/fine	4. Continuous/gross skills
2. Brief/ballistic/simple	5. Strenuous/complex
3. Safe	6. Dangerous

**Individual/Learner**

<i>Massed for</i>	<i>Distributed for</i>
7. Experienced	10. Novice
8. Fitter	11. Limited fitness
9. Highly motivated	12. Less motivated

4 marks

- (b) (i) At rest  
 1. Slight increase in ventilation;  
 2. Due to anticipatory rise;  
 3. Due to the release of hormones/adrenaline;  
 4. Stimulating the respiratory centre; Sub max 3 marks
- (ii) During exercise  
 5. Rapid rise (caused by nervous stimulation);  
 6. May plateau/steady state energy demands being met by the oxygen being made available;  
 7. Pulmonary ventilation rate = Tidal volume x breathing rate/TV x F;  
 8. Tidal volume increases/rate and depth of breathing/equiv;  
 9. Chemoreceptors/medulla;  
 10. Increase in CO<sub>2</sub>/decreased pH/increased body temperature. Sub max 3 marks  
4 marks

- (c) (i) Working at a lower intensity than that shown in Figure 9
1. Similar shape;
  2. But below the line of the first curve;
  3. Ventilation rate is lower as demands of exercise are being met;
  4. Plateau reached earlier;
  5. Energy demands are being met by the oxygen being made available/less O<sub>2</sub> is needed;
  6. Quicker recovery/steeper recovery curve. 3 marks
- (ii) After period of several months endurance training
1. Similar shape;
  2. But curve lower than ‘original intensity’ (needs to be related to the line);
  3. Performer is more *efficient* in their lung function/increased capillarisation;
  4. Energy demands are being met by lower ventilation rates;
  5. Less steep gradient;
  6. Plateau reached earlier;
  7. Quicker recovery/steeper recovery curve. 3 marks
- (Credit annotated diagrams)*

### Quality of Written Communication

The GCSE and GCE A/AS Code of Practice require 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. 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** 3 marks