GCE 2005
January Series

ASSESSMENT and QUALIFICATIONS ALLIANCE

Mark Scheme

Sport & Physical Education

PED4 Physiological, Biomechanical and Psychological Factors which Optimise Performance

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 and 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. Dividing training into periods/sections for specific purpose;
2. Macrocycle – long term plan of single year/between Olympics/world Championships;
3. Mesocycle – monthly/weeks/period of training on particular aspect;
4. Microcyle – weekly/days/individual training sessions to improve specific area;
Or
5. Training year divided into competitive phase/peaking/tapering/playing season;
6. Involving preparation phase/pre-season training;
7. Transition phase/active rest/out of season recovery. *3 marks*
(Only credit if qualified)

(b) 1. Cardiac hypertrophy/athletes heart/more muscle in wall of ventricle/increase in chamber size;
2. Increased (resting) stroke volume/increased ejection fraction;
3. Decreased resting heart rate/bradycardia;
4. Increased blood volume/haemoglobin/red blood cells;
5. Reduced exercising/maximal heart rate;
6. VO_2 max increases/increase in maximal O_2 uptake/increased a- VO_2 diff:
7. Increased stores of glycogen /triglycerides;
8. Increased myoglobin content of muscle;
9. Increased capilliarisation;
10. Increased number and size of mitochondria;
11. Increased concentrations of oxidative enzymes;
12. Increased muscle stores of ATP PC/appropriate enzymes;
13. Increased glycolytic capacity;
14. Muscle hypertrophy;
15. Increased ability to recruit more motor units;
16. Increased lactate tolerance/clearance/delayed OBLA/Lactate threshold/high percentage of VO_2;
17. Decreased body fat;
18. Increase in bone density/ligament strength;
19. Increase in maximum cardiac output;
20. Reduced EPOC.
(N.B Accept opposites) *5 marks*

(c) 1. Identifies future target/achievement/purpose/aims/objectives for the performer;
2. In order to maintain or improve performance;
3. Assists/aids motivation;
4. Evaluation of progress/improvements. *2 marks*

(d) 1. Goals should be positive/looking to improve;
2. Specific to the performer;
3. Agreed between coach and performer;
4. Formalised/written down/recorded;
5. Seen by performer as being realistic/achievable;
6. Goals must be seen as challenging by/to the performer;
7. Expressed in quantitative terms/performance goals/explanation of how the goal is measurable;
8. Using short/medium and long-term goals;
9. Subject to appropriate revisions;
10. Following evaluation;
11. Requires feedback from coach;
12. SMART/SMARTER/SCAMP. *5 marks*

2 (a) (i) 1. Forces tending to keep members within a group;
2. Forces preventing disruption of a group;
3. Forces tending to foster commitment to group norms/values;
4. Task cohesion;
5. Commitment to task;
6. Social cohesion;
7. Commitment to social goals of group. *3 marks*

(ii) 1. Generally the larger the group the greater the productivity;
2. But group can get too large;
3. Leading to formation of sub-groups or cliques;
4. And loss of productivity;
5. Breakdown in co-ordination strategies/ Ringleman effect
6. Poorly-led or disorganised groups may perform worse than smaller groups;
7. Social loafing;
8. Reduction in commitment/motivation;
9. Reduced cohesiveness if obvious/known participants;
10. Cohesion is better if they have similar status. *3 marks*

(iii) 1. Not clear whether success leads to cohesion or cohesion leads to success;
2. Usually cohesive groups lead to success;
3. Exceptions usually involved where joint goals override personal dislikes;
4. Task cohesion greater than social cohesion;
5. Many other factors involved in success apart from cohesion/e.g personality/ability/leadership are involved in success apart from cohesion.
3 marks

(b) (i) 1. Stretch target muscles to limit (of range)/equiv;
2. Hold (stretched) position for a few seconds;
3. Contract muscle group isometrically;
4. Period of relaxation;
5. Stretch target muscles again;
6. CRAC (contract/relax/agonist/contract). *4 marks*

(ii) 1. Golgi Tendon organs activated/detect stretch;
2. Muscles relax;
3. Inhibits stretch reflex/overrides/stops muscle spindles;
4. Designed to prevent overstretching/protective;
5. Allowing greater range of movement to be used. *2 marks*

(Do not credit increased flexibility)

3 (a) (i) 1. A – Drive theory;
2. B – Inverted U theory *2 marks*

(ii) <u>Drive theory</u>
1. Increases in motivational increase drive/arousal;
2. Increase in drive result in increases of probability of good performance;
3. Linear/straight line/proportional relationship;
4. But, not realistic – cannot keep improving;
5. Increase in arousal = increase in likelihood of dominant response;
6. If dominant response is well learned/expert performer/lead to increase in performance/elite/expert performance;
7. If dominant response is not efficient, probability of poor performance Increases/novice performer.

sub max 4 marks

<u>Inverted U theory</u>
8. Initially, as arousal increases so does performance;
9. Optimal level of arousal/in the zone;
10. Gives maximal level of performance;
11. Further increases in arousal result in decreases in performance;
12. Gross skills require higher levels of arousal/fine skills lower level of arousal;
13. Need to control arousal.

sub max 4 marks
7 marks

(b) 1. Ice – friction free surface;
2. During rotations angular momentum remains constant;
3. Angular momentum = moment of inertia x angular velocity;
4. Angular momentum – quantity of motion/rotation;
5. Moment of inertia – spread/distribution of mass around axis/reluctance to rotate;
6. Angular velocity = speed of rotation;
7. Change in moment of inertia leads to change in angular velocity/speed/spin of rotation;
8. Brings arms/legs closer to/further away from axis of rotation/body leads to increase/decrease in angular velocity/speed of rotation/spin;

(N.B. On diagrams mark annotations) *6 marks*

4 (a) Trait theory

1. Inherited characteristics/born with/innate/genetic;
2. Stable/enduring/unchanging;
3. Same behaviour in a variety of situations;
4. Behaviour is predictable.
5. E.g. aggressive in all situations/extrovert in all situations/etc.

Sub max 4 marks

Interactionist theory

6. B = f (PE)/behaviour is a function of personality and environment;
7. Inherited traits are amended by environment/situation;
8. Leads to stable behaviour in a certain situation;
9. Change environment change behaviour.
10. Eg: normally calm, but becomes aggressive in sport environment.

sub max 4 marks
7 marks

(b) (i) 1. 9.1 ms^{-1} (accept 9.0-9.2);
2. 0-1 seconds. *2 marks*

(ii) 1. Deceleration/decrease in velocity; *(Do not credit slowing down)*
2. Lack of ATP;
3. CP breakdown to ATP slowing/limiting;
4. Due to lack of stored PC;
5. Change to slower lactic acid/alactic/anaerobic system *3 marks*

(c) 1. A – air resistance;
2. B – gravity;
3. C – friction;
4. D – muscular force/Action Force
5. E – ground reaction force;

(Do not credit wind)

All 5 correct: 3 marks
3 – 4 correct: 2 marks
1 – 2 correct: 1 mark

5 (a) 1. At low level of exercise 50% of energy comes from fats/carbohydrates;
2. As intensity increases less fat used/more carbohydrate used;
3. At high levels of intensity carbohydrates are only energy source/no fats being used;
4. At low intensity fat/carbohydrates aerobic breakdown/using O_2;
5. Fats require more oxygen for breakdown;
6. Mitochondria/Krebs cycle;
7. At high intensity fat use limited by oxygen availability/no fats used anaerobically;
8. Slower energy release from fats/quick release of energy from carbohydrates;
9. High levels of intensity anaerobic exercise/insufficient oxygen;
10. Glycolysis;
11. Lactate formation. *6 marks*

(b) (i) 1. Aggression – intent to harm;
2. Outside laws of game/illegal;
3. Assertion – no intent to harm;
4. Within laws/legitimate. *3 marks*

(ii) 1. Instinct/trait theory/innate/ born with aggression; *(must qualify to credit)*
2. Aggressive in all situations including sport;
3. Possible that aggression may be channelled/reduced through sport;
4. Catharsis/letting off steam;

5. Frustration leads to aggression/frustration-aggression hypothesis; *(must qualify to credit)*
6. Defending/game/opponents/referee making bad decisions creates frustration leading to aggression;
7. Tendency for sport to increase aggression;

8. Social learning – learned through observation; *(must qualify to credit)*
9. Imitation and reinforcement;
10. Possible to learn that aggression can lead to success;
11. Instrumental aggression;
12. Especially when not punished or accepted as normal/reinforced;
13. Hence need for officials to punish aggressive behaviour;
14. To control its incidence;
15. Aggressive cue hypothesis – trigger response through previous negative experiences.

(Points must be related to theory in order to credit) *6 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*