



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme January 2003

GCE

Sport and Physical Education

Unit PED4

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Unit 4: Physiological, Bio-mechanical and Psychological Factors which Optimise Performance

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

- 1 (a) 1 **Forming** - get to know how each work;
2 **Storming** - establish roles within the team;
3 **Norming** - co-operation, working towards common goals;
4 Performing- roles and relationships established.
(N.B Must qualify to gain mark) 4 marks
- (b) 1 Task cohesion – How well a group works together to complete a task
Social cohesion - How well they interact and support each other;
(1 mark only available if both definitions are given)
2 Social cohesion may improve working together
3 Successful teams display high levels of task cohesion;
4 Performance success will often lead to social cohesion;
5 High social cohesion can affect the competitive nature of the group and affect task cohesion;
6 Value of social cohesion is debatable;
7 Successful teams do not need to have high levels of social cohesion if there is a high commitment to the common goal/high task cohesion.
4 marks
- (c) 1 Number of motor units determined by height required;
2 Large number of motor units –greater height/vice versa;
3 Motor units have to follow **all or none** law, if activated **all** fibres contract;
4 Motor units requiring large numbers of muscle fibres will be used. 3 marks
- (d) 1 Muscle spindles measure/monitor tension/force in muscle
2 Stimulated by excessive tension/force;
3 Conduct signals to bring about reflex inhibition of muscles/stretch reflex;
4 Increased activity of GTO results in decreased strength of contraction;
5 Golgi tendons cause motor neurons to be inhibited;
6 Training reduces or counteracts these inhibitory impulses (desensitise GTO);
7 Therefore strength gains can be made by these muscles.
(Only credit point 7 if they link it to point 6) 4 marks

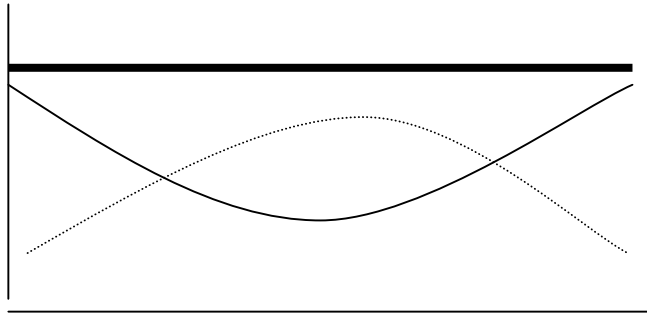
- 2 (a) 1 Generally described to differences in body composition-more body fat;
2 Even trained females have more body fat than their male equivalents;
3 Males have more muscle/generate more aerobic energy/mitochondria/myoglobin;
4 Greater concentration of haemoglobin;/red blood cells/ eurythrocytes
5 But trained females can exceed the values of men;
6 Activity patterns and social constraints can account for the differences;
7 Larger heart size/larger stroke volume/ increased cardiac output. *4 marks*
- (b) 1 Preparation /base/ foundation cycle as long as possible;
2 Move from aerobic to higher intensity;
3 Speed/power training-emphasis on more intensity;
4 Taper towards to competition.
or
1b Macro cycle-yearly or longer cycle;
2b Meso cycle-monthly or specific aspect of fitness;
3b Micro- weekly or individual sessions.
(*N.B Do not credit pre-season*) *3 marks*
- (c) 1 Crowd can cause arousal optimal on performance/ positive effect on performance
2 Over arousal/anxiety detrimental effect on performance/ social inhibition;
3 Evaluation/judgement of performance by other competitors/coaches/crowd/evaluation apprehension;
4 Suggests lacking in confidence with activity;
5 Distraction theory (distracted by others, unable to concentrate on task);
6 Dominant response given when under pressure;
7 Novices dominant response is incorrect/unsuccessful generally/ elite performer dominant response is usually correct/successful. *4 marks*
- (d) 1 Research on performers suggests more wins at home than away/home field advantage;
2 Advantage in early rounds of competition;
3 As you progress in the competition more danger of cracking under you own crowd/ can have a negative effect on performance/ high expectancy of crowd
4 Intimacy of the crowd/equiv.;
5 Supportive crowd may have +ve or -ve effect on performance. *4 marks*

- 3 (a) (i) Newton's 1st law = force is applied is large enough to overcome the inertia of the athlete/equiv;
Newton's 2nd law = the greater the force applied by the athlete the greater the acceleration in the **direction of the force**;
Newton's 3rd law = athlete exerts force on starting blocks and the blocks exert an **equal and opposite** reaction force on the athlete. 3 marks
- (ii) 1 Ground reaction force
2 Weight/mass \times gravity
3 Friction;
4 Air resistance (N.B do not credit wind resistance) (accept lists) 3 marks
- (iii) 1 ATP is the principal energy source;
2 PC is required to resynthesise ATP;
3 As PC is used up performance deteriorates./change to lactic acid system;
4 Lactic acid system provides energy more slowly/reforms ATP more slowly. 2 marks
- (b) (i) 1 Successful athletes were above on vigour,
2 But below the line in terms of more negative moods, tension, depression, anger, fatigue and confusion.
(Require a minimum of three moods to credit mark)
3 Iceberg profile;
4 But positive mental health does not imply success. 3 marks
- (ii) 1 Valid test when still some difficulty understanding personality;
2 Self answer questions affected by moods, attitude to tests/training;
3 Respondents may not answer honestly or accurately/ misinterpretation;
4 Type of questionnaire-yes or no limited value;
5 Average scores obscure wide individual differences;
6 Highly successful athletes do not always exhibit an iceberg profile;
7 Only moderately predictive/ a measure of moods rather than a global and stable personality traits.
(N.B Only credit statement of validity if qualified) 4 marks

- 4 (a) A= Angular momentum;
B= Moment of inertia;
C= Angular velocity.

1 mark for each one correct answer
3 marks

- (b) 1 Because body is in a layout position/mass distributed away from axis of rotation;
2 The moment of inertia would be larger;
3 The angular velocity would be slower;



If diagram is used
and clearly shows a
lower/slower angular
velocity and a larger
moment of inertia
and conservation of
angular momentum

3 marks

- 4 Change in moment of inertia results in a change of angular velocity
5 Because of the law of conservation of angular momentum.
6 The amount of angular momentum would be the same;
8 Angular momentum = moment of inertia \times angular velocity.

5 marks

- (c) 1 Performer will focus on external factors- the trampoline was not right etc;
2 Coach will focus on internal factors-not trying sufficiently etc.

2 marks

- (d) 1 Learned helplessness- strong reaction to/expectation of failure;
2 Blaming lack of ability/not technique;
3 Can be global or specific;

(sub max 2 marks)

- 4 Coach does not emphasise/ lack of ability
5 Coach should focus on lack of consistency in technique/lack of experience of insufficient effort;
6 (Motivation) Can be maintained by setting realistic goals;
7 Teaching failure is not inevitable-attribution retraining;
8 Allow performer to experience success/remind of previous success/equiv.

5 marks

- 5 (a) 1 Accurate definition of aggression –Intent to harm or injure outside the rules of the game;
2 Instinct theory innate trait/ tendency of aggression
3 Catharsis- discharging aggression (in a positive manner);
4 Reduce antisocial, destructive behaviour/ Off the field of sport/equiv;
5 Appropriate example (must be outside the law of the game)
6 Participation in sport tends to increase aggression;
7 Sports people should show lower levels of aggression;
8 Aggressive sports does not reduce aggression in others; *4 marks*

- (b) 1 Officials empathise with players;
2 Officials give decisions clearly/with authority.
3 Officials can only operate within the frame work of the game;
4 Apply the rules correctly/ appropriate examples;
5 Punish aggressive behaviour **immediately**;
6 Officials are consistent interpretation and sanctions allowed/unbiased;
7 Officials apply consistency from start of competition. *3 marks*

- (c) 1 Walking – free fatty acid /triglycerides/fats;
2 Sprinting-muscle glycogen/ATP/carbohydrates/PC;
3 Jogging-mixture of fatty acids and muscle glycogen/fats/carbohydrates *3 marks*

- (d) 1 Less efficient energy yield per unit of oxygen;
2 Cannot be used anaerobically for sprint type activities/ can **only** be used aerobically;
3 Requires the presence of carbohydrates to be used;
4 Slow to produce energy/ insoluble in blood. *2 marks*

- (e) 1 Greater Creatine Phosphate utilisation ;
2 To restore ATP quickly;
3 Insufficient time available to breakdown glycogen; *sub max 2 marks*
4 Greater oxidative utilisation of glycogen/ glycogen can be used aerobically;
5 Glycogen can be accessed for longer periods of time at lower intensities; *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 - 3marks*

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