GCE

Sport and Physical Education
6581

PED1
Physiological and Psychological Factors which Improve Performance

Mark Scheme
2009 examination - Jan 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.
1. (a) (i) 3 marks for 3 of:
   1. Flexion/extension to flexion
   2. Quadriceps/rectus femoris
   3. Eccentric/isotonic

   (a) (ii) 2 marks for 2 of:
   1. Saggital/median plane
   2. Transverse/horizontal/medio-lateral axis

   (b) 4 marks for 4 of:
   1. Cardiac Hypertrophy/Hypertrophy of heart/athletes heart
   2. Increased thickness of ventricle wall/larger ventricular cavity/thicker myocardium
   3. Increased ejection fraction/increased proportion of blood ejected
   4. Increased contractility/increased force of contraction/heart beats stronger/more powerful
   5. Increased stroke volume/blood ejected per beat
   6. Greater diastolic filling/pre-load
   7. Starlings Law
   8. Increased maximum cardiac output
   9. Lower resting heart rate/bradycardia
   10. (Increased) capilliarisation

   (c) (i) 5 marks for 5 of:
      (sub max 1)
      1. The will/want/willingness to succeed/desire to learn/achieve success/drive
      (sub max 4)
      2. Intrinsic – internal to the performer/within the performer
      3. Eg satisfaction/feel good factor/self fulfilment/self worth for achieving PB
      4. Extrinsic – external – to the performer/outside the performer/from a coach/other
egs of outside source
      5. Tangible eg prize/trophy/medals/badges/certificates/money
      6. Intangible eg praise from teachers or coach/applause

   (c) (ii) 4 marks for 4 of:
   1. Provide feedback/knowledge of results/knowledge of performance
   2. Variation in training
   3. Make it fun/enjoyable
   4. Use external rewards/prizes/certificates
   5. Allow success/competitions/group similar abilities together
   6. Ensure understanding of the relevance of training activities
   7. Use role models
   8. Avoid punishment
   9. Use positive reinforcement/verbal encouragement/praise/smile
   10. Set (personal)/challenging/achievable/goals/targets

2. (a) (i) 4 marks for 4 of:
   1. Knowledge of initial conditions/environment conditions/where you are
   2. Knowledge of response specifications/response demands/what to do
   3. Sensory consequences/kinaesthesia/knowledge of performance/KP/feel of the skill
   5. Consists of recall and recognition schema
(a) (ii) 4 marks for 4 of:
1. Practice/experiences/situations to be varied
2. Should include plenty of information/overview
3. Should have (frequent) feedback (continuous and terminal)
4. Should be realistic to the activity/game/sports specific/conditioned game
5. Should include transferable elements (eg from other sports)
6. Becoming more challenging/more difficult
7. Slow motion practices/video analysis/visual aids/guidance
8. Ensure players are aware of transfer possibilities

(b) (i) 2 marks for 2 of:
1. Health – ‘a state of complete mental, physical and social well being (not merely the absence of disease or infirmity’)
2. Fitness – the ability to meet the demands of their environment or lifestyle

(b) (ii) 5 marks for 5 of:
1. Validity – does it test what it claims to test?
2. Reliability – repeatable results/consistency with the same method
3. Ensure test is sports specific
4. Eg should use specific muscle groups/actions
5. Use a recognised/appropriate protocol/procedure
6. Ensure procedures are carried out properly/accurately/allow relevant example eg correct cadence must be maintained/full extension of legs on stepping up/rate of stepping must be maintained/height of steps must be accurate in line with protocol/other appropriate eg linked to other named tests
7. Take precise accurate measurements/allow relevant eg - heart rate measured accurately
8. Ensure equipment is standardised/tester is experienced/familiar with protocol
9. Try to take account of variables eg motivation of performer/testing environment/presence of others/allow other relevant eg's
10. Take an average/repeat the test several times (in order to minimise any errors)
11. Ensure tester has knowledge to interpret results

(c) 3 marks for 3 of:
1. Speed – speed to move into position/play ball/of thought eg speed to beat opponents
2. Agility – to beat opponents/change direction/eg to move past an opponent in football or rugby
3. Power – to jump into the air/to break/make tackles
4. Balance – to ride tackles/make passes/shoot
5. Flexibility – to reach ball
6. Muscular endurance – to keep repeating movements eg continue to pass/shoot throughout the game
7. Body composition – look for eg that is relevant to the position/game
8. Strength – look for eg showing where they apply force where necessary eg strong tackle/scrum
9. Co-ordination – to get (hands) to the ball
3. (a) (i) 4 marks for 4 of:
1. Resistance/load/weight
2. Fulcrum/pivot
3. Effort/force
4. First class

(a) (ii) 5 marks for 5 of:

Shoulder – joint action
1. Horizontal flexion/horizontal adduction
Shoulder – agonist
2. Pectorals/deltoid
Shoulder - type of contraction
3. Concentric/isotonic
Elbow – joint action
4. Flexion
Elbow – agonist
5. Biceps

(b) (i) 2 marks for 2 of:
1. Intrinsic feedback – from within the performer/from the proprioceptors/the sense of kinaesthesia/how it feels
2. Knowledge of performance – knowledge about the reasons for success or failure/information regarding the movement pattern/view of technique

(b) (ii) 3 marks for 3 of:
1. The correction of errors/improve techniques/highlight weaknesses/promoting learning/developing motor programmes/equiv
2. Reinforcement/illustrate success/high-light strengths/equiv
3. Motivation/self confidence/ encouragement/equiv

(b) (iii) 4 marks for 4 of:
1. Phase/stage of learning/skill level of the performer
2. Terminal/positive feedback better for beginners/(positive for low self confidence) or concurrent/negative feedback better for advanced/(negative for high self confidence)
3. Type/nature of the skill eg complexity/organisation/classification
4. Relevance of feedback/meaningful/useful/clear/accurate/focused/specific/appropriate to the performer
5. Timing of feedback/provide feedback immediately/as soon as possible/terminal
6. Quantity of feedback/succinct/short/not too much or too little/ST memory has a limited capacity/can only process limited amount at a time
7. Which methods to use/different methods such as visual and verbal
8. It must encourage the performer to recognise intrinsic feedback – learning to feel the different movements
9. Record the feedback for subsequent reflection
10. It must be to the individual, rather than to the group
4. (a) (i) 3 marks for 3 of:
1. Oxygen moves from inside the lungs/alveoli into the blood and carbon dioxide moves from the blood into the lungs
2. Due to process of diffusion/movement from a high concentration to a low concentration/diffusion gradients
3. Partial pressure of oxygen/pO2 is higher in the lungs than in blood and partial pressure of carbon dioxide/pCO2 is higher in blood than in the lungs

(a) (ii) 3 marks for 3 of:
1. One cell thick alveoli/thin (epithelial) membrane and capillary walls
2. The inside of the alveoli is moist
3. Large surface area of alveoli/capillary density
4. A short diffusion pathway/nearness of capillaries
5. Blood cells travel through the capillary relatively slowly/almost in single file/compression of red blood cells
6. A large concentration of gradient always exists

(a) (iii) 3 marks for 3 of:
1. More oxygen consumed/used/taken in/less breathed out and more carbon dioxide breathed out
2. Greater differences between inspired and expired values during exercise than between inspired and expired values at rest
3. Oxygen for energy/muscle contraction/respiration/work
4. Carbon dioxide produced as a waste product/by-product

(b) (i) 5 marks for 5 of:
1. Motor programme – pre-determined set of neural commands/nerve impulse that control the execution of each particular movement/set of instructions
2. Made up of sub-routines/plan of action/equiv
3. Allow an eg/description of how sub-routines form a motor programme
4. Stored in long term memory/pre-planned set of specific muscle commands/equiv
5. Formed by practice/repetition/past experiences
6. Images are built up/add to motor programme until correct/sub-routines developed
7. Executive programme/perfect image stored
8. Repetition cause storage of effective actions as a plan of action and of the stimuli that precede it
9. Ineffective actions discarded
10. Only needs one stimulus to trigger the whole motor programme
4 marks for 4 of:
(sub max 3)
1. Memory trace
2. Used for selecting and initiating/performing movement
3. Operates as an open loop system
4. Does not control movement
(sub max 3)
5. Perceptual trace
6. Used as a point of reference/memory of past movements/compares to past experience
7. Uses feedback/determines the extent of movement in progress
8. Makes ongoing adjustment of the movement

5. (a) 3 marks for 3 of:
1. Tidal volume – the volume of air inspired or expired in one breath
2. Minute ventilation – the volume of air which is inspired or expired in one minute
3. Respiratory frequency – the number of breaths taken per minute

(b) (i) 3 marks for 3 of:
1. Similar shape/but above the line of the first curve
2. Ventilation rate is higher
3. To meet demands of exercise
4. Plateau reached later/higher
5. Energy demands need to be met by oxygen being made available/more O₂ is needed
6. Slower recovery/longer recovery

(b) (ii) 3 marks for 3 of:
1. Similar shape but below the line of the first curve
2. Performer is more efficient in their lung function/increased capillarisation
3. Energy demands are being met by lower ventilation rates
4. Less steep gradient plateau reached earlier
5. Quicker recovery/steeper recovery/shorter recovery/faster recovery (curve)

(c) (i) 3 marks for 3 of:
1. Transfer of learning – the influence or effect of performing or practising one skill on the learning of another skill/skills learnt in one activity affect/influence/impact on another
2. Proactive transfer – learning a new skill is affected by one we already know; learning a skill now will affect future skills
3. Retroactive transfer – when a skill being learned has an effect on a previously learned skill
(c) (ii) 6 marks for 6 of:

1. Positive transfer – likely when skills have highly similar actions/depending upon similar motor abilities/same muscles/movements

2. Appropriate illustration eg tennis serve and volleyball serve, chest pass in basketball or netball

3. Negative transfer – likely when two skills are similar but not identical actions using similar abilities in slightly different ways, such that they interfere with each other/when initial skills here have been well learned

4. Appropriate illustration eg playing strokes in badminton and tennis have similar actions but subtle differences (wrist action)

5. Zero transfer – likely when two skills have dissimilar movement patterns/using differing abilities and the two skills do not interact

6. Appropriate illustration of two completely different skills eg golf drive and front crawl