

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Advanced Subsidiary Level

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

9396 PHYSICAL EDUCATION

9396/13

Paper 1 (Theory), maximum raw mark 90

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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International Examinations

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Section A
Anatomy and Physiology

- 1 (a) **Total of 5 marks**
sub max 2 marks for structural characteristics
sub max 2 marks for functional characteristics
(not large or pale in colour)

Structural characteristics		Functional characteristics	
1	They contain smaller amounts of myoglobin	7	They have a high anaerobic capacity/work anaerobically
2	They have fewer/smaller mitochondria	8	They fatigue relatively quickly
3	They have a less developed blood supply	9	They contract with a lot of force/strength
4	They have more fibres per motor neurone/more fibres per motor unit	10	They have a fast speed of contraction
5	They have larger motor neurones		
6	They contain greater amounts of glycogen		

sub max 1 mark for

- 11 Fast glycolytic fibres recruited during high intensity activities requiring power/speed e.g. sprinting, fast bowling, long jump, gymnastic vault etc [5]

(b) 4 marks from

- 1 Both the rotator cuff muscle and the multifidus muscle provide stability for unstable joints
- 2 The rotator cuff muscles help to hold the head of the humerus into the shallow socket on the scapula
- 3 Important during sports with high impact (rugby) to help avoid dislocation
- 4 Important during sports that involve vigorous arm action to avoid ligament damage
- 5 The multifidus muscle helps provide core stability/stability of the lower spine
- 6 Important in sports that absorb a lot of force/impact through the lower back e.g. tackle in rugby/tennis serve/fast bowling action
- 7 Contract prior to movement to protect from injury
- 8 Can be trained through mental rehearsal [4]

(c) Total of 6 marks

2 marks sub max area A

- 1 Adrenaline is released (by the body)
- 2 Acts directly on the SA node to increase heart rate

2 marks sub max area B

- 3 Chemo receptors/baroreceptors/proprioceptors send information to the medulla oblongata/CCC
- 4 The medulla oblongata/CCC responds by increasing stimulation of the sympathetic nerve to the SA node to increase heart rate

2 marks sub max area C

- 5 Exercise intensity remains the same
- 6 The oxygen supplied to the muscles meets demand so no increase required/steady state
(Not allow just plateau without explanation) [6]

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(d) 5 marks from

(must be in order)

- 1 Stimulus from brain/medulla oblongata/cardiac control centre sent (via sympathetic nerve)
- 2 Acts on the SA node
- 3 Wave of conduction spreads across both atria/ wave of excitation
- 4 Causing atria to contract
- 5 Impulse travels to the AV node
- 6 Impulse travels down the bundle of His to the bottom of the heart
- 7 Impulse spreads through purkinje fibres
- 8 Causing ventricles to contract/ventricular systole

[5]

(e) 4 marks from

- 1 Oxygen combines with haemoglobin to form oxyhaemoglobin
- 2 Oxygen dissolves in the plasma of the blood
- 3 Carbon dioxide combines with haemoglobin
- 4 Carbon dioxide dissolves in the plasma of the blood
- 5 Carbon dioxide dissolves in water to form carbonic acid

[4]

(f) 6 marks from

- 1 If more O₂ is being used in the cell during exercise, diffusion gradient is increased
- 2 The steeper the gradient, the faster oxygen will diffuse into the cell
- 3 Because of the increase in difference of the pp O₂ in the capillary compared with the pp O₂ in the cell
- 4 As body temperature increases with exercise, O₂ will dissociate more readily from haemoglobin
- 5 A drop in pH (increase acidity/lactic acid presence) will cause O₂ to dissociate more readily from Hb (increase in hydrogen ions which combine with protein part of Hb so ability to bind with oxygen decreases – the Bohr effect)
- 6 The amount of CO₂ increases in the cell due to exercise (as a by product of aerobic respiration)
- 7 The CO₂ diffusion gradient between the cell and the capillary increases
- 8 As carbon dioxide levels rise, so does the level of hydrogen ions so O₂ dissociates more readily
- 9 With the increase in CO₂ oxygen in tissue capillaries will dissociate more readily from Hb
- 10 Because Hb has a higher affinity for CO₂ than oxygen (Seeley Stephens & Tate)
- 11 Gases always move from areas of high concentration to areas of low concentration
- 12 Gaseous exchange of O₂ from the alveoli to the muscle cells takes place owing to lower partial pressure of O₂ in the muscle cells than in the capillaries.
- 13 Gaseous exchange of CO₂ from the muscle cells to the alveoli takes place owing to a higher partial pressure of CO₂ in the muscle cells than the capillaries.

[6]

[Total: 30]

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Section B

Acquiring, Developing and Performing Movement Skills

2 (a) Total of 4 marks

Sub max 2 from each sport

Allow named abilities for tennis and for hockey

(abilities)

2 marks (abilities for tennis)

Underlying abilities related to a racquet game e.g. speed/reaction time/hand-eye co-ordination

2 marks (different) (abilities for hockey)

Underlying abilities related to team games e.g. strength/stamina/response orientation [4]

(b) (transfer)

(i) (positive/negative) 4 marks for :

- 1 (Positive) - one skill can help the performance of another
- 2 Suitable practical example
- 3 (Negative) - one skill can hinder the performance of another
- 4 Suitable practical example

[4]

(ii) (optimising) 4 marks for 4 of :

- 1 Training relevant/'identical elements' theory/similar
- 2 Environment similar in training/ competitive situation/ realism of situation
- 3 Highlight importance/ understanding of transfer to performer
- 4 Skills must be learned well first to optimise effects
- 5 Manipulation of skills/part teaching/splitting into subroutines
- 6 Basic to complex skills teaching
- 7 Reinforcement/rewards /+ve feedback

(no schema)

[4]

(c) Total of 6 marks

(S-R bond)

(must use practical examples)

2 marks for meaning of S-R bond from 2 of :

- 1 A response is closely related to a stimulus/learning to respond to a certain stimulus
- 2 Conditioned by stimuli which are connected to appropriate responses relevant example e.g. a forehand in tennis performed (response) when ball is on the appropriate side of the body (stimulus)

4 marks for 4 of : (must use practical examples to show strengthening of bond)

- 3 Reinforcement
- 4 Negative reinforcement
- 5 Rewards
- 6 Repetition /drills /intense training (Thorndike's) law of exercise
- 7 Showing benefits/understanding/cognitive aspects of skill learning
- 8 Teach as a whole to help this understanding
- 9 (Thorndike's) law of effect/giving a 'satisfier' rather than an 'annoyer'/praise
- 10 (Thorndike's) law of 'readiness'/physical/mental preparation
- 11 Feedback on performance/information to correct errors

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- 12 Increasing determination/self-motivation/inner drive
 - 13 Enhancing interest in activity
 - 14 Specific mental preparation e.g. selective attention
- [6]

(d) 4 marks for 4 from:
(a suitable motor skill must be identified for marks to be awarded)
(max of 3 marks per classification)

(Open)

- 1 Predominantly perceptual/needs a lot of perception/judgement/interpretation.
- 2 There is much information to process/the skill is more complex.
- 3 The environment/others affects the skill performance.
- 4 Rapid adjustments of the skill needed.
- 5 Takes place in an externally placed environment.

(Closed)

- 6 Predominantly habitual/the same patter of movements is repeated.
- 7 There is little information to process/the skill is simple/fewer stimuli/responses.
- 8 The environment does not affect the skill/others do not affect performance.

(Discrete)

- 9 The skill has a clear beginning and end.
- 10 The skill has low organisation/usually brief in nature/single specific skill.
- 11 If the skill is repeated have to start at the beginning.

(Serial)

- 12 The skill is made up of two or more discrete elements/have to be done in the correct order.
- 13 Sub routines are readily separated.
- 14 There are separate skills involved in the whole movement.
- 15 The skill has low organisation.
- 16 Each element has a clear beginning and end.

(Continuous)

- 17 The skill is flowing/fluent/the end of one sub routine becomes the beginning of the next.
 - 18 Skill cannot easily be split up into sub-routines.
 - 19 The skill has high organisation.
- [4]

(e) 4 marks

- 1 Skill is treated holistically/wholeness
 - 2 Gestaltist approach/insight.
 - 3 Learner develops an understanding of skill/skill requirements/links between S+R.
 - 4 Learner draws together intervening variables/aspects of the environment/display.
 - 5 Process of problem-solving/trial and error/finding out.
 - 6 It is an intellectual/perceptual process
 - 7 Allows performer to adapt to new situations effectively/allows modification of skill.
- [4]

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(f) 4 marks for 4 from:

(max of 2 marks if no practical example – e.g. catching the ball near the boundary in cricket – has time to act on feedback and movements are controlled via intrinsic information)

- 1 Involves feedback/accept diagram showing feedback.
- 2 There is time with this control to act upon feedback/explains slower movements
- 3 This control is internal.
- 4 Involves proprioceptors/kinesthesia
- 5 Information used to detect errors
- 6 Error detection can lead to error correction/put things right
- 7 Movements initiated by a memory trace
- 8 Memory trace triggers the perceptual trace
- 9 Performer continuously matches memory trace with perceptual trace (Adams' theory)
- 10 Occurs on two levels
- 11 Level 2 sub conscious/level 3 conscious

[4]

[Total: 30]

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Section C
Contemporary Studies

LISTS NOT ACCEPTABLE – MUST WRITE IN SENTENCES

3 (a) Total of 4 marks
2 marks for 2 of:

Similarities

- 1 No pressure /obligation to take part/voluntary/freedom of choice
- 2 Satisfaction gained from taking part/self fulfilment
- 3 Incorporates a range of activities/ both are spontaneous/ low organisation
- 4 Social development
- 5 Intrinsic value/take part in activity for its own sake/enjoyable

2 marks for 2 of:

Differences

- 6 Children master reality through play: adults escape reality through recreation
- 7 By product of recreation is relaxation recuperation: by product of play is learning/fun
- 8 Recreation occurs in leisure time: play occurs any time
- 9 Recreation modifies rules: children make up rules [4]

(b) 5 marks for 5 of:

- 1 Develop physical skills
- 2 Directs the use of physical skills to perform a range of activities
- 3 Physical development/health and wellbeing/knowledge of the body in action
- 4 Provides creative opportunities
- 5 Teaches pupils to be part of groups and teams/social
- 6 Learn how to plan, perform and evaluate actions/learn rules/ cognitive development
- 7 Develop confidence
- 8 Helps to make choices relating to life long activity/encourages participation/job opportunity
- 9 Teaches values e.g. fair play/sportsmanship [5]

(c) 4 marks for 4 of:

- 1 A healthy work force/fitter nation
- 2 Lessen the cost of health care
- 3 Persuade people away from social unrest
- 4 Gives people an/alternative /avenue for succe
- 5 Creates a socialisation process
- 6 Possible economic benefits to a nation through high levels of achievement
- 7 Provide enjoyment
- 8 National pride/more medals [4]

(d) 3 marks for 3 of:

- 1 Punishments for players who commit offences/ban /fine
- 2 Have positive role models
- 3 Increase peer pressure
- 4 Educate players in advantages of lack of violence
- 5 Give fair play awards [3]

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- (e) (i) **4 marks for:**
Must apply to examples from sport to gain marks
2 marks for 2 of:

(sportsmanship)

- 1 Fairness e.g. going for the ball /not the player when tackling
- 2 Applauding opponents play
- 3 Shaking hands/cheers at the end of a game/observing etiquette/respect opponent
- 4 Observing/playing to the rules
- 5 Accepting referee's decisions
- 6 Lose gracefully
- 7 Kicking the ball out of play when an opponent is injured

- Must apply to examples from sport to gain marks**
2 marks for 2 of:

(gamesmanship)

- 1 Bending the rules to gain an advantage/taking more time at change of ends in tennis/time wasting
- 2 Tactical ploys to put off an opponent/blocking entry into penalty areas
- 3 Not allowing opponents to show skills/fouling when through to goal
- 4 Questioning referee's decisions

[4]

- (ii) **3 marks for 3 of:**

- 1 Increasing numbers of legal prosecutions in sport e.g. drug offences
- 2 Pressure of winning/win at all costs mentality
- 3 High rewards for winning/monetary rewards
- 4 Media hype on big events
- 5 Spectator behaviour encourages players
- 6 Declining moral standards in society/less suitable role models

[3]

(f)

POSITIVE	NEGATIVE
1. Changes to format to give more excitement	2. Changes the tradition of sport
3. Breaks so that sponsor can advertise	4. Play lacks continuity
5 Injection of funding/ higher monetary rewards	6. Rich super stars/play for money
7. Allows choice of programmes/sports to watch	8. Some sports only available on exclusive channels
9. Improve participation	10. Reduce participation/encourages couch potato
11. Make all coverage exciting	12. Media hype can be detrimental
13 In depth analysis/action replays	14. Athletes are under pressure/action replays show dysfunctional parts
15. Educate public about sport/raise profile of minor sports	16. Reinforces stereotypes/e.g. young male/lesser coverage e.g. women
17. Creates role models	18. Athletes can be over played/season becomes too long
19. Encourage more sports to become professional/performers train and improve performance.	20. Business sponsors/owners have too much control/influence

[7]

[Total: 30]