

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary and Advanced Level

MARK SCHEME for the November 2004 question papers

8666 PHYSICAL EDUCATION

8666/01 Paper 1 (Theory),
maximum raw mark 100

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the November 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.



Grade thresholds taken for Syllabus 8666 (Physical Education) in the November 2004 examination.

	maximum mark available	minimum mark required for grade:		
		A	B	E
Component 1	100	69	62	40

The thresholds (minimum marks) for Grades C and D are normally set by dividing the mark range between the B and the E thresholds into three. For example, if the difference between the B and the E threshold is 24 marks, the C threshold is set 8 marks below the B threshold and the D threshold is set another 8 marks down. If dividing the interval by three results in a fraction of a mark, then the threshold is normally rounded down.

November 2004

GCE AS/A LEVEL

MARK SCHEME

MAXIMUM MARK: 100

SYLLABUS/COMPONENT: 8666/01

PHYSICAL EDUCATION



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Section A Applied Anatomy and Physiology

Question 1

- (a) Fibrous Joint
 (Description) – two bones joined by fibres (1 mark)
 (Example) – skull/coccyx (1 mark)

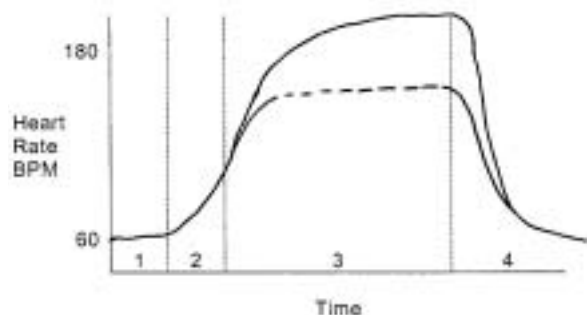
Total 2 marks

- (b) Movement Analysis: 1 mark for each
 A – Femur and Pelvis
 B – Hinge
 C – Condylod
 D – Radius and Carpals

Total 4 marks

- l(i) The candidate's response will vary as the type of exercise has not been specified in the question. The mark scheme will have to take into account graphs showing a maximal response to exercise and a sub-maximal response.

Heart Rate Graph



5 marks for 5 of:

- 1 Area 1 – resting heart rate approximately 60–70 bpm
- 2 Area 2 – anticipatory rise
- 3 Area 3 – exercise rate – plateau shown approximately 180 bpm
- 4 Area 4 – sharp drop initially followed by gradual return to resting heart rate
- 5 Both axes correctly labelled
- 6 Overall shape of graph

Total 5 marks

- (ii) Heart Rate and Exercise: 1 mark for each
 Pre-exercise: prior to exercise commencing slight increase in heart rate due to release of adrenalin/anticipatory rise.

Exercise: heart rate increases intensity increases but slows down prior to maximum heart rate/plateau achieved, heart at optimal steady state.

Heart rate plateaus when oxygen supply meets oxygen demand/as intensity increases to maximum, demand for oxygen continues to rise so heart rate continues to increase to maximum.

Post-exercise: rapid decrease immediately after exercise/followed by gradual return to resting heart rate.

Total 3 marks

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- (iii) Intrinsic Control of Heart Rate: 2 marks for 2 of
- 1 (Temperature) An increase in temperature increases heart rate
 - 2 (Venous Return) Venous return increases heart rate which increases stroke volume (Starling's law)
 - 3 Increase in stretch allows increased filling/increase pre-load on cardiac tissue
 - 4 Increase in stretch stimulates SA node
- Total 2 marks**
- (d) Lung Volumes: 2 marks for each – 1 for description and 1 mark for resting volume – must include units.
No resting volume given: candidates may give either male or female volumes – responses could vary considerably.
- (i) Vital Capacity
Description: the maximal volume of air that can be expired after a maximal inspiration (1 mark)
Resting Volume: 4600ml (4.6 dm³) (1 mark)
- (ii) Residual Volume
Description: volume of air left in the lungs following maximal expiration (1 mark)
Resting Volume: 1200 ml (1.2 dm³) (1 mark)
- (iii) Total Lung Volume
Description: the vital capacity plus the residual volume (1 mark) Resting Volume: 6000 ml (6.0 dm³) (1 mark)
- Total 6 marks**
- (e) Neural Control of Ventilation: 3 marks for 3 of:
- 1 Inspiratory centre increases stimulation of respiratory muscles (external intercostals and diaphragm)
 - 2 (Stimulation) of sternocleidomastoid, scalenes and pectoralis minor muscles to increase force of contraction/depth of inspiration
 - 3 Further increase in volume increases pressure gradient
 - 4 Therefore volume of air inspired increases
 - 5 During exercise expiration becomes active
 - 6 (Stimulation) of internal intercostals and abdominals reduces volume of thoracic cavity
 - 7 Increase in pressure forces air out of lungs
- Total 3 marks**

TOTAL FOR QUESTION: 25 MARKS

Question 2

- (a)(i) Concentric Muscle Contraction:
(Description) Muscle shortens under tension/insertion moves towards origin (1 mark)
(Example) Bicep Brachii upward phase of bicep curl (1 mark)
- (ii) Eccentric Muscle Contraction:
(Description) Muscle lengthens under tension/insertion moves away from origin (1 mark)
(Example) Bicep Brachii downward phase of bicep curl (1 mark)
- Total 4 marks**

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(b) Shoulder Joint

- (i) Agonist muscle – deltoid (1 mark)
- (ii) Articulating Bones – (Head of) Humerus
Scapula (1 mark for each)
- (iii) Upward phase – adduction (1 mark)
Downward phase – abduction (1 mark)

Total 5 marks

I Nervous System

(i) Motor Neurone

Label	Name	Function
A	Axon	Carries the nervous impulse
B	Myelin sheath/Schwann cell	Protection/insulation of nerve
C	Nucleus	Controls the cell
D	Dendrites	'Pick up' nervous impulses
E	Cell Body/Soma	Directs the activities of the neurone
F	Motor End Plate/ neuromuscular junction	Connects the motor neurone to the muscle fibre

Only receives mark if structure correctly identified and the function is correct. (4 marks)

- (ii) Motor Unit – a motor neurone (1 mark) and its associated muscle fibres (2 marks)
- (iii) Wave summation: 3 marks for 3 of:
 - 1 Involves the frequency at which impulses arrive at the muscle fibres
 - 2 Motor unit responds to a stimulus by giving a twitch
 - 3 Period of contraction followed by relaxation
 - 4 Second impulse applied before relaxation completed
 - 5 Further contraction occurs which is stronger

Total 9 marks

(d) Venous Return: 5 marks for 5 of:

- 1 Pocket Valves – one way valves prevent backflow of blood
- 2 Muscle Pump – skeletal muscle contracts squeezing blood in veins back to heart
- 3 Respiratory Pump – breathing during exercise deeper and or faster, pressure changes in thorax abdomen. Large veins squeezed – blood back to heart
- 4 Smooth Muscle – contraction and relaxation of smooth muscle in middle of vein walls
- 5 Gravity – blood from upper body returns more quickly

Total 5 marks

(e) Vasomotor control: 2 marks for 2 of

- 1 Pre-capillary sphincters are bands of muscle surrounding the entry to the capillaries
- 2 VCC (Vasomotor control centre) stimulates the sympathetic nervous system
- 3 To vasodilate the pre-capillary sphincters, therefore increasing blood flow to muscles during exercise
- 4 To vasoconstrict the pre-capillary sphincters, therefore restricting blood flow to organs during exercise.

Total 2 marks

TOTAL FOR QUESTION: 25 MARKS

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Section B Acquisition of Skill

Question 3

(a) Perceptual Skill

(Definition) a skill which involves the detection and interpretation of information (1 mark)

(Example) in football deciding when to release a through ball to a fellow player (1 mark)

Total 2 marks

(b) Operant Conditioning: 4 marks

1 Structure the environment/feed the ball to forehand side

2 Give target area for the player (marked area cross court)

3 Player attempts skill/trial and error/practice

4 Coach ensures reinforcement/approval when correct response occurs S/R bond

5 Coach shapes behaviour of the performer

Total 4 marks

I Feedback

(i) Knowledge of results

(Explanation) external feedback given at the end of the performance/terminal feedback, providing information about the end result (1 mark)

(Example) you completed the 100 m sprint in 10.2 seconds (1 mark)

(ii) Knowledge of performance

(Explanation) information on how well the movement is executed (1 mark)

(Example) a fast start out of the blocks with good high knee action throughout the 100m sprint (1 mark)

Total 4 marks

(d) Schema Theory Recall Schema: 2 marks for 2 of:

1 Has the player experienced a similar situation or environment before (knowledge of initial conditions)

2 The player knows what to do in this situation (knowledge of response specifications)

3 Player stores information about the production of the movement

4 Player starts the movement

Recognition Schema: 2 marks for 2 of:

5 Player has acquired the correct feel or kinaesthesia

6 Player knows what the outcome should be

7 Player controls the movement

8 Player evaluates the movement

Total 4 marks

(e) Ability

(i) Innate physical or genetic characteristics that underlie all skill. (2 marks)

(ii) 3 marks for 3 of:

1 Dynamic strength

4 Co-ordination

2 Endurance

5 Speed

3 Flexibility

6 Reaction time

Total 5 marks

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- (f) Transfer
- (i) Proactive
(Explanation) a previously learned skill influences the learning of a new skill (1 mark)
(Example) over arm throw and the learning of a serve in tennis (1 mark)
- (ii) Retroactive
(Explanation) a newly learned skill influences skills already learned (1 mark)
(Example) a goalkeeper in football transfers into rugby, particularly the line-out (1 mark)
- (iii) Bilateral Transfer
(Explanation) skills can be transferred from one side of the body to another (1 mark)
(Example) right footed footballer transferring ball to his left foot (1 mark)

Total 6 marks

TOTAL FOR QUESTION: 25 MARKS

Question 4

- (a) Executive Programme: 4 marks for 4 of:
- 1 A plan of the whole skill or pattern of movement
 - 2 Plan stored in long term memory
 - 3 Initial motor programme made up of sub-routines, e.g. sprinting
 - 4 New skill learnt – long jump consists of many sub-routines
 - 5 Sprinting is a subroutine of long jump

Total 4 marks

- (b)(i) Memory: 2 marks for 2 of:
- 1 Information held for a very short time (0.25–1 second)
 - 2 Stores have a large capacity
 - 3 Filtering process/selective attention occurs here
 - 4 Irrelevant information quickly lost

(ii) Short term memory (1 mark) – 5–9.

(iii) Chunking or linking (1 mark)

(iv) Long term memory: 5 marks for 5 of:

- 1 Rehearsal/practice
- 2 Association/linking
- 3 Simplicity
- 4 Organisation
- 5 Imagery
- 6 Meaningful
- 7 Chunking
- 8 Uniqueness
- 9 Enjoyment
- 10 Positive reinforcement

Total 9 marks

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(c) Mark scheme below may be simplified in line with candidates' responses

Closed Loop Control: Level 2 – 2 marks for 2 of:

- 1 Short feedback loop passing through muscle spindles
- 2 Performer makes rapid adjustments
- 3 Adjustments made without thinking

*1 mark for:

- 4 Example – skier adjusting position continually

Level 3 – 2 marks for 2 of:

- 5 Feedback loop is longer
- 6 Information relayed back to the brain
- 7 Brain sends corrections back to working muscles
- 8 Characteristic of associative stage of learning
- 9 Skill appears jerky and ill timed

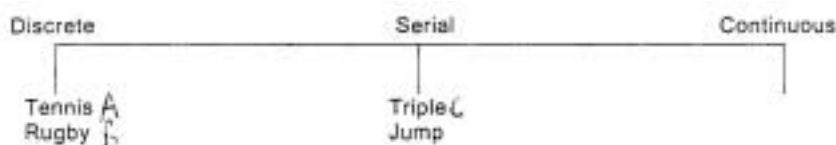
*1 mark for:

- 10 Example – individual learning badminton

Total 6 marks

(d)(i) Skill Classification: 1 mark for each:

- 1 Serve in tennis – discrete
- 2 Pass in rugby – discrete
- 3 Triple jump – serial



(ii) 1 mark for each justification:

- 1 Tennis serve – clear beginning and end/if repeated must start again
- 2 Pass in rugby – clear beginning and end/if repeated must start again
- 3 Triple jump – has a number of discrete elements put together in a definite order to make a sequence or movement

Total 6 marks

TOTAL FOR QUESTION: 25 MARKS

Question 5

(a)(i) Physical Education and Leisure: 5 marks for 5 of:

- 1 School/club links
- 2 Exam PE
- 3 Extra-curricular sport
- 4 School clubs
- 5 Understanding of rules, organisation etc.
- 6 Development of motor abilities/skills
- 7 Development of social skills
- 8 Development of self-realisation/self-esteem/confidence
- 9 Development of personal fitness
- 10 Moral development/desirable behaviour

Total 5 Marks

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(b) Outdoor Education

(i) Social Values: 4 marks for 4 of:

- 1 Development of fitness and/or health
- 2 Preparation for active leisure
- 3 Social development
- 4 Enhancement of quality of life
- 5 Development of self confidence
- 6 Appreciation of man's relationship with the environment

(ii) Subjective and Objective Danger: 4 marks for 4 of: (sub max of 2 per section)

Subjective

- 1 Under the control of the person
- 2 Becomes increasingly predictable
- 3 Becomes totally avoidable
- 4 Example: correct choice and use of equipment

Objective

- 5 The individual has no control
- 6 Becomes increasingly unpredictable
- 7 Becomes totally unavoidable
- 8 Example: Avalanche

Total 4 Marks

(c) Sport for All: 4 marks for 4 of:

- 1 National Governing Bodies
- 2 Regional Governing Bodies
- 3 Local Sports Centres/parks with courts/pools
- 4 Sports Clubs
- 5 Schools (Sport)
- 6 Youth Organisations
- 7 Special Interest Groups
- 8 Campaigns
- 9 Funding/volunteers
- 10 Competition

Total 4 marks

(d) NB Mark scheme will need revision in the light of candidates' responses.

Sports Administration: 8 marks for 8 of (look for equivalents) sub max of 4 for each section:

- 1 (Regional) County Associations
- 2 (Regional) Councils
- 3 (Regional) Centres of Excellence/appointment of coaches/selection of squads
- 4 (Regional) Coaching Centres
- 5 Government Department (Sport)
- 6 Government minister
- 7 National Sports Body
- 8 Olympic Committee
- 9 Governing Bodies
- 10 Control of funding

Or any other valid point

Total 8 marks

TOTAL FOR QUESTION: 25 MARKS

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Question 6

(a) Play: 3 marks for 3 of:

- 1 (Physical) jumping/running
- 2 (Social) co-operating with others/making friends
- 3 (Moral) being fair/not cheating/being kind
- 4 (Environmental) safety/caring for nature
- 5 (Cognitive) making up games/decision making/creative
- 6 (Health) relieve stress/ relaxation
- 7 Fun/enjoyment

Total 3 Marks

(b) Fair Play: 4 marks for 4 of:

- 1 Use of role models
- 2 Treat opponent as an equal
- 3 Abide by the rules
- 4 Respect decisions made
- 5 Shake hands end of game/cheer team off.
- 6 Good behaviour/fair play awards (external motivation)
- 7 Punish unfair behaviour/reintone fair play

Total 4 marks

(c) Characteristics of Physical Recreation
(Freedom)

- 1 Time/decided by agreement
- 2 Opportunity/available to all
- 3 Space/decided by arrangement
- 4 Choice/no extrinsic pressure
- 5 No kit/no rules/simple organisation

(Relaxation)

- 6 Recuperation/recover from stress
- 7 Recreation/chance to be creative

(Attitude)

- 8 Mental Pleasure/stimulating and exciting
- 9 Self fulfilling/personal development
- 10 Socially civilising
- 11 Physical enjoyment
- 12 Spiritual well-being
- 13 Non serious/taking part

Total 4 Marks`

(d) Sponsorship 6 marks for 6 of: (sub max of 3)

Advantages		Disadvantages	
1	Allows full time training	5	Reliant on a sponsor
2	Covers all expenses	6	Can be withdrawn
3	Provides financial security	7	Gives bad image e.g. tobacco
4	Allows person to concentrate on sport	8	Controls/ manipulates person or persons
		9	Performer feels exploited/pressure
		10	Good sponsorship only available to the best

Total 6 marks

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- (e) Media and Development of Sport: 8 marks for 8 of:
- 1 Produces positive role models
 - 2 Sports stars lose privacy
 - 3 Can create stereotypes
 - 4 Brings sport to millions of people
 - 5 Increases awareness of minority sports
 - 6 Increases participation levels
 - 7 Use of advanced technology (action replays)
 - 8 Rule changes
 - 9 Sensationalise sport
 - 10 Encourages passive spectatorism
 - 11 Media influence on timing/scheduling of games/events to coincide with peak viewing times
 - 12 Concentrates on major sports
 - 13 Sports which do not make 'good television' or would be too expensive to cover are marginalised, e.g. orienteering
 - 14 Encourages sponsorship and therefore more funding
 - 15 Too much to lose, therefore people cheat

Or any other valid point

Total 8 marks

TOTAL FOR QUESTION: 25 MARKS