

# UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

## MARK SCHEME for the June 2005 question paper

### 0413/01 PHYSICAL EDUCATION

0413/01 Paper 1 (Theory), maximum raw mark 80

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 June 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.



Grade thresholds for Syllabus 0413 (Physical Education) in the June 2005 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 1	80	57	40	21	14

The thresholds (minimum mark) for B is set halfway between those for Grades A and C.  
The thresholds (minimum mark) for D is set halfway between those for Grades C and E.  
The thresholds (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.

Grad A\* does not exist at the level of an individual component.



June 2005

IGCSE

**MARK SCHEME**

**MAXIMUM MARK: 80**

**SYLLABUS/COMPONENT: 0413/01**

**PHYSICAL EDUCATION**



Page 1	Mark Scheme	Syllabus	Paper
	IGCSE – JUNE 2005	0413	1

Question	Answers Section A	Part Mark
1	<ul style="list-style-type: none"> <li>▪ Shape and support</li> <li>▪ Movement</li> <li>▪ Protection</li> <li>▪ Blood production</li> </ul>	1
2	<ul style="list-style-type: none"> <li>▪ Enough food, clothes and shelter</li> <li>▪ Friends and support</li> <li>▪ Belief that you have some value in society (school, family, job)</li> </ul>	1
3	<ul style="list-style-type: none"> <li>▪ Slow twitch fibre</li> </ul>	1
4	<ul style="list-style-type: none"> <li>▪ Improves the ability to push and pull</li> <li>▪ Quick to do</li> <li>▪ Does not hurt</li> <li>▪ No need for expensive equipment</li> <li>▪ Can be done anywhere</li> <li>▪ Develops dynamic strength</li> <li>▪ Enables a wide range of movement</li> <li>▪ Do at anytime/anywhere</li> </ul>	1
5	<ul style="list-style-type: none"> <li>▪ Introduction of Aerobics - step Aqua</li> <li>▪ Yoga</li> <li>▪ Dance</li> <li>▪ Women only classes - gym swimming</li> </ul> <p>Activities need to be linked to women only groups to gain a mark</p>	1
6	<ul style="list-style-type: none"> <li>▪ Hearing/verbal guidance</li> <li>▪ Seeing/sight</li> <li>▪ Feeling/manual guidance</li> </ul>	2
7	<ul style="list-style-type: none"> <li>▪ Speed and reaction time</li> <li>▪ Agility</li> <li>▪ Co-ordination</li> <li>▪ Timing</li> <li>▪ Balance</li> <li>▪ Power</li> </ul>	2
8	<ul style="list-style-type: none"> <li>▪ Physical contact/collision/tackles</li> <li>▪ Over use, long term stresses - strains</li> <li>▪ Falling, twisting - sprains</li> <li>▪ Falls, sliding on the ground - friction burns, blisters</li> <li>▪ Cuts from a variety of sources</li> </ul>	2
9	<ul style="list-style-type: none"> <li>▪ Attaches the muscle to the bone</li> <li>▪ Tendons are springy and stretchy</li> <li>▪ Allows the joint to move</li> <li>▪ Tendons take the strain during movement</li> <li>▪ Releases Kinetic energy</li> </ul>	2

<b>Page 2</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – JUNE 2005</b>	<b>0413</b>	<b>1</b>

<b>10</b>	<ul style="list-style-type: none"> <li>▪ Frequency</li> <li>▪ Intensity</li> <li>▪ Time</li> <li>▪ Type</li> <li>▪ Specificity</li> <li>▪ Overload</li> <li>▪ Progression</li> <li>▪ Reversibility</li> </ul>	<b>2</b>
<b>11</b>	<p>In a rural Area:</p> <ul style="list-style-type: none"> <li>▪ May use natural features i.e. lakes etc.</li> <li>▪ Multi purpose facilities</li> <li>▪ Population distribution maybe less, therefore, maybe smaller facilities are built</li> <li>▪ Fewer low profit facilities, i.e. swimming pools</li> <li>▪ Activities that require more space i.e. golf courses will be situated</li> </ul> <p>In an Urban area:</p> <ul style="list-style-type: none"> <li>▪ Sports centres may offer specialist provision</li> <li>▪ Certain sports specific to the urban areas i.e. basketball</li> <li>▪ Finance and government initiatives are often targeted at urban area</li> <li>▪ Use of artificial facilities to i.e. climbing walls</li> <li>▪ Adaptation of certain activities i.e. use of a driving range because not enough space for a golf course</li> </ul>	<b>2</b>
<b>12</b>	<ul style="list-style-type: none"> <li>▪ Timing of presentation</li> <li>▪ Level of advertising/promotion before the event</li> <li>▪ Use of high profile presenters</li> <li>▪ Time of event - peak viewing time</li> <li>▪ Channel being used</li> <li>▪ Fly on the wall documentary to support programme</li> <li>▪ Changes to the rules/presentation to appeal more to viewers</li> <li>▪ Use of camera angles to create high levels of interest and excitement</li> <li>▪ On screen statistics</li> <li>▪ Analysis of event</li> <li>▪ Interactive viewing</li> </ul> <p>Negative responses will also be rewarded:</p> <ul style="list-style-type: none"> <li>▪ If not covered could loose popularity</li> <li>▪ Over exposure could reduce popularity</li> <li>▪ Coverage of unimportant games could reduce interest</li> </ul>	<b>3</b>
<b>Total mark 20</b>		

Page 3	Mark Scheme	Syllabus	Paper
	IGCSE – JUNE 2005	0413	1

Question	Answers Unit 1	Part mark
(a)	Adrenalin will result in: <ul style="list-style-type: none"> <li>▪ Dry mouth</li> <li>▪ Faster breathing</li> <li>▪ Increase in heart rate</li> <li>▪ Sick feeling in the stomach</li> <li>▪ Sweaty palms</li> <li>▪ Feeling nervous/shaky feeling</li> </ul>	1
(b)	<ul style="list-style-type: none"> <li>▪ The heart rate reaches maximum</li> <li>▪ The heart rate meets the demands of the exercise</li> </ul>	2
(c)	<ul style="list-style-type: none"> <li>▪ Physically Tom may not be able to cope in contact/power sports</li> <li>▪ Stress - gets concerned about results</li> <li>▪ Coach/parents place him under pressure to do well</li> <li>▪ Arousal levels - may become too aggressive</li> <li>▪ Becomes nervous</li> <li>▪ Gets too psyched up</li> <li>▪ Preparation on the day is ineffective</li> <li>▪ Over-train in practice</li> <li>▪ Peaked too early</li> </ul>	2
(d)	<ul style="list-style-type: none"> <li>▪ Shoulder and hip - ball and socket</li> <li>▪ Knee and elbow - hinge</li> <li>▪ Between carpals and tarsal - gliding</li> <li>▪ Neck - pivot</li> <li>▪ Thumb - saddle</li> <li>▪ Wrist - condyloid</li> </ul> <p>Candidates must name a location and type of joint for 1 mark</p>	1
	(ii) Synovial membrane: <ul style="list-style-type: none"> <li>▪ Produces synovial fluid</li> <li>▪ Forms a lining in the capsule</li> <li>▪ Prevents leakage of synovial fluid</li> </ul>	1
	(iii) Synovial Fluid <ul style="list-style-type: none"> <li>▪ Lubricates the joint</li> <li>▪ Allows easy movement</li> </ul>	1
(e)	(i) Increase in the number of alveoli in the lungs Increased vital capacity <ul style="list-style-type: none"> <li>▪ An increase in the maximum total volume of air that can be breathed in and out in a single breath</li> <li>▪ Increase in the amount of oxygen</li> <li>▪ Increase in the amount of carbon dioxide that can be expelled</li> <li>▪ Increase in the amount of oxygenated blood</li> <li>▪ Delay in the build up of lactic acid</li> </ul>	

<b>Page 4</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – JUNE 2005</b>	<b>0413</b>	<b>1</b>

<b>(f)</b>	<p>Tidal Volume:</p> <ul style="list-style-type: none"> <li>▪ Amount of air entering and leaving the lung</li> <li>▪ Increase in tidal volume linked to increase in vital capacity</li> <li>▪ Allows muscle to work harder</li> <li>▪ Increase in the oxygen carrying capacity</li> </ul> <p>Oxygen Debt tolerance</p> <ul style="list-style-type: none"> <li>▪ Body able to perform for longer</li> <li>▪ Able to maintain level of performance for longer</li> <li>▪ Ability to recover quickly</li> </ul> <p>Minute Volume</p> <ul style="list-style-type: none"> <li>▪ Increase in the amount of oxygen that you breathe in per minute</li> </ul> <p><b>(ii)</b> Develop profiles of elite performer</p> <ul style="list-style-type: none"> <li>▪ Provide information that may affect the level of performance</li> <li>▪ Assess the effectiveness of training methods</li> <li>▪ Allows adjustments in training methods to be monitored</li> <li>▪ Highlight areas of weakness</li> <li>▪ Allows the physiological potential of the athlete to be assessed</li> <li>▪ Assess progress after illness, injury</li> <li>▪ Compare tests with other performers of the same level of ability</li> </ul> <p>Programme should be built around progression Testing before any training takes place (max 1 mark)</p> <p>Phase 1 - out of season/early season</p> <ul style="list-style-type: none"> <li>▪ General fitness, mainly aerobic</li> <li>▪ Strength, mobility and endurance training at a low level</li> <li>▪ Basic technique/skills work</li> <li>▪ Healthy diet</li> </ul> <p>Phase 2</p> <ul style="list-style-type: none"> <li>▪ Fitness becomes more specific - aerobic</li> <li>▪ Technical skills become more advanced</li> </ul> <p>As the competition gets closer low key competition with feedback on fitness and technical progress</p> <p>Phase 3</p> <ul style="list-style-type: none"> <li>▪ Early season low level competition</li> <li>▪ Increase in intensity of training</li> </ul> <p>Phase 4</p> <ul style="list-style-type: none"> <li>▪ Work on technique with feedback</li> <li>▪ Adjustments to training both technical and physical based on feedback</li> </ul>	<p><b>3</b></p> <p><b>2</b></p>
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<b>Page 5</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – JUNE 2005</b>	<b>0413</b>	<b>1</b>

	<p>Phase 5</p> <ul style="list-style-type: none"> <li>▪ Higher levels of competition</li> <li>▪ Maintain fitness work</li> <li>▪ Fine adjustments to technique</li> <li>▪ Care to rest well prior to championships</li> <li>▪ Adjustments to diet - carbo loading</li> <li>▪ Travel to event might include a period of acclimatisation</li> </ul> <p>After championships/event</p> <p>Phase 6</p> <ul style="list-style-type: none"> <li>▪ Recovery and recuperation</li> <li>▪ Use other forms of physical activity to maintain a level of fitness</li> <li>▪ Planning for future events</li> </ul> <p>If a general description of how progression in training brings about improvement over time - 1 mark  If an example is used to illustrate answer - 1 mark</p>	<p><b>7</b></p> <p><b>Total mark 20</b></p>
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Page 6	Mark Scheme	Syllabus	Paper
	IGCSE – JUNE 2005	0413	1

Question	Answers Unit 2	Part mark
(a)	Protein	1
(b)	<p>Answer should not relate to the role of the coach, parent, referee, rules of the game etc; but to the participant themselves. The answer should also concern itself with what happens during the event and not prior, therefore, a warm up should not be seen as a correct response.</p> <p>No mark for the activity - but it must be named to gain any marks.</p> <ul style="list-style-type: none"> <li>▪ Wear correct footwear</li> <li>▪ Safety equipment - mouth guard</li> <li>▪ Protective equipment - unless the rules state that it must be worn i.e. shin pads in football</li> <li>▪ Keep fingernails short</li> <li>▪ Do not attempt complex skills not prepared for</li> <li>▪ Do not play when injured or not fully recovered from injury</li> <li>▪ Only play within age/weight/ability group</li> <li>▪ Weather if related to safety in the named activity i.e. sailing, hill walking</li> </ul>	2
(c)	<ul style="list-style-type: none"> <li>▪ Muscles feel tired</li> <li>▪ Muscles become painful</li> <li>▪ If you don't stop you will collapse</li> <li>▪ Develop cramp</li> <li>▪ Muscle contractions become difficult</li> <li>▪ Muscles begin to 'burn'</li> <li>▪ Muscles stop working</li> </ul>	2
(d)	<p>If the answer is related to any sprinting activity i.e. athletics, swimming, cycling credit should be given if answers relate to an activity</p> <p>One mark awarded for naming a training method</p> <p>Interval Training</p> <ul style="list-style-type: none"> <li>▪ This has a fixed pattern of fast and slow work</li> <li>▪ It can be applied to running and swimming</li> <li>▪ Overload is easy to achieve - by doing more reps or sets or both</li> <li>▪ You can mix aerobic and anaerobic work</li> <li>▪ It is easy to see improvement</li> </ul> <p>Fartlek Training</p> <ul style="list-style-type: none"> <li>▪ Training is based on changes of speed</li> <li>▪ Can be used for a range of activities</li> <li>▪ Maintains interest by the changes</li> <li>▪ Easy to adapt for any sport</li> <li>▪ Easy to increase overload</li> </ul> <p>Other examples such as pyramid training, resistance training and plyometric should be rewarded with appropriate description</p>	3

Page 7	Mark Scheme	Syllabus	Paper
	IGCSE – JUNE 2005	0413	1

<b>(e)</b>	<p>Long term exercise will:</p> <p><b>(i)</b> Increases stroke volume - the amount of blood that can be pumped around the body - more oxygen can be delivered to the muscles - results in improved performance, particularly in endurance events</p> <p>Increased cardiac output - the amount of blood pumped out of the heart in one minute - cardiac output = stroke volume x beats per minute</p> <p>Lower resting heart rate - the heart has to work less hard to achieve the same results - increase in the volume of blood per beat</p> <p><b>(ii)</b> Use the heart rate to measure: Lower resting heart rate, works less hard to achieve the same results, heart normally beats between 60 - 80 beats per minute, people who exercise usually beat between 50 - 60, extreme example have recorded heart rate of about 40 beats</p> <p>Speed of recovery will cause the heart rate recover quicker to resting heart rate, the quicker the recovery indicates a more efficient circulatory system</p> <p><b>(iii)</b> The calculation for a 15 year old would be to subtract age from 220 = 205 (MHR)</p> <ul style="list-style-type: none"> <li>▪ <b>(iv)</b> using the above calculation estimate 60- 80% of MHR</li> <li>▪ Working heart rate should be between 123- 164</li> <li>▪ At this intensity the training energy would be supplied aerobically</li> <li>▪ Slow twitch fibres will be able to provide the energy</li> <li>▪ Working at this level will enable the build up of the circulatory system</li> <li>▪ Working at this level will enable the build up of the respiratory system</li> <li>▪ Intensity allows strengthening of ligaments and tendons</li> </ul> <p>The answers must relate to anaerobic and aerobic respiration</p>	<p><b>1</b></p> <p><b>1</b></p> <p><b>1</b></p> <p><b>2</b></p>
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Page 8	Mark Scheme	Syllabus	Paper
	IGCSE – JUNE 2005	0413	1

(f)	<ul style="list-style-type: none"> <li>▪ (i) Anaerobic activities are explosive, do not use oxygen, last for a short period of time, require intense effort for a short period of time. Cannot be sustained for more than 40 seconds</li> <li>▪ Aerobic activities are endurance based, activities that take place over a long period of time, operate at a slower pace, use oxygen throughout performance.</li> </ul> <p>One mark for each description- credit to be given if accurate examples are given</p> <ul style="list-style-type: none"> <li>▪ Anaerobic- sprinting, weight lifting, throwing activities</li> <li>▪ Aerobic- long distance running, swimming</li> </ul> <p>(ii) Candidates must give information relating to both energy systems to gain maximum marks although marks can be awarded for the effects common to both systems.</p> <p>Common to both systems:</p> <ul style="list-style-type: none"> <li>▪ Energy is required for muscle contraction</li> <li>▪ Energy is supplied by Adenosine Triphosphate (ATP) when glucose is broken down</li> <li>▪ When ATP is produced pyruvic acid is formed</li> <li>▪ ATP is broken down to Adenosine Diphosphate (ADP)</li> <li>▪ Supplies of ADP in the muscle are very small</li> </ul> <p>Anaerobic:</p> <ul style="list-style-type: none"> <li>▪ Oxygen cannot reach the muscles fast enough</li> <li>▪ Glucose produces energy without oxygen being present</li> <li>▪ Less energy is produced using the same amount of glucose</li> <li>▪ Therefore lasts for shorter periods</li> <li>▪ Energy is produced much faster</li> <li>▪ After a minute or so lactic acid is produced</li> <li>▪ Creatine phosphate which is stored in the muscle can be used for muscle contraction even in the absence of oxygen but only lasts for 30 - 60 seconds</li> <li>▪ Alternative energy sources are needed for continued muscle contraction</li> <li>▪ When insufficient oxygen is present pyruvic acid is converted into lactic acid</li> <li>▪ When oxygen becomes available lactic acid will be converted back into pyruvic acid which in turn converts back to carbon dioxide and water</li> <li>▪ Oxygen debt will form</li> </ul> <p>Aerobic:</p> <ul style="list-style-type: none"> <li>▪ Muscles depend on aerobic respiration for the majority of time</li> <li>▪ Glucose continues with oxygen</li> <li>▪ Energy produced is used for muscular contraction and heat which warms the body</li> <li>▪ Water is carried away by blood , the lungs and urine</li> </ul>	2
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<b>Page 9</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Paper</b>
	<b>IGCSE – JUNE 2005</b>	<b>0413</b>	<b>1</b>

	<ul style="list-style-type: none"> <li>▪ Carbon dioxide is carried away by blood and excreted through the lungs</li> <li>▪ Production of ATP is much more efficient when done so with oxygen</li> <li>▪ The system is able to use stored fat as a source of energy rather than carbohydrates</li> <li>▪ Allows a greater amount of fuel to be released from carbohydrates without the build up of lactic acid</li> </ul> <p>If candidates produce diagrams to illustrate their answers a maximum of one mark can be awarded unless there is a description included.</p>	<p><b>2/3</b> <b>3/2</b></p> <p><b>Total marks 20</b></p>
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Page 10	Mark Scheme	Syllabus	Paper
	IGCSE – JUNE 2005	0413	1

Question	Answers Unit 3	Part mark
(a)	<ul style="list-style-type: none"> <li>▪ People live longer so have more opportunity for participation</li> <li>▪ Improved medicines speed recovery</li> <li>▪ Better identification of medical problems</li> <li>▪ Better medical care</li> <li>▪ People are more aware of medical issues</li> <li>▪ Better quality of after care</li> <li>▪ Opportunities for private medical care provides greater opportunities for speedier responses</li> </ul>	1
(b)	<p>Organisations:</p> <ul style="list-style-type: none"> <li>▪ Youth clubs, scouts, guides</li> <li>▪ Church groups</li> <li>▪ Charitable organisations - National Trust, YHA</li> <li>▪ Community groups</li> </ul> <p>Reasons:</p> <ul style="list-style-type: none"> <li>▪ Aware of local needs</li> <li>▪ This could include</li> <li>▪ Social needs of area</li> <li>▪ Allowing minority groups to participate in activities that reflect their cultural/religious needs</li> <li>▪ Profit is not an issue</li> </ul>	2
(c)	<ul style="list-style-type: none"> <li>▪ Maintain a healthy lifestyle</li> <li>▪ Enjoyment</li> <li>▪ Gain satisfaction from participation</li> <li>▪ Socialise - meet friends/new people</li> <li>▪ Relaxation - reduce stress</li> <li>▪ As a job</li> <li>▪ Hobby</li> <li>▪ Sense of adventure, challenge</li> <li>▪</li> </ul>	2
(d)	<p>(i) Scholarship or trust funds</p> <p>(ii) Scholarship</p> <ul style="list-style-type: none"> <li>▪ Can access university/higher education and use top quality facilities and coaching</li> <li>▪ Can continue with his/her education</li> <li>▪ Funding will be met by university/college</li> <li>▪ Has academic background at the end of participation</li> <li>▪ Can access those sports that are still regarded as amateur</li> </ul> <p>Trust Fund</p> <ul style="list-style-type: none"> <li>▪ Can receive prize money and sponsorship, these to be kept in a trust fund</li> <li>▪ Financial support for training, competition, equipment from trust fund</li> <li>▪ On retirement balance of trust fund available which for top performers can be considerable</li> </ul>	1

Page 11	Mark Scheme	Syllabus	Paper
	IGCSE – JUNE 2005	0413	1

(e)	<ul style="list-style-type: none"> <li>▪ Can access those sports still regarded as amateur</li> </ul>	<b>2</b>
	<ul style="list-style-type: none"> <li>▪ Involvement with a professional club</li> <li>▪ Opportunity to access high quality coaching</li> <li>▪ Opportunities to join high quality coaching/training groups</li> <li>▪ To have the back up from technical support</li> <li>▪ To have the back up from medical support when needed</li> <li>▪ Able to access a sports academy</li> <li>▪ Ability to access and use high quality training facilities</li> <li>▪ To have financial support from either parents, trust funds, sponsors etc</li> <li>▪ To have access to transport</li> <li>▪ To be able to take part in competitions that are relative to their ability</li> <li>▪ To have the backing of their sports governing body</li> </ul>	<b>5</b>
(f)	<p>(i) The secretary - arranges meetings, keeps minutes, main source of communicating to members.</p> <ul style="list-style-type: none"> <li>▪ Treasurer- looks after finances</li> <li>▪ Chair - person - represents the club at key meetings</li> <li>▪ Vice chair - deputises for the chair - person</li> <li>▪ Fixtures secretary - arranges events</li> <li>▪ Membership secretary - enrol new members</li> </ul>	<b>2</b>
	<p>(ii) The club would raise money by:</p> <ul style="list-style-type: none"> <li>▪ Membership fees, match fees, court fees</li> <li>▪ Grants from local authorities, governing body, lottery funding</li> <li>▪ Sponsorship</li> <li>▪ Fund raising, raffles</li> </ul> <p>A large professional company would raise money by:</p> <ul style="list-style-type: none"> <li>▪ Charging admission, tickets etc.</li> <li>▪ PLC companies via the stock exchange</li> <li>▪ Merchandising</li> <li>▪ Loans from banks etc.</li> </ul>	<b>4</b>
	<p>(iii) Provide facilities</p> <ul style="list-style-type: none"> <li>▪ Organise competition</li> <li>▪ Promote the sport</li> <li>▪ Encourage new membership</li> <li>▪ Develop youth sections within the club</li> <li>▪ Look for links/developments with schools</li> </ul>	<b>1</b>
	<b>Total 20 marks</b>	