



**Cambridge International Examinations**  
Cambridge International General Certificate of Secondary Education

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**PHYSICAL EDUCATION**

**0413/13**

Paper 1

**October/November 2016**

MARK SCHEME

Maximum Mark: 80

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**Published**

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1	the skull / cranium / pelvis / joins the radius and ulna / joins the tibia and fibula;	1

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2	prevents losing focus on the activity; prevents becoming over-aggressive; prevents decision-making becoming affected;	1

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
3	encourage participation; promote the sport; organise competition; provide facilities / equipment; raise standards / provide coaching; maintain financial stability within the club / find sources of funding / sponsorship;	1

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
4	input / decision-making / output / feedback;	1

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
5	can be used as an energy source; provides insulation; essential fatty acids; enables the body to store, transport and absorb fat-soluble vitamins (A, D, E, K);	1

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
6	access to high-quality facilities / equipment; access to high-quality coaching / playing opportunities; able to continue studying; no financial worries / provided with accommodation / pay travel costs / school fees paid;	1

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
7	bicep; tricep;	2

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
8	unable to complete activity; signs of illness / colds; movement at joints painful / limping; taking longer to recover from a training session than usual / tired; poor muscle movement due to soreness / often having minor injuries; lack of motivation / not turning up to training; depressed / unhappy / lacking confidence; changes in personality / aggressive / withdrawn; showing little progress / performs poorly;	2

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
9	raise / promotes the company's image; provides a positive link to a community; sponsorship can be tax deductible; provides high levels of publicity / advertisements / inexpensive advertising; the event can be used as a corporate event for the sponsor's customers; if the event is successful the company will also be seen as successful; if successful the company's business will improve;	3

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
10	lesson / activity is at an appropriate level for students; correct clothing and footwear is worn; safety equipment available; students have the correct technique; students understand safety procedures; students understand any lifting / carrying / placing of equipment techniques; students understand rules / codes / laws of the game; ensure a warm up / cool down is completed / first-aid kit available; environmental check of the area where the lesson is planned to take place / equipment is safe and appropriate;	3

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Question	Answer		Marks
11	<b>Drug</b>	<b>Long term effect</b>	4
	Stimulants	High blood pressure. Liver and brain damage.	
	Narcotic analgesics	<b>constipation / low blood pressure / addictive / suppression of pain causes further injury;</b>	
	Diuretics	<b>the body excretes essential salts / muscle weakness / heart damage / severe weight loss;</b>	
	Anabolic steroids	<b>heart damage / low blood pressure / weakened ligaments and tendons / infertility / cancer / aggressive behaviour / changes in sexual characteristics;</b>	
	Tranquillisers	<b>feeling of dullness / lack of energy / addictive;</b>	

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Question	Answer	Marks
12(a)	closed skill – e.g. front crawl / forward roll; open skill – e.g. saving a goal in football or hockey / volleyball spike;	2
12(b)	ligament – holds bone together to form the joint; joint capsule – helps to hold the joint in place / protects the joint; synovial membrane – lining of the capsule that produces synovial fluid; synovial fluid – the fluid that fills the cavity and allows smooth movement; joint cavity – creates a gap, this fills with synovial fluid that allows the joint to be lubricated and creates a smooth movement; cartilage – prevents the bones from knocking together;	3
12(c)	fast-twitch fibre: fast powerful contractions / able to move limbs quickly, such as when sprinting; gets tired easily / cannot sustain all-out effort for long periods and the athlete will have to stop all-out effort after a few seconds; lactic acid builds quickly / slows the athlete down / causing muscle pain; allows bursts of power / can accelerate quickly; low levels of oxygen / go into anaerobic respiration quicker;  <b>OR</b>  slow-twitch fibre: contracts slowly / better for long-distance activities; do not tire easily / able to work for long periods of time; able to sustain contractions over a period of time / less power in each contraction; high levels of oxygen in muscle fibre / pink in colour; more efficient use of oxygen and production of ATP / slows down the production of lactic acid;	3

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
12(d)	<p><i>Maximum of 2 marks from either part.</i></p> <p>process:  EPO is injected into the athlete, it contains synthetic chemicals that can carry an increased amount of oxygen;  blood transfusions, blood is withdrawn and the plasma re-infused, red blood cells are frozen to reduce the aging process, the blood cells are re-infused before the athlete needs to perform;</p> <p>effect:  increases the number of red blood cells;  reduces fatigue;  increases the supply of oxygen to the muscles;  enables the performer to work for longer;</p>	<b>3</b>

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Question	Answer	Marks
12(e)	<p><i>Maximum of 2 marks from either part.</i></p> <p>short term:  increase in respiratory rate;  the breathing rate increases as the body requires more oxygen and needs to remove more carbon dioxide;  increase in tidal volume;  the amount of oxygen inhaled in one breath increases as does the amount of carbon dioxide exhaled;  increase in the rate of gas exchange;  the exchange of oxygen and carbon dioxide increases between the alveoli and capillaries, which ensures a supply of oxygen into the blood;</p> <p>long term:  strengthening of the respiratory muscles;  the respiratory muscles, diaphragm and the intercostal muscles strengthen as they work harder in inhalation and exhalation / the chest cavity becomes larger;  increase in respiratory volume / lung capacity;  the volume of air inhaled / exhaled and stored in the lung increases / the volume of oxygen diffused in the cells increases;  greater efficiency of gas exchange;  regular exercise increases the number of capillaries that surround the alveoli / it also makes the capillaries dilate more to make exchange more efficient;  improves lung efficiency;  lungs become more efficient by facilitating the transport of oxygen to the cells of the body, blood flow also increases;</p>	4



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Question	Answer	Marks
12(f)	<p><i>Descriptions of tests should indicate the main features. Alternative recognised tests can be given credit.</i></p> <p><i>Examples may include:</i></p> <p>cardio-vascular endurance – 12-minute Cooper run – requires a measured flat track, stop watch and recording the distance covered. The athlete runs for 12 minutes covering the greatest distance possible. Calculate the distance covered and apply to standardised scores;</p> <p>body composition – skin fold test – requires skin fold callipers and tape measure, measurements are taken from 3–9 sites on the body, the right side of the body is usually used, tester pinches a fold of skin but not muscle, callipers are applied 1 cm below the skin fold at right angles, reading is taken 2 seconds later, take 2 measurements and score the average of the two measurements;</p> <p>flexibility – sit and reach test – legs must be fully extended with soles of the feet flat against a bench, subject should stretch forwards as far as possible, measure from the tip of the finger beyond the line of the toes;</p> <p>muscle endurance – press up / sit up test – e.g. sit up must be done with bent knees, place hands on opposite shoulders, count the number of completed sit ups in 1 minute;</p> <p>speed – flying 30 m sprint test – measure 30 m distance, athlete starts to sprint and sprints past the start marker and sprints past the 30 m mark, time is taken;</p> <p>stamina – multi-stage fitness test, tape or CD required, lines marked 20 m apart, participants must run from one line to the other before the bleep, participants drop out if they fail to beat the bleeps on 1/2 occasions, levels are recorded;</p> <p>strength – hand grip strength test – candidates grip the dynamometer with the arm at right angles, dynamometer rests on the heel of the palm, when ready the candidate squeezes the handle as hard as possible, maintain the effort for 5 seconds;</p>	4

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Question	Answer	Marks
12(g)(i)	<p><i>Accept any valid target with suitable activity.</i></p> <p><i>example:</i></p> <p>activity: basketball;</p> <p>target: improve rebounding – increase the number of rebounds by 20% in a game by the end of the season;</p> <p><i>The target should be specific to the named sport, have a time limit and be measurable.</i></p>	1

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Question	Answer	Marks
12(g)(ii)	<p><i>Examples here are for basketball:</i></p> <p>specific – training should be focused on positioning to rebound / power training to improve the ability to jump / strength training to maintain the position when jumping to avoid the ball being knocked out of their hands;</p> <p>measurable – in a game situation count the number of rebounds that are taken;</p> <p>agreed – agree with the coach the number of rebounds to aim for based on the number taken before training started;</p> <p>realistic – do not expect the player to rebound all balls / set a target that reflects the amount of court time / ensure that the player plays in a position where they are most likely to rebound;</p> <p>time-phased – aim to achieve the target half-way through the season;</p> <p>exciting – training should not be based just on rebounding / include in a training session shooting, footwork, passing etc.;</p> <p>recorded – throughout the season keep a record of the number of rebounds achieved in training / record the number of rebounds in a game / compare results over a season to see progress;</p> <p><i>Also allow these general points:</i></p> <p>motivates a performer to work harder;</p> <p>ensures that boredom does not set in as the performer will be working towards a time limit;</p> <p>smaller targets can be set to allow big targets to be broken down when complex skills are being learnt;</p> <p>enables weakness to be worked on and training adapted;</p> <p>when a target is achieved the performer has a sense of achievement / gives confidence to continue working;</p> <p>the goal creates a point of reference for training;</p> <p>reduces anxiety as the performer knows what he is trying to achieve;</p> <p>helps when planning training / gives focus for training / ensures time not wasted;</p> <p>allows progress to be measured to recording results;</p> <p>will know when ready to perform by being able to compare results to previous performances or others;</p> <p>provide mental preparation;</p> <p>by agreeing targets with a coach the performer will not feel isolated and be supported;</p>	5

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
13(a)	develop team work / able to work with others; improves communication skills; meet new people / make friends / increase social skills; increases confidence;	<b>2</b>
13(b)	require energy to grow / not yet matured; metabolism is generally higher; physical activities that they do are usually more demanding; may sleep less; larger body size;	<b>2</b>
13(c)	<i>Examples can include:</i> studded footwear / boots in rugby or football prevents slipping; gymnastic shoes are soft to allow the performer to feel the apparatus and prevent falling; basketball boots provide ankle support and avoid twisting; climbing boots provide the leverage / support to prevent slipping from rocks; ski boots keep the foot / ankle in a stable position to prevent the skier falling;	<b>3</b>
13(d)	level of severity of the terrain, e.g. the difficulty of the ski run / difficulty of the climbing pitch; access to the area / proximity to roads / ski lifts; expected weather conditions at that time of the year; exit routes from the mountain established / mobile phone / maps / first-aid kit available; appropriate clothing for cold conditions; equipment needed to meet the conditions / level of difficulty / appropriate for size, e.g. ski length / age; level of ability of the group to meet the demands of the conditions / suitability of group to cope with conditions; level of coaching / instruction to ensure safety and progress in the conditions / size of group; groupings of skiers to prevent skiers being isolated;	<b>4</b>

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13(e)	<p>benefits:</p> <p>the group can motivate each other to work hard / provide competition;</p> <p>the variety of stations can meet the needs of the whole group;</p> <p>time spent at each station can be easily adjusted to meet the demands of the individuals;</p> <p>participants need little information / limited coach input once the circuit has started;</p> <p>a number of people can improve their fitness;</p> <p>if space is limited can be done outdoors;</p> <p>negative effects:</p> <p>large numbers will need a number of stations so require a great deal of space and equipment / lack of space limits types of stations / great deal of planning needed;</p> <p>performers may be at different levels of fitness so it may be difficult for the circuit to stretch all participants;</p> <p>stage training needs to be done / only use the same times or number of repetitions or participants will move onto the next station at different times, which can be difficult with a large group;</p> <p>difficult to monitor / record results with large numbers of participants;</p> <p>potential for participants not to push themselves / easily distracted;</p>	<b>4</b>

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13(f)	<p><i>Maximum of 2 marks from each part.</i></p> <p>first part of the race:  start of the race causes the athlete to use anaerobic respiration / to obtain a good position in the race;  a high level of explosive energy is required for a very short period of time;  the athlete develops a small amount of oxygen debt;</p> <p>middle part of the race:  the oxygen debt is paid back with steady, controlled breathing;  the athlete uses their aerobic system in this stage of the race;  oxygen reaches the muscles to provide the required amount of energy;  lactic acid slowly increases in the muscle as fatigue begins to set in;</p> <p>final part of the race:  oxygen cannot be supplied quickly enough to provide energy in the final sprint;  breathing becomes deeper;  anaerobic respiration is used;  this speed can only last for a limited time;  lactic acid builds up quickly in muscles / muscles tire quickly / oxygen debt occurs;</p>	5

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
14(a)	<p>may not have enough money to play sports that require expensive equipment;</p> <p>the level of parental support/level of interest in a particular sport in a family/peer support;</p> <p>where a young person lives in relation to the facilities for a particular sport;</p> <p>the transport available from parents/friends;</p> <p>opportunities provided by school;</p>	<b>2</b>
14(b)	<p>access to high-quality coaching/elite coaching groups;</p> <p>access to high-quality facilities/centres of excellence;</p> <p>funds to be able to travel and compete in high-quality competition;</p> <p>access to medical support/identification of any medical problems/good rehabilitation following injury;</p> <p>support to ensure correct diet;</p> <p>social/family support;</p> <p>natural ability;</p> <p>commitment to train;</p>	<b>3</b>
14(c)	<p>there has been an increase in interest in sports/sport has become more fashionable/greater demand;</p> <p>exposure of minority sports has created greater levels of interest;</p> <p>sports from around the world can be shown easily due to improvements in technology;</p> <p>television companies can make significant amounts of money from subscription/advertisements/sponsorship;</p> <p>increases in technology has made some sports more attractive for coverage;</p> <p>increase in the amount of sport played worldwide;</p>	<b>4</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
14(d)	<p>improvements to access / ramps / automatic doors / wide doors / car parking spaces near entrances etc.;</p> <p>changing rooms on the ground floor or lifts to higher levels;</p> <p>changing areas / shower areas easy access;</p> <p>range of sports sessions available / competitions available;</p> <p>specialist coaching available;</p> <p>support available for specific sports sessions for performers with disabilities;</p> <p>adaption of equipment to make more sports available;</p> <p>specialist equipment, such as hoists for easy access to swimming pools;</p> <p>links with special schools to encourage participation / advertisement of facilities and activities;</p>	<b>6</b>