Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICAL EDUCATION **0413/13**

Paper 1 Theory **May/June 2019**

MARK SCHEME

Maximum Mark: 100

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.

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Note that candidates may only use physical activities listed in the syllabus as examples in their answers to Paper 1.

Question	Answer	Marks
1	*Any 2 of:* fixed / immovable / fibrous joints; slightly movable / cartilaginous joints; freely movable / synovial joints; *Accept ball and socket, hinge and other joint types.*	**2**

Question	Answer	Marks
2(a)	*1 mark for each of:* *A*: foundation level; *B*: performance level;	**2**

Question	Answer	Marks
2(b)	*1 mark for a description of each characteristic.* *Max. 3 characteristics from each level.* *elite level:* high performance level; represent their country in national and international competition; most will be professional performers; train full time; access training groups / best-quality coaches; national training camps; sports-science / medical / diet support; attend advanced training camps, e.g. warm-weather training camps / altitude training; access to high-quality equipment / equipment made or adapted specifically for a performer; financial support will be available / usually sponsored; usually use intrinsic feedback; *participation level:* ref. to sound / eq. level of performance; may attend local classes / may attend physical education lessons; may join local clubs / may attend extra-curricular clubs; chooses to do activity in leisure time / as a hobby / may go on activity holidays etc.; participate for enjoyment / friendship; participate for health / fitness; often reliant on extrinsic feedback;	**6**

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Question	Answer	Marks
2(c)	*1 mark for each strategy*. for example: campaigns to encourage students to try sports / involvement with national campaigns etc.; links with local sports centres; encourage participation through award schemes; visits to major sporting events; provide equipment to introduce sports to school / provide facilities; provide extra-curricular clubs; encourage family support for children; external publicity through school websites / newsletters etc.; internal use of notice boards / posters to publicise events in school; bring outside coaches / speakers into school; offer a range of examination courses that provide extra opportunities to participate; provide teams / competitions / competitive matches; provide scholarships;	**2**

Question	Answer	Marks
3	*1 mark for each description.* *Any 2 of:* essential human needs are met; friendship and support; having value within society; ability to mix with others;	**2**

Question	Answer	Marks

4(a)	*1 mark for each muscle named.*
	1 mark for the description.
	
	agonist:
	hamstring(s) (group);
	
	antagonist:
	quadricep(s) (group);
	
	description:
	the hamstrings contract / shorten and pull on the lower leg to bring it up **AND** the quadriceps relax / lengthen (to allow the movement to take place);
		3

4(b)(i)	*Any 1 of:* join / connect muscles to bone; pull on bones when muscles contract; withstand tension when a muscle contracts;	**1**
4(b)(ii)	*1 mark for each cause.* for example: too much stress on the tendon; overstretching; sudden change in use; overuse / repetitive strain; poor technique; twisting movements; *Allow sports-specific causes.*	**2**
4(b)(iii)	*Reasons must be different. 1 mark for a reason for the use of each component.* *ice*: reduce swelling / reduce pain / reduce blood flow to the injured area; *compression*: support the injured area / immobilise / reduce blood flow / reduce swelling / provide pressure to secure ice pack;	**2**

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Question	Answer	Marks
5(a)	*1 mark for each substance.* *A*: oxygen; *B*: carbon dioxide;	**2**
5(b)	*1 mark for how glucose is stored in the body.* *1 mark for where glucose is stored in the body.* for example: *how:* 1 of: as glycogen; (excess glucose is stored) as fat; *where:* 1 of: muscles; liver;	**2**
5(c)	*1 mark for each description.* for example: in track and field athletics: in a distance race an athlete will be running at a steady pace using aerobic respiration but sprint in the final stages of the race using anaerobic respiration; in basketball: the player is moving at a steady pace whilst defending as part of a team defence using aerobic respiration but when the ball is won the player sprints down the court as part of a fast break using anaerobic respiration; in football: a player moves into the opposition penalty area as the ball is crossed, as this is slow it is aerobic but they jump to head the ball, the jump would be an all-out effort, which would be anaerobic respiration; *Do not accept the same situation in different activities, e.g. running past an opponent in football, hockey, rugby etc.;* *Accept other examples.*	**2**

Question	Answer	Marks
6(a)	*1 mark for y-axis scale completed.* *1 mark for all bars completed accurately.* *1 mark for x-axis activities labelled.*	**3**
6(b)	*1 mark for each advantage.* for example: increases chance of sponsorship; increases public awareness of the individual / exposure / fame / creates role models; increases awareness of national selectors etc. / gives opportunity to play at a higher level; motivates the performer to play well; provides opportunity to analyse opponents tactics; able to analyse replays of own performances;	**2**
6(c)	*1 mark for each disadvantage.* for example: people become bored with too much sport / over exposure of sports may affect people's view of the sport; disruption when times are changed to show events live; increase in coverage usually means an increase for more popular sports so minority sports at risk of not being seen; reduction in attendance at live games means less of an atmosphere; increase in pay-to-view channels, which many people may not be able to afford; cost of televising an event may be large and this will be passed onto viewers through subscriptions fees; increases couch-potato syndrome / sedentary lifestyle; viewing experience may be reduced through interruption by adverts; *Allow ref. to disadvantage for general TV audience, e.g. desired programme is not aired due to increased coverage of sport.*	**2**

Question	Answer	Marks
6(d)	*1 mark for each advantage.* for example: promotes the country internationally; more people see aspects of the country; subsequently visit the country / in an increase in tourism to the country; increases trade with the country; improves the quality of television coverage / increases technology in the country; creates pride in the country / feeling of well-being; increases participation in the sport being shown / greater interest in sports; may be financial benefits for country from selling television rights;	**2**

Question	Answer	Marks
7(a)	*1 mark for describing an example of a skill.* for example shooting a ball in netball; *1 mark for describing an example of an ability.* for example jumping / running; *1 mark for an explanation of a difference between skill and ability.* for example: skills are: learnt / practised / sport-specific / more easily adapted whereas abilities are innate / you are born with them / general / enduring / difficult to change;	**3**

Question	Answer	Marks
7(b)	*1 mark for naming the stage of learning.* *1 mark for description.* *stage of learning:* associative stage; *description:* *Any 1 of:* lots of practice / repeats / improving in the skill / technique / fewer mistakes / more accurate / more consistent / more able to make adjustments in technique / more able to respond to verbal feedback / starting to develop intrinsic feedback / starting to concentrate for longer / less likely to be distracted / combine the subroutines of the skill / may use reduced court / environment / altered equipment / trying more advance skills and techniques / able to recognise more subtle cues;	**2**
7(c)	*1 mark for each difference described.* *Any 2 of*: short-term memory has a limited capacity / amount of information it can store **BUT** long-term memory is thought to be limitless; information is retained in the long-term memory **BUT** can be lost from the short-term memory (if not practised); all new information goes into the short-term memory **BUT** information cannot go directly into long-term memory; long-term memory holds information for long periods of time / short-term memory holds information for short periods;	**2**

Question	Answer	Marks
8(a)(i)	*Any 1 of:* flexibility / power / speed / agility / balance / coordination / reaction time / muscular endurance / cardiovascular endurance;	**1**

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Question	Answer	Marks
8(a)(ii)	*1 mark for naming a test that matches the fitness component.* *1 mark for each part of a description of the test (3 marks max.)* *Accept other standardised tests.* agility – Illinois Agility Test; cones mark out a specific course that is 10 metres long (Accept a diagram.); subject starts from a prone / press-up position, behind the start line with both legs extended behind; subject is timed and sprints as quickly as possible around the course; the best time from 3 attempts is compared to normative data tables; balance – Standing Stork Test; subject stands with hands on hips and raises one foot to place it on the inside of the standing leg; timer stops when the standing foot moves or standing foot heel touches the floor or non-standing foot loses contact with knee or a hand comes of the hip; some variants have eyes closed (e.g. Blind Standing Stork Test); the best time from 3 attempts is compared to normative data tables; coordination – Anderson Wall Toss Coordination Test; subject stand 2 metres from a plain wall with a tennis ball in their right hand; ball is thrown underarm to rebound off the wall and is caught in the left hand / the ball is then thrown underarm with the left hand to be caught by the right; this is then repeated as many times as possible; the number of catches made in 30 seconds is compared to normative data tables; reaction time – Ruler Drop Test; subject stands or sits with arms extended; an assistant holds a ruler vertically between the subject is thumb and first finger; ruler is aligned so that zero is level with the top of the subject's thumb; without warning, the ruler is dropped and the subject catches it as quickly as possible; the distance the ruler fell is recorded in cm; the average distance dropped from 3 attempts is compared to normative data tables;	**4**

Question	Answer	Marks
8(a)(ii)	cardiovascular endurance / stamina – Multi-Stage Fitness Test; performer must run in time with the bleeps on a CD / eq.; 20-metre / measured shuttles are performed; time between bleeps reduces as test progresses / bleeps get closer together / the subject must run faster; subject runs until they can no longer keep up with the bleeps; the level achieved and the number of shuttles performed within the level are recorded; scores are compared to standardised normative data; cardiovascular endurance / stamina – 12-Minute Cooper Run Test; subject runs / walks as far as possible; test duration is 12 minutes; a measured course is used, e.g. with cones placed at regular intervals to help identify the exact distance covered / measured laps; calculate the distance covered; the distance covered is compared to standardised normative data; flexibility – Sit and Reach Test; subject warms up thoroughly before performing test and removes shoes; subject sits with straight legs and feet flat against sit and reach box or a bench. if a bench is used a ruler is placed with 15 cm extended over the end of the bench and zero towards the subject; subject reaches forward with both arms extended as far as possible along the box / ruler; at full stretch the position must be controlled for the score to be recorded; the best score from 3 attempts is compared to normative data tables; muscular endurance – Multi-Stage Abdominal Curl Conditioning Test; subject performs sit up in time with the bleeps on a CD / eq.; arms are folded across the chest with elbows forward and knees bent; sit up for elbow to touch the knees; bleeps get progressively quicker each minute; subject performs until they can no longer keep up with the bleeps or technique loses correct form; the total number of sit ups is counted and compared to normative data tables;	

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Question	Answer	Marks
8(a)(ii)	power – Vertical Jump Test; subject adjusts vertical jump board so that the lower edge touches fingertips when arms are extended overhead and body if fully stretched with feet flat on the floor / if a vertical jump board is not available subject stands sideways on to wall with feet flat and extends arm nearest wall upwards to make mark with chalk held in fingers; subject bends knees and jumps as high as possible; marking the board / wall at the highest point using chalk or eq. method; measure the difference between the two marks; the best score from 3 attempts is recorded and compared to normative data tables; speed – 30-Metre Sprint Test; 30 metres is marked out on a selected flat running surface; a flying start is used; subject sprints as fast as possible from start through the finishing line; a stopwatch or timing gates can be used to record the time; the best score from 3 attempts is compared to normative data tables;	
8(b)	*1 mark for each reason.* for example: suitability of performer for different physical activities (a different distance or type of activity could be better for the performer); identifying strengths and weaknesses (identify areas of performance that need improvement); monitoring improvement / progression (after injury) / check for reversibility (ensures training is appropriate); comparisons to others (enables a coach to know when a performer is able to take part / inform positional choices / are they fit enough?); informing the design of a training programme / set targets / goals (the results may show a different type of training is needed); (test as a source of) motivation;	**2**

Question	Answer	Marks
9(a)(i)	66 bpm;	**1**
9(a)(ii)	40 (seconds);	**1**
9(b)	*1 mark for each description.* *Any 3 of:* after exercise the body takes in excessive amounts of air / oxygen / breathing rate stays high / reduces gradually; heart rate says high / reduces gradually; body temperature stays high / reduces gradually; removes carbon dioxide; removes lactic acid; allows a performer to maintain high rates of aerobic respiration to aid recovery to return the body to its normal state; restores glycogen;	**3**

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Question	Answer	Marks
10	*No mark for naming a physical activity.* *1 mark for each function.* *1 mark for each benefit.* shape / support – the ribs provide shape to the chest area – the ribs provide space for the lungs to fully inflate aids good cardiovascular endurance in sprint events; muscle attachments / movement – the ability to throw a javelin requires movement at the shoulder; protection – the cranium protects the brain – a footballer is able to head the ball without damage; (red) blood (cell) production – increased supply of oxygen to the muscles – cross-country runners can keep going for the whole race;	**4**

Question	Answer	Marks
11(a)	*1 mark for naming each structure.* *1 mark for describing a different function of each structure.* *structure A:* right atrium; *function:* receives deoxygenated blood from the body / the vena cava / pumps deoxygenated blood to the right ventricle; *structure B:* left ventricle; *function:* receives oxygenated blood from the left atrium / pumps oxygenated blood to the body / the aorta; *structure C:* valve; *function:* prevents back flow of blood; allows blood to be pumped from the heart to the body / aorta;	**6**

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Question	Answer	Marks
11(b)	*1 mark for each effect.* *Any 2 of:* heart size increases / hypertrophy / thicker walls; resting pulse rate / resting heart rate reduces / bradycardia; stroke volume increases / (maximal) cardiac output increases / the volume of blood pumped in one minute increases / increase in volume of blood pumped in a single beat; returns to resting heart rate more quickly; increased strength of / stronger contractions; reduction in heart disease / diseases;	**2**

Question	Answer	Marks
12(a)	*1 mark for describing each exercise (2 marks max.).* *1 mark for each correct benefit (2 marks max.).* *Answers should identify exercises that raise the pulse / stretch / are skill related etc.* *exercises could include descriptions of:* gentle jog / muscle stretches / dynamic stretching / skill-related activities; *benefits could include:* raise pulse / warm muscles / increase flexibility / prepare muscle movement for specific activity; *Accept other appropriate examples.*	**4**

Question	Answer	Marks
12(b)	*1 mark for each benefit.* for example: allows the performer to focus (on the activity); become familiar with the environment / more comfortable in the environment / accustomed to the environment; rehearse the tactics in the mind of the performer / visualise success; controls anxiety / allows the performer to be calm / relaxed before starting / increases confidence; raises arousal levels when appropriate; mental rehearsal of skills to be used;	**2**

Question	Answer	Marks
13(a)	*Any 1 of:* the volume of oxygen that can be used / consumed (while exercising) at a maximum capacity; the maximum volume of oxygen that can be used / consumed (while exercising); *Allow alternative wording.*	**1**
13(b)	*1 mark for identifying the activity.* *2 marks for explanation.* 1500-metre runner; *Any 2 of:* the 1500 m is the most aerobic activity; the performer will work at a low to medium intensity for most of the race; the 1500-m runner needs to have oxygen constantly supplied to the muscles to provide energy due to the duration of the activity / activity duration is longer than 3 minutes; the higher VO_2 max slows down the build-up of lactic acid / means improved efficiency at removing lactic acid;	**3**

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Question	Answer	Marks
14(a)	*1 mark for each correct reason. Allow yes or no, so long as the reason is explained correctly.* for example: *specific:* *reason* – yes, as it relates to the game of basketball and is focused on a specific skill within the game; *measurable:* reason – yes, as it is easy to measure and monitor at the end of each game as the points scored are recorded; *agreed:* reason – no, as the player set their own target without agreement from the coach / other players; *time-phased:* reason – yes, as the player has set themselves the time scale of by the end season, which is easy to identify;	**4**
14(b)	*1 mark for each cause.* for example: people watching / crowd; media coverage; bright lights; importance of the occasion / match; quality of opposition / fear of getting injured; not being fit / training not being completed well / being injured / not fully prepared; fear of failure / fear of performing badly; some personality types are more likely to feel anxiety; playing in an unusual surrounding; unfamiliar conditions, e.g. weather / playing surface; too much focus on the outcome / result rather than the performance; pressure from teammates / coaches / sponsors;	**3**

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Question	Answer	Marks
14(c)	*1 mark for each benefit explained.* *Examples may include:* identifies strengths / weaknesses; able to correct errors quickly before they become a routine part of performance / help design appropriate training programmes / use to set goals; ensures the performer knows if progress is being made / able to measure the progress being made; motivates the performer to continue to work hard by raising a performer's expectations of their own ability / by increasing confidence / by increasing arousal; maintains the performer's focus on the performance rather than the result; performer will feel supported / stops the performer from feeling isolated; ensures training time is not wasted;	**3**

Question	Answer	Marks
15(a)	*1 mark for each effect.* for example: *officials – positive effect:* difficult decisions can be reviewed to ensure they are correct / better communication between officials; *the audience/spectators – negative effect:* slows down the speed of the game / cost of technology used on subscription channels may be passed onto the viewer / reduced atmosphere as lower attendance due to ease of watching on computer etc. / broadcasted event having technology enhancements that are absent when watching the live event; *the sport / event – negative effect:* providing better timing systems / ticketing systems / big screens at events / improved synthetic pitches / faster tracks etc. increases costs / at high standards of competition the best facilities and equipment are expected / at a lower levels of competition the sport / event cannot afford the technology / changes the nature of the sport away from the traditional, e.g. number of challenges occurring from performers; *Accept other appropriate examples.*	**3**

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Question	Answer	Marks
15(b)	*1 mark for each benefit.* for example: communication with fans becomes easier / positive comments can build confidence; raises profile of performer; can attract sponsors / increase financial gain / crowd funding possible; get scouted / find a coach / team; communication with other performers becomes easier / able to set up chat groups to share training ideas / technical performance ideas with like-minded performers; easier to research training updates / diet / sports-science etc.; easier to research opponents / venues etc.; can have contact with coaches without the need to meet with coaches at every training session; allows the performer to know where events are being held and plan a season's participation commitments; get updates on new equipment available / reviews; makes travelling to events easier by planning routes / train journeys etc.; able to review own performance post-event; *Accept descriptions of other valid benefits.*	**2**

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Question	Answer	Marks
16(a)	*2 marks for:* contact to expand the chest cavity / move the ribs up and out during inspiration; relax to reduce the chest cavity / allow the ribs to move downwards and inwards during expiration; *Accept correct ref. to specific types of intercostal muscles.*	**2**
16(b)	*1 mark for the definition.* *1 mark for each benefit (2 marks max.).* *definition:* the volume of air that you breathe per minute; *benefit:* *Any 2 of:* increase in the volume of oxygen into the body; increases the volume of carbon dioxide removed from the body; increases oxygen supply to muscles / keep going for longer; increases the efficiency of diffusion of oxygen through the alveoli / capillaries; reduces the onset of lactic acid / speeds up removal of lactic acid;	**3**
16(c)	*1 mark for each description.* (residual volume) does not change; (tidal volume) increases;	**2**

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