Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICAL EDUCATION **0413/11**

Paper 1 Theory **October/November 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:* arteries; capillaries; veins; *Accept other named types of blood vessel.*	**2**

Question	Answer	Marks
2(a)	*No mark for just naming components of fitness.* *components of fitness may include:* agility / balance / cardiovascular endurance (stamina) / coordination / flexibility / muscular endurance / power / reaction time / speed / strength; *1 mark for describing a benefit of each component of fitness when playing table tennis, for example:* agility: able to change direction quickly to be able to return a shot when it is played with speed / change from forehand to backhand quickly; balance: being able to remain in control of movement when reaching for a shot without falling over; cardiovascular endurance / stamina: players may have to play long matches / many games; coordination: players need to coordinate hand and eye to be able to hit the ball / to be able to play shots whilst moving around the table; flexibility: being able to stretch to reach a ball when it is dropping off the table; muscular endurance: rallies can last a number of shots and force the player to play similar shots repeatedly;	**4**

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Question	Answer	Marks
2(a)	power: being able to smash the ball to win a point / move your opponent away from the table; reaction time: the ball can be played at high speed so a player has to be able to respond to a ball returned at speed; speed: the player needs to move quickly to return shots / fast arm speed needed to generate power in shots; strength: the player needs to generate a large force to hit some shots hard;	
2(b)	*No mark for naming the test.* *1 mark for each part of a description of the test (3 marks max. per test)* *Accept other standardised tests.* 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; sprints as quickly as possible around the course; subject is timed; (the best time from 3 attempts) is compared to normative data tables; Standing Stork Test: subject stands on one leg (on toes); raises other foot to place it on the inside of the standing leg / subject stands with hands on hips; timer stops when the standing foot moves / standing foot heel touches the floor / non-standing foot loses contact with knee / 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; 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 **OR** the number of catches made in 30 seconds; compared to normative data tables;	**6**

Question	Answer	Marks
2(b)	Ruler Drop Test: subject stands or sits with arm extended; an assistant holds a ruler vertically between the subject's 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; 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; 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; Sit and Reach Test: subject warms up thoroughly before performing test and removes shoes; subject sits with straight legs / feet flat against sit and reach box or a bench; if a bench is used a ruler is placed 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 distance of the finger tips is measured; (the best score from 3 attempts is) compared to normative data tables;	

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Question	Answer	Marks
2(b)	Multi-Stage Abdominal Curl Conditioning Test: subject performs sit ups 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 / body to be at 90 degrees; bleeps get progressively quicker each minute; subject performs until they can no longer keep up with the bleeps / technique loses correct form; the total number of sit ups is counted; and compared to normative data tables; Vertical Jump Test: subject adjusts vertical jump board so that the lower edge touches fingertips when arms are extended overhead and if body 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; 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; 1 Rep Max Test: subject attempts lift once, starting with a high weight that is achievable; weight is increased; until subject cannot perform one repetition; the maximum weight a performer can lift in one repetition is recorded; a variety of exercises can be used (usually leg press or bench press); a rest of up to 3 minutes is allowed between lifts; use weight that can be lifted more than once, e.g. 4 to 6 times; then use formula to calculate 1 Rep Max from this; compared to standardised normative data;	

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Question	Answer	Marks
2(b)	Hand Grip Dynamometer: may use dominant hand; arm may start above the head / arm may be held by side of the body / may have arm at 90-degree angle at elbow / the arm must not touch the body; apply as much grip pressure as possible / squeeze as hard as you can; for approx. 3 to 5 seconds; record the maximum reading; (3 attempts are recorded and the highest score) compared to standardised normative data;	

Question	*Answer*	Marks

3	*agonist:*
	hamstring(s) (group);
	antagonist:
	quadriceps(s) (group);
		2

Question	*Answer*	Marks
4(a)	*1 mark for each disadvantage described.* for example: an amateur may have less time to train; an amateur may have to work to fund participation; an amateur may have limited opportunities to access specialist training, e.g. altitude / warm weather training; an amateur may have had less funding; an amateur may have restricted access to coaching / sports science / higher-quality equipment / travel, etc.; an amateur may have had limited opportunities to compete at high level events / not allowed to compete in certain events due to low world rankings / may have less experience; *Accept descriptions of other disadvantages and accept reverse arguments.*	**2**

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Question	Answer	Marks
4(b)	*1 mark for each appropriate suggestion.* for example: provide sports facilities after the event for future use; improvements in transport infrastructure, e.g. road / rail / airports; redevelopment of the area that hosted the event, e.g. improvements in housing / hotels / shops; increase in participation levels in sports / particularly at grass roots / foundation level / in schools; greater awareness about sports / publicity; improvements in coaching structures / better identification of elite performers; establish / continue elite events, e.g. anniversary games; *Accept other examples.*	**2**

Question	***Answer***	Marks
5(a)	*1 mark for naming each type of PED.* *1 mark for naming an appropriate physical activity.* *1 mark for explaining an advantage the named PED may provide.* 2 PEDs from: anabolic steroids; diuretics; stimulants; beta blockers; *for example for anabolic steroids*: physical activity: mountain biking; advantage: increases muscle mass / increases power / strength / train harder / performer can maintain power up steep hills;	**6**

Question	Answer	Marks
5(a)	*for example for diuretics*: physical activity: judo; advantage: weight loss / enables a performer to lose weight quickly / able to achieve a lower weight category / gives the advantage of having greater power to weight ratio than opponents; *for example for stimulants*: physical activity: competitive swimming; advantage: increases alertness / increase speed of reaction / responds faster to the starter to get a faster start; *for example for beta blockers*: physical activity: golf; advantage: reduce anxiety / prevents adrenaline being released / reduces heart rate / calming / relaxing effect / need to be calm and have a high level of control when putting the ball; *Accept other examples*.	
5(b)	*1 mark for each type of test, for example*: urine test; blood test; *Accept other examples of appropriate tests.*	**1**
5(c)	*1 mark for description of a consequence.* for example: negative publicity / bad image / bad reputation; reduces interest / reduces participation levels / parents less likely to want their children to play that sport; media less likely to advertise events in that sport / reduction in media coverage; loss of sponsorship / sponsors would not want to be associated with a scandal; possible loss of government funding; loss of integrity for the sport / sports being banned from global events; *Accept other examples.*	**2**

Question	Answer	Marks
6(a)	*No mark for naming the physical activity.* *1 mark for identifying each phase. (3 marks max.)* *1 mark for describing an appropriate activity for each phase. (3 marks max.)* *for example for football*: phase 1: pulse raiser; gentle jog; continuous two-footed jumps; skipping with a rope for one minute; phase 2: stretches; for a lunge, position with one leg forward and ankle directly below knee, trailing leg straight behind you, lower hips downwards and forwards, holding that position; for heel flicks, stand upright, bring heel up to touch hands when held behind and repeat for alternate legs; phase 3: familiarisation / skill-related activities; dribbling a ball in and out of cones; receive a ball on edge on penalty area, control ball then shoot; *Accept other appropriate examples if related to the named activity.*	**6**
6(b)	*1 mark for each technique described.* for example: mental rehearsal: running through the skill / sequence / event in your mind; visualisation: imagining the best positive outcome for the skills or techniques that you are about to perform / picturing success; deep breathing: taking slow / deep breaths / focusing on the rhythm of breathing; *Accept description of other relevant techniques.*	**2**

Question	Answer	Marks
6(c)	*1 mark for each reason given.* for example: allows heart rate / blood flow to reduce **gradually** to normal levels; reduces breathing rate **gradually**; reduces muscle / body temperature **gradually;** removes carbon dioxide; speeds up reduction in oxygen debt; removes lactic acid from muscles; restores glycogen; may reduce muscle soreness / stiffness later; may reduce the risk of injury; reduces blood pooling;	**2**

Question	Answer	Marks
7(a)(i)	performance;	**1**
7(a)(ii)	label added at the top of the curve;	**1**
7(b)	*No mark for naming a physical activity.* *for example in Rugby:* *1 mark for an example of a skill requiring a high level of arousal.* for example, tackling in Rugby; *1 mark for an example of a skill from the same physical activity requiring a low level of arousal.* for example, taking a penalty kick in Rugby; *1 mark for explanation of why optimal level of arousal is low:* for example, low arousal: fine skill / requires precision / stay calm; *1 mark for explanation of why optimal level of arousal is high:* for example, high arousal: gross skill / requires all-out effort / controlled aggression;	**4**

Question	Answer	Marks
8(a)(i)	*1 mark for naming the missing axis.* *1 mark for accurately drawing the bars with appropriate axis values.* *1 mark for naming / labelling the bars on the x-axis.*	**3**
8(a)(ii)	*1 mark for naming an appropriate physical activity.* *1 mark for an appropriate reason.* X: accept appropriate endurance activity, for example cross-country running; *1 reason from:* VO_2 max is an indicator of cardiovascular fitness / more oxygen is required / consumed / the muscles need to work for a long time / it is an endurance activity;	**2**
8(b)	*2 marks max. can be awarded for developing a single factor.* for example: age: VO_2 max values are highest in young adults; the elderly will typically have lower VO_2 max values; young children typically have lower VO_2 max values; gender: VO_2 max values are typically higher in males than females; females typically have smaller lungs / smaller amount of blood pumped around the body; genetics: the genetic makeup of some people means they can use oxygen more efficiently; the size of the heart / type of muscle fibres are partly inherited; lifestyle: smoking may prevent VO_2 max improving; a sedentary lifestyle may lower VO_2 max values; training: focusing on cardiovascular activities will increase VO_2 max; activities such as long-distance running will increase;	**5**

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Question	Answer	Marks
9	*1 mark for each correct classification.* flat bone; long bone; short bone;	**3**

Question	Answer	Marks
10(a)	*1 mark for naming an appropriate food source for each nutrient.* *Food sources must be different.* for example: carbohydrates: bread / potatoes / pasta; protein: eggs / fish / pulses; fat: butter / oils / avocado; *Accept other examples of foods rich in the named nutrients.*	**3**
10(b)	*1 mark awarded for each suggested reason.* for example: the runner may have a higher intake of carbohydrates as he needs a greater energy store than the shot putter; the runner will need to perform for a longer duration so needs more energy sources / carbohydrates; the runner may carboload on carbohydrates in the week before an event / to increase glycogen stores in the muscle; the shot putter may consume higher levels of protein to build muscle / increase power / power-based activity; the runner will consume more carbohydrates for energy due to an endurance activity; the explosive nature of training / performing for the shot putter causes a high level of muscle damage / the need for more protein to aid repair; the runner may need lower amounts of protein due to less damage / only needs protein for repair not growth; the runner will need fats as an energy source when carbohydrates are used up; the runner's diet may only contain small amounts of fat to prevent an increase in body weight; the shot putter may use fats to increase body weight; the runner may need to consume more water to maintain hydration during a longer performance; the runner may need to consume water during the event / the shot putter doesn't need to consume during event as they do not lose as much water through sweat;	**6**

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Question	Answer	Marks
11(a)	*1 mark for:* the volume of blood pumped from the left ventricle / from the heart each minute; *Accept alternative wording.*	**1**
11(b)	*1 mark for showing working / the correct formula.* *1 mark for the correct answer*: *1 mark for the unit.* heart rate × stroke volume; **OR** 75 × 85; 6375; ml per min; *Allow correct answer for other units.*	**3**
11(c)	*1 mark for correctly naming each structure.* *1 mark for each correct description.* structure A: vena cava; description: carries (deoxygenated) blood from the body to the right atrium; structure B: aorta; description: carries (oxygenated) blood from the left ventricle to the body; structure C: pulmonary vein; description: carries (oxygenated) blood from the lungs to the left atrium;	**6**

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Question	Answer	Marks
11(d)	*1 mark for each correct long-term effect.* for example: increased strength of / stronger contractions; reduction in heart disease / diseases; 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;	**3**

Question	Answer	Marks
12	*2 marks max. for each justification of an appropriate classification.* for example: *opened and closed:* *the serve is closed because:* the skill has similar actions each time; the serve takes place from the same position; net height is always the same / court size is the same; the performer is in control of the pace and direction of the serve; *basic and complex:* *the serve is complex because:* the serve requires high level of coordination / accuracy / precision; the serve requires a high level of concentration; the skill can only be produced well with practice; the serve is a combination of multiple parts / sub-routines; requires decision-making, e.g. where to serve the ball; *Credit appropriate justifications if classified differently / partially, such as opponent may stand in different position.*	**4**

Question	Answer	Marks
13(a)	*1 mark for correctly naming each stage.* *1 mark for describing a characteristic of each stage.* first stage of learning: cognitive stage; for example: low ability / beginner; does not have a mental image of the skill; does not know how to perform the skill / large number of mistakes; need a high level of support / coach input / does not know how to do the skill without guidance; needs to work slowly and repeat actions; much conscious thought about how to perform the skill; second stage of learning: associative stage; for example: lots of practice / repeats; improving in the skill / technique; combine the subroutines of the skill; 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 / still needs some extrinsic feedback; starting to concentrate for longer / less likely to be distracted; may use reduced court / environment / altered equipment; trying more advanced skills and techniques; able to recognise more subtle cues; third stage of learning: autonomous stage; for example: able to perform the skill without conscious thought; few mistakes made; consistent / successful outcome; able to adapt to different situations; able to analyse own performance / intrinsic feedback; links skills at pace / smoothly;	**6**

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Question	Answer	Marks
13(b)	*1 mark for naming a type of guidance.* *1 mark for each appropriate example.* guidance: visual / verbal / manual / mechanical; for example: *visual:* use of demonstrations to enable the skill to be seen in the context; use of posters / charts displayed, e.g. in changing rooms to show how a skill is performed; video of own performance / video of elite performer to be able to analyse performance / determine areas to improve / see own strengths / weaknesses / use of slow motion to highlight key area; use of visual cues, e.g. targets / cones etc. to identify areas to hit a ball; *verbal:* coach reminds a team of tactics before a game; questioning allows a coach / teacher to assess the level of understanding; provide accurate descriptions of skills / give instructions; *manual / mechanical (accept examples of manual and mechanical):* *manual:* adjust the physical position of a player, e.g. move a tennis player's arm in a forehand stroke; support a performer during a handstand; *mechanical:* help a performer to develop a feeling for an activity, e.g. floats allow a performer to establish the body position needed; use of harnesses to reduce the danger when performing, e.g. a harness to help a somersault to be completed; *Accept other descriptions of examples of how to apply each type of guidance*.	**3**

Question	Answer	Marks
14(a)	for example: difficult decisions can be reviewed to ensure they are correct / better communication between officials; *Accept other examples.*	**1**
14(b)	*No mark for naming physical activities.* *1 mark for each correct example.* for example: cricket: ear pieces allow those attending the match to watch the game and listen to commentary to have a greater understanding; rugby: technology such as retractable roofs ensure the games take place despite the weather; football: large screens allow spectators to see highlights / slow-motion replays / CCTV makes stadia safer; swimming: underwater cameras provide different angles to allow spectators to see parts of the activity that would usually be out of sight; athletics / cycling etc.: use of visible timing systems that allow spectators to know situations during races; tennis: ball-tracking technology / hawk eye allows spectators to see if decisions are correct; *Accept other examples.*	**2**

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Question	Answer	Marks
14(c)	*1 mark for each appropriate suggestion.* for example: communication with fans becomes easier / positive comments can build confidence / supply motivation; 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 / able to compare own performances to others. etc.; easier to research opponents / venues. etc.; can have contact with coaches without the need to meet with coaches at every training session / receive extrinsic feedback; 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 other appropriate suggestions.*	**2**

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Question	Answer	Marks
15(a)	*1 mark for each characteristic described.* for example: outgoing / enjoys the company of others / play team sports; loud / happy to speak in company / talk over others; has energy / is lively / displays high levels of energy; confident / needs little persuasion to try new skills / willing to take risks; lacks concentration / becomes bored quickly; may get frustrated easily / may lack patience when performing fine skills;	**2**
15(b)	*1 mark for naming an appropriate activity.* *1 mark for an appropriate reason.* for example: cross-country running / orienteering / weight training for fitness; *Accept other appropriate examples of activities that can be individual / played in singles.* *reasons could include:* does not need to have high levels of interaction with others / activities have routines / require concentration / require accuracy / usually use fine skills / generally non-contact / do not like contact with others / prefers to perform alone / can train without the need to be in a group or team / can choose the level of interaction with others / does not require a high level of arousal / activity allows self-absorption / low tolerance of pain;	**2**

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