Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICAL EDUCATION **0413/12**

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.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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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	*1 mark for each correct description of a function.* for example: gives protection to vital organs / when being hit / when falling; allows muscle (attachments) to create movement / movement to allow a performer to push an opponent away etc.; provides shape / support for appropriate body position (to give a physical advantage such a long reach); provide shape / support to provide a framework to support the organs and tissues of the body; produces red blood cells that help transport oxygen (for better endurance) / to maintain performance / platelets clot blood to allow a performer to continue when they have a minor cut; *Accept descriptions of how other functions of the skeleton benefit a performer.*	**2**

Question	Answer	Marks
2(a)	*1 mark for naming the type of muscle contraction.* *1 mark for a description of the type of muscle contraction.* *type of muscle contraction:* isometric; *description:* muscles contract but they stay the same length / contracting but no movement occurs;	**2**

Question	Answer	Marks
2(b)	*1 mark for naming each correct type of muscle contraction.* *1 mark for a correct description of the type of muscle contraction.* *(2 marks max. for position A to B and 2 marks max. for position B to A).* *position A to B:* concentric contraction; when contraction takes place while the muscle shortens; *position B to A:* eccentric contraction; when contraction takes place while the muscle lengthens;	**4**
2(c)(i)	*1 mark for each suitable named physical activity. Physical activities must be different.* for example: *slow-twitch fibres:* cross-country running / (long-distance / road) cycling / (long-distance) swimming; *fast-twitch fibres:* sprinting / named throwing event, e.g. shot put / named jumping event, e.g. long jump; *Accept other appropriate physical activities.*	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(c)(ii)</td><td>1 mark for each description of a difference between the types of muscle fibre.

2 from:
<table>
<tr><th>fast twitch</th><th></th><th>slow twitch</th></tr>
<tr><td>contracts quickly</td><td>AND</td><td>contracts slowly;</td></tr>
<tr><td>produces large force</td><td>AND</td><td>produces little force;</td></tr>
<tr><td>low fatigue tolerance / tire quickly / short period of time</td><td>AND</td><td>high fatigue tolerance / do not tire quickly / long period of time;</td></tr>
<tr><td>good for strength / power / speed</td><td>AND</td><td>good for endurance;</td></tr>
<tr><td>anaerobic energy supply</td><td>AND</td><td>aerobic energy supply;</td></tr>
<tr><td>white colour</td><td>AND</td><td>red colour;</td></tr>
</table></td><td>2</td></tr>
</table>

Question	Answer	Marks
3	*1 mark for each component.* *Any 2 of:* red (blood) cells; white (blood) cells; plasma; platelets;	**2**

Question	Answer	Marks
4(a)	*1 mark for each description linked to physical activity.* for example: increase in number of people watching event / crowd; increase in media coverage at event; bright lights / novel environment / performing in unusual surroundings; importance of the occasion / match; perceived high quality of opposition at event; not being fit / training not being completed well before event / being injured / not fully prepared for event; fear of failure / fear of performing badly at event; introverts may be more anxious in a team game / extroverts may be more anxious in an individual activity; unfamiliar environmental conditions, e.g. weather / playing surface; too much focus on the outcome / result of event rather than the performance during event; pressure to perform from external source, e.g. team mates / coaches / sponsors / social media; pre-performance anxiety, e.g. in call room / standing waiting to go out; *Accept other appropriate descriptions.*	**2**
4(b)	*1 mark for stating a correct technique.* *any 2 of*: mental rehearsal; deep breathing; visualisation; *Accept other appropriate examples.*	**2**

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Question	Answer	Marks
5(a)	*1 mark for naming each component.* *1 mark for each description of a function of each component*. *Functions must be different.* *A:* synovial fluid; *function:* acts as a lubricant / allows smoother movement / reduces wear and tear / reduces friction / absorbs shock; *B:* synovial membrane / joint capsule; *function:* produces the synovial fluid / lines the cavity of a joint / encloses the joint / protects the joint / holds the bones together; *C:* cartilage; *function:* stops the bones rubbing together / acts as a shock absorber / cushion / reduces friction;	**6**
5(b)	*No mark for naming a physical activity.* *Types of movement must be different and appropriate.* *Examples must be applied to the same physical activity.* *1 mark for stating an appropriate type of movement at each joint.* *1 mark for an appropriate example in the named physical activity.* *Max. 2 marks for each type of joint.* for example in basketball: *hinge joint:* type of movement: extension / flexion; example for extension: straightening the elbow during the shooting action; *ball and socket joint:* type of movement: flexion / extension / abduction / adduction; *(Accept circumduction / rotation;)* *example for abduction:* *when raising the arm at the side to block a pass;* *Accept descriptions of other examples.*	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>6(a)</td><td>1 mark for:
anaerobic (respiration);</td><td>1</td></tr>
<tr><td>6(b)</td><td>1 mark for each description of a difference between the two types of respiration.
<table>
<tr><th>A</th><th></th><th>B</th></tr>
<tr><td>converts glucose into energy without oxygen being present / anaerobic</td><td>AND</td><td>converts glucose into energy with oxygen being present / aerobic;</td></tr>
<tr><td>energy can only be released for a short period of time</td><td>AND</td><td>energy can be released over a long period of time;</td></tr>
<tr><td>lactic acid is produced</td><td>AND</td><td>lactic acid is not produced;</td></tr>
<tr><td>waste product is lactic acid</td><td>AND</td><td>waste products are water AND carbon dioxide;</td></tr>
<tr><td>muscles tire / fatigue quickly / high intensity</td><td>AND</td><td>muscles can maintain contractions over long period of time;</td></tr>
<tr><td>an oxygen debt is created</td><td>AND</td><td>an oxygen debt is not created;</td></tr>
<tr><td>allows muscles to contract quickly / releases energy quickly / high intensity</td><td>AND</td><td>energy is produced slowly / releases energy slowly / low intensity;</td></tr>
</table></td><td>4</td></tr>
</table>

Question	Answer	Marks
7(a)	*1 mark for each correct response.* *male:* average; *female:* above average;	**2**
7(b)	cardiovascular endurance / stamina;	**1**

Question	Answer	Marks
7(c)	*1 mark for each description of how the test is carried out.* *Any 4 of:* 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;	**4**

Question	Answer	Marks

8(a)	*1 mark for each correct response.*
	agonist: quadricep(s) (group);
	
	antagonist: hamstring(s) (group);
		2

8(b)	*Any 2 of:* use of 1 rep. max.; find directly: the maximum weight a performer can lift in one repetition / weight is increased until subject cannot perform one repetition; find indirectly: using weight that can be lifted more than once, e.g. 4 to 6 times; use formula to calculate 1 rep. max from this;	**2**

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Question	Answer	Marks
9(a)	*Candidates can gain all 3 marks for a well-developed answer focusing on a single area.* *1 mark awarded for each correct influence described, for example:* geography: the area may have easy access to a natural environments, such as living near mountains, which makes it easy to access skiing; *(Accept the same point developed for coast / lakes, etc.)* if the climate is poor it becomes difficult for the performer to plan training and remain motivated in some activities; outdoor facilities may be unavailable because of weather conditions; the temperature may be extreme so may put performers at physical risk in some activities; the climate may be appropriate to enable certain activities to take place, e.g. snow will encourage skiing; culture: certain countries limit the access of females due to religious restrictions / beliefs; there are still forms of racism, which may limit participation for certain groups; people moving to live in a new country may not have access to sports that were part of their culture; lack of media coverage restricts awareness of certain activities; the culture of certain sports can attract or deter people from being involved, e.g. argumentative nature with officials in Football versus Rugby; it may be expected that older people will not participate in certain activities in some countries / areas; tradition: some areas have a tradition of playing / tradition of success in certain sports / activities so there are more opportunities available / more likely to take part, e.g. Rugby in New Zealand / Basketball in the USA; may be difficult to access non-traditional activities; what is taught in school may seek to maintain the tradition of that particular country / restrict exposure to activities; stereotypical attitudes may limit equality of access / opportunity; socioeconomic features of the area: limited facilities / equipment / governments / local governments may spend different amounts on facilities so some areas have limited opportunities; private companies are less likely to open facilities in areas of high deprivation; people may have to travel large distances to reach facilities not available where they live; *Accept other valid points and reverse arguments, such as urban areas may have higher populations allowing more opportunities / rural areas may have lower populations and so limited opportunities.*	**3**

Question	Answer	Marks
9(b)	*1 mark awarded for a correct description from each area*. *Max. 1 mark per area.* *physical health and well-being:* enables all body systems to work well / maintains good mobility / reduces the frequency of illness / injury / disease / able to carry out everyday tasks; *(Accept examples such as reduces obesity.)* *mental health and well-being:* able to cope with the stress / able to control emotions / feeling good / have good self-esteem / eq. / gives performers confidence; *social health and well-being:* meets essential human needs / has friendship / support / feels that they can make a positive contribution / has value within society / has the ability to mix with others / team mates / opponents;	**3**

Question	Answer	Marks
10(a)	*1 mark for naming each appropriate component. (2 marks max.)* *1 mark for describing each appropriate benefit. (2 marks max.)* for example: agility / balance / coordination / flexibility / muscular endurance / speed / strength; agility: the ability to change direction when approaching the bar at speed to allow the body to go over the bar; balance: during the run up and take-off the performer needs good balance to ensure that the movement is upwards rather than sideways; coordination: being able to time lifting the legs at the highest point of the jump / moving arms and legs appropriately to achieve maximum height; flexibility: being able to arch / curve the back when going over the bar; muscular endurance: a jumper may have to make a number of jumps and needs to be able to perform at their best when most tired, e.g. to stay in the competition; speed: the run up may require speed to convert into / transfer into / create upward force / power at the point of take-off; strength: the run-up needs leg strength to generate height / power in the jump; *Accept other examples of appropriate components of fitness*.	**4**

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Question	Answer	Marks
10(b)	*1 mark for each appropriate training method named.* *1 mark for each example of an exercise described.* *2 marks max. for the examples for each training method.* *Examples of exercises must be described.* for example: weight training; fartlek training; plyometric training; circuit training; high-intensity interval training (HIIT); weight training: use free weights, e.g. a bench press a heavy weight / low reps; resistance machine, e.g. a lat pull-down with heavy weight / low reps; a kettlebell squat with heavy weight / low reps; fartlek training: running at different speeds to include fast pace, e.g. sprint up an incline / slope for 30 seconds then jog down the slope; different terrains, e.g. sprint for 15 seconds on a soft surface / sand then walk slowly for 30 seconds; cycling, e.g. cycle on an inclined slope then slow cycle; plyometric training: depth jump, e.g. the performer jumps off a box then immediately jumps as high as possible; hurdle jump, e.g. continuous two-footed jumps over a series of hurdles; circuit training; *Credit any 2 descriptions of how stations can be used to improve power.* for example: low repetition squat jumps holding a weight; medicine ball slams;	**6**

Question	Answer	Marks
10(b)	HIIT; *Credit any 2 descriptions of how periods of work and rest can be manipulated to increase power including short sprints.* for example: clap press ups – holding a press up position, lower body then extend the elbows to push up and clap, then repeat; mountain climbers, from a plank position drive alternate knees towards chest in a continuous motion; *Accept other appropriate descriptions of examples.*	

Question	Answer	Marks
11(a)	*1 mark for correctly labelling of the x-axis.* *1 mark for correctly labelling of the y-axis.* *1 mark for correctly plotting all points on the graph and including a line*.	**3**
11(b)	*1 mark awarded for a prediction.* *1 mark awarded for a reason that supports the prediction.* *prediction:* 115 / the heart rate stays the same; **OR** higher than 115 / the heart rate increases; *1 mark for an appropriate reason:* *stays the same:* performer has a high level of cardiovascular fitness; performer is not fatiguing; oxygen supply meets the demand of the muscles; exercise is aerobic; the results show the heart rate response has levelled off; **OR** *increases:* the heart rate is still responding to the exercise;	**2**

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Question	Answer	Marks
11(c)	*1 mark for each appropriate effect.* for example: adrenaline is produced / released into the blood; breathing rate increases / more oxygen enters the lungs; body temperature increases / muscles become warmer; sweating; blood vessels closer to the skin enlarge to release heat / vasodilation / redistribution of blood / red skin; fatigue / feeling tired; suffering from nausea / feeling light-headed / feeling unwell; more carbon dioxide is produced; lactic acid is produced; increase in stroke volume; increase in cardiac output; increase in tidal volume; increase in minute volume; increased blood flow to muscles / oxygen supply to muscles; increased blood pressure; *Accept other correct responses.*	**4**

Question	Answer	Marks
12(a)	*1 mark for each correct response.* for example: fluent; aesthetically pleasing; consistent; accurate; goal-directed; coordinated; *Accept other appropriate examples.*	**3**

Question	Answer	Marks
12(b)	*1 mark for naming each factor (2 marks max.)* *1 mark for explaining the effect of each named factor. (2 marks max.)* *factors:* for example: age / maturity / experience / stage of learning; culture; motivation; anxiety; arousal conditions; facilities; environment; teaching / coaching / practice; *Accept other valid answers.* explanations, for example: age / maturity, etc.: performers who are young may not have the experience of being in a particular situation before / may not know how to react / may not yet have developed the physical attributes to be able to perform well / impacts of school / work commitments for relevant age group; culture: some cultures may not provide opportunities to develop skills due to restrictions on performers, e.g. females may not be able to swim in mixed sessions so may not have many opportunities to develop swimming skills; motivation: a performer who lacks motivation is unlikely to develop skills as they might drop out when training becomes difficult / a highly motivated performer will always train hard and give the effort required; anxiety: some performers are naturally more anxious than others / concerned that they may not be able to play well / may let their team mates down / concerned when they are being watched, etc.; arousal conditions: the perceived quality of the opposition may cause high arousal which lowers the skill level / arousal levels affect focus / cause distraction / the importance of the event affects the arousal level; facilities: the kind of facilities that are available and accessible will influence the activities that a person takes part in / this would include the costs of facilities;	**4**

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Question	Answer	Marks
12(b)	environment: if a performer lives in an area which has high snowfall they will be able to ski more often than someone who lives a distance from slopes and has to travel; teaching / coaching, etc.: the higher the quality of coaching / teaching available and more practice / training the faster the speed of development; *Accept other valid explanations.*	

Question	Answer	Marks
13(a)	*4 marks max. for either advantages or disadvantages.* for example: *advantages:* provides high levels of publicity / media exposure / advertisement opportunities / allows the company to be seen in a wider / international market / increase awareness; provides an image to customers that is positive / being linked with a successful player / team creates the image of a successful company; increased sales, e.g. of product / more money / increased profit; allows new products to have a high-profile launch; can use the event / match for corporate activities; sponsorship can reduce a company's tax bill; *disadvantages:* costs / costs can escalate / become unmanageable; reputation may be affected by the event / behaviour of players / scandals; may not have total control over how the company is represented; may have to share sponsorships deal with a club / event; sponsors may not get value for money / may not gain the level of publicity that they feel their financial commitment deserves; player / team may perform poorly / player may be injured so very little / no publicity; *Accept other advantages / disadvantages.*	**6**

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Question	Answer	Marks
13(b)	*1 mark for each appropriate description.* for example: financial support / pay for daily living expenses / pay for supply coaching / pay for travel / pay for accommodation / pay for medical support / healthcare; supply clothing / footwear / drinks / sports nutrition / equipment / sports players wearing branded goods / company logo on shirts, etc.; provision of specialist facilities / naming stadia after a company / providing timing equipment; *Also accept:* high-profile events become named after sponsor; companies may provide transport at events; companies who sponsor an event may use it to sell food / eq. via outlets / exclusive rights at venue; *Accept other examples including sport-specific examples.*	**3**

Question	Answer	Marks
14(a)	*1 mark for each description.* *intrinsic motivation:* motivation that comes from within you / self-motivation / from doing the activity for fun / for its own sake / for pride; *extrinsic motivation:* motivation that comes from outside the person / from external influences;	**2**

Question	Answer	Marks
14(b)	*1 mark for each appropriate disadvantage.* for example: needs rewards to be motivated to want to play; rewards will need to get bigger to maintain interest over time; increase in pressure to win; as the prize becomes more important than the game / performance / less focus on the performance compared to the result; if the reward is too easy / too difficult it can demotivate the performer; may cause the performer to develop a win-at-all costs attitude; may cause the performer to cheat / take drugs, etc.; may reduce / negatively affect intrinsic motivation; *Accept other examples.*	**2**

Question	Answer	Marks
15(a)	*1 mark for the definition.* *1 mark for an appropriate example.* *perceived risk:* an individual's personal judgement / subjective judgement / fear / worry about the dangers of an activity; *Accept alternative wording.* *example:* fear / worry about falling into the water / fear the water is too deep / fear of not being able to get out of the boat if it overturns / fear of what is under the surface of water / fear of getting too far from land, etc. / fear that flotation jackets will not be effective / fear of drowning;	**2**

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Question	Answer	Marks
15(b)	*1 mark for each appropriate strategy to reduce a real risk in a water-based outdoor and adventurous activity.* for example: protective clothing and equipment, e.g. wear a drysuit (to prevent hypothermia in cold water); wear a lifejacket / buoyancy aid during the activity (to prevent drowning); wear a helmet (to reduce damage from impacts, e.g. rocks or other objects); ensure that performers wear sun block (to prevent sunburn); wear appropriate clothing, e.g. life preservers should be correctly fitted (to ensure they allow easy movement); do not wear items around the neck, e.g. jewellery (as they can become stuck around rocks, etc.); suitable level of competition / inexperienced performers should not go into dangerous water (to avoid dangerous situations, e.g. do not get close to branches); experienced performers shadowing inexperienced performers / have appropriate level of supervision (to allow help when needed); lifting and carrying equipment safely, e.g. when moving boats into water (to prevent injury); take supplies of water (to prevent dehydration); suitable warm up and cool down (to reduce risk of injury); follow rules / instructions, e.g. re: navigation around boats / safe use of paddles; carry out / implement a risk assessment, e.g. check equipment is safe to use / check environmental / weather conditions / check competency in water; *Accept other descriptions.*	**3**

Question	Answer	Marks
16(a)	*1 mark for each correct description.* for example: time required to study reduces time available to participate; provide physical education as part of the curriculum; provide facilities / equipment; provide coaching / teaching; provide sports clubs / extra-curricular activities; provide competitive sports fixtures; offer examinations courses; provide scholarships in sport; create links with external sports clubs / sports centres; give opportunities of being a sports official; if children have had positive or negative experience of physical activities in school this can affect how likely they are to continue participating after leaving school; some schools focus on a small number of activities, which restricts opportunities; gaining greater understanding / e.g. from watching an activity on the television / going to a live game event / participating at school; families can inform young performers about how to take part in activities; *Accept other examples and reverse arguments, e.g. positive or negative effects.*	**2**

Question	Answer	Marks
16(b)	*1 mark for each description.* for example: ensure easy access with ramps / automatic sliding doors / wide doorways; disabled car park spaces close to entrance; easy access (lifts) to areas on higher levels / areas for disabled performers on ground level; sound loops at reception areas / braille signs on notice boards / good-quality lighting / clear signage; guide dogs welcomed; specialist coaches available / have coaches available with knowledge / experience of working with disability groups; provide competitive sports opportunities for performers with disabilities / provide competitions; adapted changing area / shower cubicles / easy access toilets; swimming pools have hoists; specialist equipment available, e.g. lower nets for sitting volleyball; community links with schools to encourage participation; advertise facilities / disabled activities available / use of media to raise awareness of disability sport opportunities; use of more disabled role models; employ people to aid disabled performers; subsidise / concession / lower charges for disabled performers; free admission for carers; *Accept other examples.*	**4**

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