Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICAL EDUCATION **0413/13**

Paper 1 Theory **October/November 2023**

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 2023 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.

Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	‘List rule’ guidance For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Question	Answer	Marks
1(a)	3 marks for: (elbow) flexion; (knee) extension; (hip) extension;	**3**
1(b)	4 marks for: quadriceps; hamstrings; (quadriceps) contract / shorten **OR** (quadriceps) act as the prime mover / agonist; (hamstrings) relax / lengthen **OR** (hamstrings) act as the antagonist;	**4**
1(c)(i)	1 mark per joint type, for example: (fixed) cranium / skull; (slightly movable) spine / vertebrae / ribs; Accept other appropriate sites for these types of joint.	**2**
1(c)(ii)	2 marks for: femur; tibia; Accept patella.	**2**
1(d)	1 mark for each continuum (max. 2 marks). 1 mark for each justification of a placement (max. 2 marks), for example: basic **AND** complex; complex **AND** needs coordinated movement of arms and legs; fine **AND** gross; gross **AND** uses large muscle groups to produce movements; open **AND** closed; closed **AND** repeats the same movement every time / not affected by the environment; Accept other appropriate continua and appropriate justifications.	**4**

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Question	Answer	Marks
1(e)	1 mark for aerobic. 1 mark for anaerobic. aerobic: during main part of race performer will use aerobic respiration to maintain steady pace / use for long period of time in the race / working at lower intensity; anaerobic: at the start of the race the performer will use anaerobic respiration due to high stroke rate / working at high(er) intensity / sprint for finish will use anaerobic respiration due to increase in speed;	**2**

Question	Answer	Marks
2(a)	3 marks for: fulcrum; resistance; effort;	**3**
2(b)	1 mark for effort in the middle and other two components labelled (fulcrum **AND** resistance).	**1**

Question	Answer	Marks
3(a)(i)	1 mark for: deltoid(s);	**1**
3(a)(ii)	2 marks for: concentric; muscle shortens while contracting;	**2**
3(a)(iii)	1 mark for: abduction;	**1**
3(b)(i)	1 mark for advantage. 1 mark for disadvantage, for example: advantages: may improve muscular strength / power / muscular endurance / easy to measure progress / easy to overload / may increase muscle size / targets specific muscles at each exercise; disadvantages: can be expensive due to cost of equipment / specialist equipment is needed / training may lead to injury / requires good technique to avoid injury / may need a partner / spotter to reduce risk of injury; Accept other suitable advantages and disadvantages.	**2**
3(b)(ii)	4 marks for any 4 of: 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;	**4**

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Question	Answer	Marks
4	3 marks max. for advantages. 3 marks max. for disadvantages. advantages, any 3 from: provides additional income to help pay for daily living costs; income covers costs for kit / equipment; income covers costs for travel / accommodation / competition fees; income covers costs for training facilities / medical support / sport-science support; increases time to train as do not have to work (to earn money); free merchandise / free tickets (from sponsor); increases public awareness of the individual / gives opportunity to play at a higher level / increases awareness of national selectors etc.; motivates the performer to play well; creates role models; disadvantages, any 3 from: a performer can become reliant on a particular sponsor, which could then pull out / sponsorship may be short term / any negative publicity may result in a loss of funding; some sponsorship (for example, alcohol) gives a bad image of the performer; the performer can be manipulated or exploited to suit the sponsor / the performer has additional commitments that might detract from training / sponsors may make demands; loss of control, e.g. of own lifestyle / made to act in a certain way; may have to use equipment / clothing from the sponsor that might not be the best / best suit them; the sponsor might not be able to provide sufficient funds / equipment; the athlete may not agree with the integrity of the company's business / loss of integrity; increased pressure to succeed; generous sponsorship is only available to the elite few;	**6**

Question	Answer	Marks
5	1 mark for each stage identified (max. 3 marks). 1 mark for each description of use in appropriate physical activity (max. 3 marks), for example in badminton: input; see the position of opponent on court / see the direction and speed of the shuttlecock; output; performer plays the shot (that has been decided upon); feedback; repeat output if successful, e.g. shot wins the point, then will play the same shot in the future **OR** change if unsuccessful, e.g. umpire call the shuttlecock 'out', then will change the shot in the future; Accept other appropriate descriptions.	**6**

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Question	Answer	Marks
6	4 marks for any 4 of: (compulsory) physical education lessons; provide a range of activities / sports; provide extracurricular clubs / links to external clubs; provide qualified teachers / bring outside coaches into school / speakers into school; campaigns to encourage students to try sports / involvement with national campaigns etc.; encourage participation through award schemes / house points / medals / certificates; visits to major sporting events; encourage family support for children; external publicity through school websites / newsletters etc; internal use of screens / notice boards / posters to publicise events in school / raise awareness of sports; offer a range of examination courses that provide extra opportunities to participate; provide teams / competitions / competitive matches; provide opportunities for officiating / coaching roles; provide scholarships; educate on the benefits of participating in physical activity; Accept other relevant suggestions.	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>7</td><td>5 marks for:
<table>
<tr><td>structure</td><td>function</td></tr>
<tr><td>right ventricle;</td><td>pumps blood away from the heart to the lungs</td></tr>
<tr><td>valve</td><td>prevents backflow (of blood);</td></tr>
<tr><td>pulmonary vein;</td><td>vein which brings blood to the heart from the lungs</td></tr>
<tr><td>vena cava</td><td>(vein which) brings blood to the heart from the body / (vein which) brings blood to the right atrium from the body;</td></tr>
<tr><td>aorta;</td><td>artery which takes blood away from the heart to the body</td></tr>
</table></td><td>5</td></tr>
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Question	Answer	Marks
8	2 marks for: mental (health and well-being); social (health and well-being); Accept examples of mental / social aspects.	**2**

Question	Answer	Marks
9(a)	2 marks for: 12-Minute Cooper Run; Multi-Stage Fitness Test;	**2**
9(b)	1 mark for circling: ‘The principles of overload are Frequency, Interval, Time and Type.’;	**1**

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Question	Answer	Marks
9(c)	4 marks for any 4 of: suitability of performers for different physical activities (a different distance / type of activity could be better for a performer); identifying strengths / weaknesses (identify areas of performance that need improvement); monitoring improvement / progression (after injury) / check for reversibility (ensure training is appropriate); able to make comparison 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 might show a different type of training is needed); (test as a source of) motivation;	**4**

Question	Answer	Marks
10(a)	1 mark for each risk (max. 3 marks). 1 mark for an appropriate different strategy to reduce each identified risk (max. 3 marks), for example: (real risk) drowning; (strategy) adequate supervision by referee / coach / lifeguard / suitable level of competition; (real risk) injury from opponent tackling / making physical contact with performer; (strategy) ensure players are aware of rules / following rules / make players aware of hazards / adequate supervision by referee / coach / lifeguard / suitable level of competition; (real risk) injuries from ball impact; (strategy) players should ensure as best they can that the receiving player is ready to receive a ball / water polo hats with ear guards must be worn at all times / suitable level of competition; (real risk) injury to self or others from jewellery / long nails; (strategy) all jewellery is removed / players' nails must be kept short / referees and coaches will check this before games; (real risk) dislocation of shoulder / damage to joints (from repeated action / overexertion); (strategy) appropriate level of fitness / good technique / use of warm up; Accept other appropriate risks / strategies.	**6**

Question	Answer	Marks
10(b)(i)	1 mark for each named component of fitness (max. 3 marks). 1 mark for each description of benefit in water polo (max. 3 marks). agility; able to change direction quickly to break away / to catch up to a defender quickly if they get the ball / to make a diversion for another one of your players to swim up; power; able to throw the ball hard (when shooting) / passes need to be hard / fast otherwise the defender can easily counter attack with the ball; balance; need to remain in an upright position when treading water; speed; to get from one end of the pool to the other in a very short amount of time / to swim around the defender effectively / to catch up with attacker to block the ball; flexibility; be able to reach for the ball when defending / be able to manipulate your body to be able to get the ball around the defending players when attacking; reaction time; be able to move arms up to block the ball when opponent is shooting from a short distance; muscular endurance; be able to constantly swim up and down the pool at rapid speeds / repeatedly move arms / legs; coordination; be able to catch and pass the ball accurately / be able to move arms and legs at the same time when moving through the water; strength; when shooting hard / passing the ball over a long distance / be able to resist the attacker from pushing you under the water; Accept description of other appropriate benefits.	**6**

Question	Answer	Marks
10(b)(ii)	2 marks from: age; gender; genetics; lifestyle;	**2**

Question	Answer	Marks
11(a)	2 marks for any 2 of: dry mouth; increased breathing; increased heart rate; nausea / sickness; sweaty palms; tremors / shaking; butterflies (in stomach); Accept other appropriate answers.	**2**
11(b)	1 mark for: make mistakes / poor performance / not perform to best level / increased risk of aggression / poor decision making;	**1**

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Question	Answer	Marks

11(c)	Physical activity must be appropriate.
	1 mark for explaining why the need for a low optimum level in the named physical activity.
	1 mark for explaining why the need for a high optimum level in the named physical activity.
	
	for example in rugby:
	(low level of arousal) taking a penalty requires high levels of concentration **OR** throwing the ball at a line out to maintain the direction and placement of the ball requires power to be controlled;
	
	(high level of arousal) tackling another player requires a high level of aggression **OR** pushing in the scrum needs an all-out effort / gross skill;
	
	for example in basketball:
	(low level of arousal) taking a free throw requires concentration **OR** shooting the ball requires fine skills and a low level of arousal to avoid using too much power;
	
	(high level of arousal) jumping with opposition players to rebound the ball from the backboard requires all-out effort / gross skill **OR** driving through a crowd of players to complete a lay-up requires a high level of assertion;
	
	Accept other appropriate explanations.
		2

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Question	Answer	Marks
12	1 mark for each personality type (max. 2 marks). 1 mark for each characteristic (max. 4 marks). introvert; 2 marks from: quiet; shy / reserved; prefer working by themselves / enjoy their own company / like being on their own; prefer individual sports; prefer activities that need high levels of concentration; prefer activities requiring accuracy / fine skills; dislike contact sports / low pain tolerance; high self-awareness; tend to learn by watching; tend to prefer low levels of arousal; crowd tends to tire performer; extrovert; 2 marks from: sociable / enjoy interacting with others; talkative / outgoing; prefer team sports; get bored if on own; prefer activities that need lower levels of concentration; get frustrated by intricate movements / prefer gross skills; enjoy contact sports / higher pain tolerance; tend to learn by doing; tend to prefer high levels of arousal; crowd tends to energise performer; Accept other relevant characteristics.	**6**

Question	Answer	Marks
13(a)	1 mark for 1 of: helps control anxiety / helps increase confidence / helps achieve optimal performance / identifies strengths or weaknesses / helps to create appropriate training programme / know what they are aiming for / checking progress or improvement / provides focus or direction / avoid wasting time / take own responsibility;	**1**
13(b)	1 mark for each explanation. (specific) yes **AND** because it relates to the 400 metres; (measurable) yes **AND** because the run can be timed; (agreed) yes **AND** because the runner has discussed with their coach; (time-phased) yes **AND** because they have said by the end of the season; (recorded) yes **AND** because they have written it down;	**5**

Question	Answer	Marks
14(a)	2 marks for: oxygen delivered to the blood; carbon dioxide removed from the blood;	**2**
14(b)	1 mark for each characteristic. 3 marks from: alveoli are surrounded by capillaries / good blood supply; alveoli walls are one cell thick; the walls of the alveoli contain elastic fibres; walls of the alveoli are moist; the high number of alveoli / large surface area;	**3**

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Question	Answer	Marks
15	Physical activities must be different and appropriate. 1 mark for each justification, for example: (anabolic steroids) physical activity: sprinting increases muscle mass / power / strength to allow the performer to drive out of the blocks faster / allows the performer to train for longer to improve sprint endurance; (beta blockers) physical activity: golf reduces anxiety so players will be calm and not rush movements when putting; (diuretics) physical activity: judo staying in a lower weight category can be an advantage / if a performer has taken another PED this can mask the drug;	**3**

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