

Cambridge IGCSE™

PHYSICAL EDUCATION**0413/12**

Paper 1 Theory

May/June 2025

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 May/June 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

This document consists of **20** printed pages.

PUBLISHED**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 descriptions 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.

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.

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.










Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	correct point or mark awarded
	incorrect point or mark not awarded
	benefit of the doubt given
	error carried forward applied
	point has been noted, but no credit has been given or blank page seen
	response is too vague or there is insufficient detail in response
	Incomplete answer
	linked consideration of points
	linked consideration of points

Annotation	Meaning
REP	repetition in response
A	information missing or insufficient for credit
CON	contradiction in response, mark not awarded

Question	Answer	Marks
1	1 mark for each movement. dorsiflexion; plantar flexion;	2

Question	Answer	Marks												
2(a)	1 mark for each correct response. <table border="1"> <thead> <tr> <th></th><th>bone</th><th>classification</th></tr> </thead> <tbody> <tr> <td>A</td><td>cranium;</td><td>flat;</td></tr> <tr> <td>B</td><td>carpal(s);</td><td>short;</td></tr> <tr> <td>C</td><td>femur;</td><td>long;</td></tr> </tbody> </table>		bone	classification	A	cranium;	flat;	B	carpal(s);	short;	C	femur;	long;	6
	bone	classification												
A	cranium;	flat;												
B	carpal(s);	short;												
C	femur;	long;												
2(b)(i)	1 mark for: hinge (joint);	1												
2(b)(ii)	1 mark for each type of joint named (2 marks max). 1 mark for each example (2 marks max). type of joint: fixed / immovable / fibrous joint; example: pelvis / cranium; type of joint: slightly moveable / cartilaginous; example: ribs / vertebral column (spine) / front of pelvis;	4												

Question	Answer	Marks
3(a)	<p>1 mark for each suggestion. 3 from:</p> <p>able to mentally rehearse skills needed; be mentally prepared / know they are ready for the race; can visualise performing well; increase focus / block out distractions; block out other thoughts / negative thoughts / fear of injury / fear of losing; feel motivated; more confident; keeping calm / mentally relaxed;</p> <p>Accept other appropriate suggestions.</p>	3
3(b)	<p>1 mark for each suggestion. 3 from:</p> <p>the importance of the race / running in a final; knowing that others are faster than you / competing against others who you know have a good start; knowing the importance of a good start; not being fully fit / prepared for the race / not being well trained; fear of losing / running badly / not achieving their best time / not being selected for future events / having false started before; spectators watching / noise from the crowd / race being reported by media; pressure to perform well;</p> <p>Accept other appropriate suggestions.</p>	3

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Question	Answer	Marks
3(c)(i)	<p>1 mark for each description. 2 from:</p> <p>winning a trophy; medals; certificates / badges; rewards; winning prize money; praise from a coach / family / peers / opponents / recognition that comes from winning / publicity; gaining sponsorship;</p> <p>Accept other appropriate descriptions.</p>	2
3(c)(ii)	<p>1 mark for each description. 2 from:</p> <p>not reliant on extrinsic rewards; less pressure; enjoyment from racing / sprinting / less importance placed on winning; the performer is not reliant on other people; the performer has greater control of situations / sets their own goals; able to overcome setbacks with greater ease; may train harder / try harder / wants to improve performance; develops confidence / self-belief;</p> <p>Accept other appropriate descriptions.</p>	2

Question	Answer	Marks
4	<p>1 mark for each type of guidance named (3 marks max). 1 mark for an example relevant to the named physical activity (3 marks max).</p> <p>For example in gymnastics: visual; example: the coach can demonstrate where to place their hands on the vaulting box when completing a vault / a coach can provide a performer with a video of a gymnast completing a jump on the beam; manual; example: the coach can place their hand on the small of the back of the performer to support a headspring movement; mechanical; example: the coach can use a harness when teaching how to do a somersault so that the performer can feel how to do the movement / use a landing pit to ensure they do not injure themselves when landing a complex dismount from rings;</p> <p>Accept other appropriate examples.</p>	6

Question	Answer	Marks								
5(a)	<div>1 mark for each nutrient.</div> <table><tr><th>nutrient</th><th>function</th></tr><tr><td>water;</td><td>assists in transporting food and waste products from the body and maintains body temperature.</td></tr><tr><td>protein;</td><td>repairs cells and muscle tissue, helps body cells grow.</td></tr><tr><td>fat;</td><td>provides long term energy supply.</td></tr></table>	nutrient	function	water;	assists in transporting food and waste products from the body and maintains body temperature.	protein;	repairs cells and muscle tissue, helps body cells grow.	fat;	provides long term energy supply.	3
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water;	assists in transporting food and waste products from the body and maintains body temperature.									
protein;	repairs cells and muscle tissue, helps body cells grow.									
fat;	provides long term energy supply.									
5(b)(i)	<div>1 mark for each completed part of the sentence in bold.</div> <div>Carbohydrates are broken down into GLUCOSE; which releases energy. Some carbohydrates are converted into GLYCOGEN; and stored in MUSCLES / LIVER;</div>	3								

Question	Answer	Marks
5(b)(ii)	<p>1 mark for:</p> <p>males need more energy because: males generally have greater muscle mass / generally have larger / bigger bodies;</p> <p>Accept reverse answers. Accept other appropriate suggestions.</p>	1

Question	Answer	Marks
6(a)(i)	<p>1 mark for each description.</p> <p>power: the ability to perform strength movements at speed;</p> <p>muscular endurance: the ability of muscles to work continuously without tiring / ability to perform repeated muscular contractions;</p> <p>Accept alternative wording.</p>	2
6(a)(ii)	<p>1 mark max for naming an appropriate test for muscular endurance. 3 marks max for description of the test.</p> <p>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; compare to normative data tables;</p>	4

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Question	Answer	Marks
6(b)	<p>1 mark for each appropriate component of fitness (2 marks max). 1 mark for each appropriate benefit (2 marks max).</p> <p>flexibility; benefit: the movement at the hip allows them to bring the leg over the hurdle and into the running stride / lift the legs to get over the hurdle;</p> <p>speed; benefit: when going over the hurdle the leg needs to be brought over quickly to be able to run fast between the hurdles / to win the race;</p> <p>strength; benefit: the hurdler needs to push out of the starting blocks to get a good start / push off the ground to get over the hurdle;</p> <p>balance; benefit: to ensure the performer stays upright and not fall when going over the hurdle;</p> <p>coordination; benefit: to be able to move the arms and legs at the same time to get over the hurdles / run between the hurdles;</p> <p>reaction time; benefit: can respond quickly to the start gun to get a fast start / get out of the blocks quickly;</p> <p>Accept other appropriate benefits.</p>	4

Question	Answer	Marks
7(a)	<p>1 mark for each continuum. 1 mark for each correct justification.</p> <p>fine and gross; justification: fine because the final part of the shot requires the wrist and fingers to extend to flick the ball; OR justification: gross because shooting uses large muscle groups in the arm and shoulder;</p> <p>basic and complex; justification: basic because the shooting action is based on a simple throwing action and is similar to shooting action used in other sports; OR justification: complex because the shooting action requires high levels co-ordination of both arms / high levels of concentration needed to focus on the basket;</p> <p>Accept other appropriate continua and justifications.</p>	4
7(b)	<p>1 mark for each explanation.</p> <p>input: role: seeing the distance from the basket / position of opponents / feeling the ball in the hands / hearing the team-mates / coach calling;</p> <p>output: role: the appropriate shot is attempted;</p> <p>feedback: role: if the shot is unsuccessful need to change the type of shot when in a similar situation / if shot is successful then repeat the shot;</p>	3

Question	Answer	Marks
8(a)	<p>1 mark for each suggestion.</p> <p>increase the level of participation in sport / sports available; creating facilities (to meet the demand created by the global event); increase the amount of sport played in school; increase the fitness of the (younger) population of the country; maintain facilities for elite performers; create / maintain coaching structures for performers at all levels; create accessibility to green spaces for residents; highlight how to bring about environmental change; improve areas of deprivation / housing in the city; improve economy of the country / developing commercial interests; use facilities from the global event to host future events / try to attract other global events to the city / maintain the country's high profile; use sporting facilities to hold non-sporting / commercial events; develop the use of volunteers to support the community; increase understanding of disability and sport; improved transport links for the community; continue to attract tourists / increased number of tourists;</p> <p>Accept other appropriate suggestions.</p>	4
8(b)	<p>1 mark for each description.</p> <p>home advantage; increase in national pride; increase in tourism; increase in employment; use of temporary stadia to increase the number of attendees; build new facilities; more money into the economy; improve infrastructure; raise the profile of the country / boost public image;</p> <p>Accept other appropriate descriptions.</p>	2

Question	Answer	Marks
9(a)	<p>1 mark for each description. 3 from:</p> <p>increases muscular strength; increases muscular endurance increases muscle size / mass; strengthens bones / increases bone density; increases power; increases flexibility; strengthens connective tissue; decreases the chance of injury; health benefits / reduces heart disease; increase tolerance to lactic acid;</p> <p>Accept other appropriate descriptions.</p>	3
9(b)	<p>1 mark for each principle named (3 marks max). 1 mark for each explanation (3 marks max).</p> <p>Examples could include:</p> <p>frequency; increase the number of training sessions from e.g. 2 to 3 times a week;</p> <p>intensity; lift heavier weights e.g. 30 kg to 50 kg / increase number of reps e.g. 10 to 20 / decrease rest time between exercises e.g. 30 seconds to 15 seconds;</p> <p>time; increase time when lifting weights e.g. 30 minutes to 60 minutes;</p> <p>type; uses a variety of equipment to prevent boredom e.g. use free weights / machine weights / kettle bells;</p>	6

Question	Answer	Marks
9(c)	<p>1 mark for each safety consideration described.</p> <p>the area should be kept clear / weights stored correctly; performers should wear appropriate clothing / footwear; protective clothing may be worn / gloves / lifting belt; appropriate supervision / use of a spotter; use machine weights if spotter not available; use of correct technique when lifting; warm up before lifting; lifting suitable weights e.g. not attempting to lift weights that are too heavy; check equipment in good order / ensure weights are securely fitted to bar; maintaining hydration; following gym rules; have appropriate rest periods / avoid over training;</p> <p>Accept other appropriate strategies.</p>	3

Question	Answer	Marks
10(a)	<p>1 mark for each feature of mental health (2 marks max). 1 mark for each feature of social health (2 marks max).</p> <p>mental health and well-being:</p> <p>able to cope with stress; control emotions; feeling good / self-esteem / confidence / be motivated;</p> <p>social health and well-being:</p> <p>essential human needs are met; friendship and support; having value in society; ability to mix with others;</p> <p>Accept alternative wording.</p>	4
10(b)	<p>1 mark for each explanation.</p> <p>good health means can train so fitness increases; ill health means unable to train so fitness decreases; some illnesses still allow training to happen so fitness may still increase; smoking damages the lungs so cardiovascular fitness decreases; obesity makes it harder to train so fitness decreases; poor diet may not provide enough energy for training so fitness decreases; good mental health may increase motivation to train so fitness increases;</p> <p>Accept other appropriate explanations.</p>	2

Question	Answer	Marks
11(a)	1 mark for: the volume of oxygen that can be consumed while exercising at a maximum capacity. OR the maximum volume of oxygen that can be consumed / used during exercise ; Accept alternative wording.	1
11(b)	1 mark for each factor. 3 from: age; gender; genetics; lifestyle; training;	3

Question	Answer	Marks
12(a)	1 mark for identifying muscle fibre type. 1 mark for an appropriate justification. fast twitch; justification: contract quickly / produce a large amount of force / anaerobic / can work without oxygen;	2

Question	Answer	Marks
12(b)	<p>1 mark for each description.</p> <p>3 from: reduces the risk of injury; raises muscle temperature; increases elasticity of muscles; allows joints to move over their full range / flexibility; increases speed of muscle contraction / reduces muscle response time; increases power of muscle contraction; increases blood flow to muscles; increases oxygen supply to muscles;</p> <p>Accept alternative descriptions.</p>	3

Question	Answer	Marks
13(a)(i)	<p>1 mark for each muscle identified.</p> <p>A: intercostal muscles; B: diaphragm;</p>	2
13(a)(ii)	<p>1 mark for each description of the function of each muscle.</p> <p>muscle A – intercostal muscle inhalation: contracts and lifts rib-cage up / out; exhalation: relaxes and allows the rib cage to move down / in;</p> <p>muscle B – diaphragm inhalation: contracts and flattens / moves down; exhalation: relaxes and moves into a dome position / moves up;</p>	4

Question	Answer	Marks								
13(b)	<div>1 mark for each breathing volume correctly named.</div> <table><tr><td>description</td><td>breathing volume</td></tr><tr><td>the volume of air you inhale or exhale with each breath</td><td>tidal volume;</td></tr><tr><td>the volume of air you can forcibly breathe out after maximum inhalation</td><td>vital capacity;</td></tr><tr><td>the volume of air left in your lungs after maximum exhalation</td><td>residual volume;</td></tr></table>	description	breathing volume	the volume of air you inhale or exhale with each breath	tidal volume;	the volume of air you can forcibly breathe out after maximum inhalation	vital capacity;	the volume of air left in your lungs after maximum exhalation	residual volume;	3
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Question	Answer	Marks
14(a)	<p>1 mark for each effect.</p> <p>heart size increases (hypertrophy); stroke volume increases; decrease in resting heart rate / bradycardia; increases the ability to tolerate lactic acid;</p>	3
14(b)	<p>1 mark for each part of equation.</p> <p>heart rate; × stroke volume;</p>	2