CAMBRIDGE
International Education

Cambridge IGCSE™

PHYSICAL EDUCATION **0413/12**

Paper 1 Theory **October/November 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 October/November 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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	<u>'List rule' guidance</u> 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 standard isation 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
BOD	benefit of the doubt given
ECF	error carried forward applied
SEEN	point has been noted, but no credit has been given or blank page seen
TV	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
^	information missing or insufficient for credit
CON	contradiction in response, mark not awarded

Question	Answer	Marks
1	Nutrients must be different for credit. 3 marks for: (energy) carbohydrate / protein / fat; (growth and repair) protein; (heat insulation) fat;	**3**

Question	Answer	Marks
2	3 marks for: pulse raiser; stretches; familiarisation / skill-related activities;	**3**

Question	Answer	Marks
3(a)	1 mark for each description. for example: (fluent) a performer will be able catch the ball and pivot as a single movement / smooth movement / flowing movement / without hesitation; (accurate) pass goes to intended target / a goal is scored; (coordinated) a performer can jump to catch the ball / able to use arms and legs to catch and jump at the same time; Accept other appropriate examples.	**3**

Question	Answer	Marks
3(b)	1 mark for each characteristic. 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; prefer gross skills / prefer high-energy activities; enjoy contact sports / higher pain tolerance; tend to learn by doing; tend to prefer high levels of arousal / plays well under pressure; crowd tends to energise performer; Accept other appropriate descriptions.	**2**

Question	Answer	Marks
4(a)	1 mark for explaining a benefit of each component of fitness when swimming in a front crawl race. for example: (flexibility) able to move shoulder joints fully **so** can increase pull on water / reduce water turbulence / increase speed; (muscular endurance) able to repeatedly move arms / legs without getting tired **so** can complete the race / maintain speed throughout race; (reaction time) able to quickly move off of the starting blocks when the start signal sounds **so** can swim a faster time / gain an advantage over opposition; (agility) able to change body position quickly during (tumble) turns **so** can maintain swimming speed / have a faster time; Accept other appropriate explanations.	**4**

Question	Answer	Marks
4(b)	1 mark for naming the test. 1 mark for each part of a description of the test (3 marks max.) 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; **OR** Hand Grip Dynamometer Test; 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; Accept other recognised tests of strength.	**4**

Question	Answer	Marks
4(c)	1 mark for each reason. 3 from: to identify strengths and weaknesses (areas of performance that need improvement); to make comparisons to others (enables the coach to know when a performer is ready / can take part) / check if they are fit enough compared to previous performances; use the information to monitor improvements / progression (ensure training is appropriate) / check for reversibility; to identify a baseline level / know current fitness level; informs 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; suitability of performer for different physical activities / different position in a team; potential to prevent tedium / add variety to the training schedule; Accept other appropriate reasons.	**3**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)(i)</td><td>1 mark for each difference.

2 marks from:

<table>
<tr><th>amateur</th><th></th><th>professional</th></tr>
<tr><td>take part for fun / enjoyment / health benefits / taking part is more important than the result</td><td>AND</td><td>participate seriously / competitively / winning is the main aim;</td></tr>
<tr><td>training is done during their leisure time (outside of work / studies)</td><td>AND</td><td>training and playing is their job / full-time occupation;</td></tr>
<tr><td>chooses when and where to take part</td><td>AND</td><td>perform where and when they are told to / may have a directed schedule;</td></tr>
<tr><td>traditionally upper class</td><td>AND</td><td>traditionally lower / working class;</td></tr>
<tr><td>limited access to coaching</td><td>AND</td><td>regular, high-quality coaching;</td></tr>
<tr><td>limited access to specialised facilities / equipment / sport science support</td><td>AND</td><td>full access to specialised facilities / equipment / sport science support;</td></tr>
</table>

Accept other appropriate differences.</td><td>2</td></tr>
</table>

Question	Answer	Marks
5(a)(ii)	3 marks for each explanation. for example: sponsors may provide amateurs with equipment / kit so they do not have to pay for it; amateurs can set up trust funds so they can pay for living / training expenses; amateurs can be given scholarships so they can further their education at the same time as training full-time / school or university can provide equipment / facilities; amateurs can be employed by companies but do not actually do a daily job so they may be training instead of working; amateurs may work part-time to earn money so they can pay for equipment / kit; amateurs in the armed forces are given time off so they can train and compete; may have personal money / crowdfunding / donations / gifts / family financial contributions so they can pay for equipment / kit; Accept other appropriate explanations.	**3**
5(b)	1 mark for each description of an advantage. 6 marks from: improvement of or building of stadia / facilities / ensures that the country has world class facilities; home advantage / more support from spectators / competing in familiar surroundings / used to the facilities / may raise performance levels of home competitors; increased international status and recognition / raised profile of country; increase in national pride / feel-good factors / high level of interest in the event; increase in tourism / increase number of visitors / cultural exchange; increased employment / job creation / building of facilities / staffing of facilities; economic benefit / more money being brought into the country from tourists / business opportunities or sponsorship opportunities; legacy implications / can host future international competitions / facilities can be used for community use / raise interest levels in sport / raise awareness of sport; success of home nation may increase participation levels of population; improvement of infrastructure / improvement of transportation systems; redevelopment of some areas / new housing and social facilities provided; Accept other appropriate descriptions.	**6**

Question	Answer	Marks
6(a)(i)	3 marks for: (A) scapula; (B) humerus; (C) radius;	**3**
6(a)(ii)	4 marks for: (D) trapezius; (E) deltoid; (F) latissimus dorsi; (G) gluteal(s);	**4**
6(b)	2 marks from: shape / support; protection (of vital organs); (red) blood (cell) production;	**2**
6(c)	1 mark from: join / connect muscle to bone; pull on bone when muscle contracts; withstand tension when a muscle contracts;	**1**

Question	Answer	Marks
7(a)	2 marks from: television; internet; social media; print;	**2**
7(b)	1 mark for a benefit. 1 mark for a potential problem. (benefits) can follow sport from anywhere / can follow sport whilst travelling / can get live updates / can get live commentary / phone-ins / may be cheaper than other media sources / can listen to expert analysis / may introduce people to new sports / gives information, e.g. about how or where to participate / can be entertaining when listening to commentary of games or sporting topics / may produce role models / sport guests may inspire participation; (potential problems) unable to show pictures / more difficult to visualise / may give fake news / incorrect information / may not have adequate reception / may have too many advertisements which can be boring / can lead to sedentary lifestyles / couch-potato syndrome / hinder participation / coverage may be unequal between sports / minority sports or disabled sport do not get same coverage / focus on more popular sports / hearing about injuries etc. may cause fear of activity / fear of injury / radio not suited for all sports / hard to describe some sports (quickly enough) / no access to a radio / not good if hearing impaired / cannot get replays; Accept other appropriate suggestions.	**2**

Question	Answer	Marks
8(a)(i)	1 mark for: abduction;	**1**
8(a)(ii)	1 mark for: isometric;	**1**
8(b)	1 mark for naming each force. 1 mark for each description. gravity; pulls the gymnast down / towards the ground; muscular force; muscles apply force around gymnast's joints / contract to allow the performer to move from position A to position B / muscles contract (eccentrically) to enable movement / controlled lowering of body / must overcome the effects of gravity; Accept other appropriate forces and relevant descriptions.	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>9(a)</td><td>1 mark for completing each part of the table. Must identify associative stage of learning to be given description of characteristic mark.

Accept other appropriate characteristics.

<table>
<tr><th>(stage of learning)</th><th>(description of characteristic)</th></tr>
<tr><td>(cognitive)</td><td>beginner / learning a new skill / learning basic skills / large number of mistakes / inconsistent performance / needs high level of guidance / needs high level of feedback / skills may need to be broken down into sub-routines / consciously thinks about what to do / finds it difficult to link skills / performers may find it difficult to pay attention / concentrate / movements lack coordination / often uses trial and error approach / lacks fluency / needs to work slowly and repeat actions;</td></tr>
<tr><td>associative;</td><td>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 / trying more advanced skills and techniques;</td></tr>
<tr><td>autonomous;</td><td>(skill is performed consistently to a very high standard)</td></tr>
</table>
</td><td>4</td></tr>
</table>

Question	Answer	Marks
9(b)	Physical activity must be relevant for example marks to be credited. Type of feedback must be correct for example mark to be awarded. 4 marks for: extrinsic; knowledge of results; for example in hockey: (extrinsic) the coach tells the performer that the ball is too far in front of them when trying to play an aerial pass / the crowd cheers when the performer makes a good pass / teammates congratulate the performer when they score a goal; (knowledge of results) performer can see that their pass reaches their teammate / performer knows that they have scored a goal / can compare with previous result to see if they have improved; Accept other appropriate examples.	**4**

Question	Answer	Marks
10(a)(i)	1 mark for: improves oxygen supply to muscles **so** can keep running for longer / anaerobic threshold is higher **so** can run faster for longer / event is long distance or duration **so** need good cardiovascular endurance so do not get tired; Accept other appropriate explanations.	**1**
10(a)(ii)	1 mark max. for method of training. 2 marks max. for description. continuous training; activities performed with no rest periods / long duration; usually running / cycling / rowing / swimming; max. heart rate between 60% and 80%; **OR** fartlek training; 'speed play' / fast and slow activity; over a variety of terrain; uses Borg scale for intensity; **OR** circuit training; variety of exercise stations; exercise for set time or number of repetitions; alternate muscle groups used; short rest periods; Accept other appropriate methods of training and other appropriate descriptions.	**3**
10(b)(i)	1 mark for: increases number of red blood cells / increases oxygen carried by the red blood cells;	**1**

Question	Answer	Marks
10(b)(ii)	1 mark for each description. 3 marks from: blood is removed from the body (by syringe); blood is removed 3 to 4 weeks before a competition; the blood is refrigerated / frozen and stored; 1 or 2 days before the competition the blood is thawed; the blood is reintroduced to the performer via a transfusion; blood from another person can be injected; synthetic substances such as EPO may be introduced;	**3**

Question	Answer	Marks
11(a)	6 marks for: (A) valve; prevents backflow of blood; (B) pulmonary vein(s); carries (oxygenated) blood from the lungs to the left atrium / heart; (C) left ventricle; pumps (oxygenated) blood to the aorta / body; Accept other appropriate functions of these structures.	**6**
11(b)	1 mark for: the volume of blood pumped out of the left ventricle / from the heart per minute;	**1**

Question	Answer	Marks
11(c)	1 mark for each description. 3 marks from: heart size increases / thicker walls / hypertrophy; resting pulse rate / resting heart rate reduces / bradycardia; stroke volume increases / volume of blood pumped in a single beat increases; (maximal) cardiac output increases / the volume of blood pumped in one minute increases; returns to resting heart rate more quickly; increase strength of / stronger contractions; reduction in heart disease / diseases;	**3**

Question	Answer	Marks
12	1 mark for each correct cell. (plasma) — transportation of dissolved substances; red blood cells; — (carry oxygen) (platelets) — clot the blood; white blood cells; — (protect against disease) Accept other appropriate functions.	**4**

Question	Answer	Marks
13	1 mark for each explanation. (family influences) if a member of the family takes part in a specific activity, other family members are also likely to take part / encouragement and support from parents means children are likely to take part / providing transport to activities; (social circumstances) some activities are too expensive so unlikely to take part if cannot afford to; (age) some activities have age restrictions / young children may not have the physical development to take part in certain activities / older people may choose less physically demanding activities / older people may choose activities for social benefit; Accept other appropriate explanations.	**3**

Question	Answer	Marks
14(a)	1 mark for each type of anxiety (2 marks max.) 1 mark for each description (2 marks max.) cognitive; psychological / mental symptoms (due to anxiety); somatic; physiological / physical symptoms (due to anxiety); Accept other appropriate descriptions.	**4**

Question	Answer	Marks
14(b)	2 marks from: spectators watching, e.g. coaches / sponsors / crowd; increased media attention / social media on an important race; bright lights / novel environment / performing in unusual setting / different surroundings / unfamiliar environment condition, e.g. weather / track / stadia / time of race; perceived high quality of opposition / the opposition may have beaten them earlier in the season; not being fully fit / being injured / training not being completed well before the race / not being fully prepared for performance; fear of failure / fear of performing badly during performance; pressure to win / too much focus on the outcome / winning the final / importance of race; being overtaken during a race; Accept other appropriate suggestions.	**2**

Question	Answer	Marks
15	4 marks for: increases red blood cells / increases haemoglobin / increases oxygen-carrying capacity / increases oxygen reaching the muscles / increases VO_2 max; improves performance when returns to a lower altitude; improves cardiovascular endurance / stamina / increases fatigue tolerance; places more stress on the body / harder to breathe; not possible to train at same high intensity as at lower altitude / more difficult to complete training sessions; overtraining / fatigue; can have a negative effect on immune system; can result in a loss of muscle mass;	**4**

Question	Answer	Marks
15	nausea / dizziness / altitude sickness; access to high-altitude locations is difficult / time consuming; altitude training lasts for short time and needs to be repeated / can be expensive; effect on social life; reversibility may occur; psychological effect of being away from home / homesick; increases confidence;	

Question	Answer	Marks
16(a)	2 marks for: diaphragm; intercostal muscles;	**2**
16(b)	2 marks for: minute ventilation increases **because** breathing rate increases; minute ventilation increases **because** tidal volume increases; Accept alternative correct explanations.	**2**