CAMBRIDGE
International Education

Cambridge IGCSE™

PHYSICAL EDUCATION **0413/12**

Paper 1 Theory **May/June 2026**

MARK SCHEME

Maximum Mark: 100

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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[Turn over

General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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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.

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6	<u>Calculation specific guidance</u> 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	<u>Guidance for chemical equations</u> 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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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
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

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

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Question	Answer	Marks	Guidance
1	1 mark for each: cognitive ; associative ; autonomous ;	**3**	

Question	Answer	Marks	Guidance
2(a)	1 mark for each explanation: agility: to change direction quickly **to** control the movement across the throwing circle / to get in the correct position to throw ; power: need strength **and** speed to move the arm quickly **to** throw the discus a long distance / further ; coordination: to move the feet and arms at the **same time to** create the correct throwing position (at the front of the circle) ; Accept other appropriate examples.	**3**	Answers must have a benefit to performer

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Question	Answer	Marks	Guidance
2(b)	1 mark for each description. 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 correct technique when lifting ; warm up before attempting to lift weights ; lifting suitable weights e.g. not attempting to lift weights that are too heavy ; check equipment is in good order / ensure weights are securely fitted to the bar ; maintain hydration ; follow gym rules ; have appropriate rest periods / avoid over training ; Accept other appropriate strategies.	**3**	Accept Correct form for technique Stretch for warm up Gradually increase weights for appropriate weight

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Question	Answer	Marks	Guidance
2(c)(i)	1 mark for naming an appropriate test. 3 marks max for the description of the test. name of test: 1 Rep Max Test ; description: subject attempts lift once (starting with a high weight that is achievable) ; weight is increased ; continue 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 3 minutes is allowed between lifts ; **OR** 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 ; compare to normative data ; name of test: Hand Grip Dynamometer ; description: may use dominant hand ; arm may start above the head / arm may be held by the side of the body / may have arm at 90-degree angle at the elbow / the arm must not touch the body ; apply as much grip pressure as possible / squeeze as hard as you can ; hold for approx. 3 to 5 seconds ; record the maximum reading ; (3 attempts are recorded and the highest score) compared to normative data ; Accept other recognised tests.	**4**	Tests need to be named in full for mark Compare to norms / tables / data / results TV Accept examples of exercises = variety

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Question	Answer	Marks	Guidance
2(c)(ii)	1 mark for each description. 2 from: 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) ; 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 to play?) ; informing the design of a training programme / set targets / goals (the results might show a different type of training is needed) ; to identify a base line fitness level / know current fitness level ; can prevent tedium / adds variety to training schedule ; (test as a source of) motivation ; Accept other examples	**2**	

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Question	Answer	Marks	Guidance
2(c)(iii)	1 mark for each description. heart rate increases ; breathing rate increases / more oxygen enters the lungs ; adrenalin is released into the blood ; increase tidal volume ; increase minute ventilation ; increase blood flow / oxygen supply to working muscles ; increase production / removal of carbon dioxide ; increase in lactic acid production ; stroke volume increases ; cardiac output increases ; red skin / vasodilation of blood vessels closer to the skin / more blood flows into vessels closer to the skin ; body temperature increases / increase in muscle temperature ; sweat produced / increase in sweating ; fatigue / feeling tired ; suffering from nausea / feeling light headed / feeling unwell ; increase in blood pressure ;	**4**	Accept psychological effects once e.g. mood improves / relaxed / calm

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Question	Answer	Marks	Guidance
3(a)	1 mark for each correct component (max 3 marks.). 1 mark for a correct description of the component (max 3 marks) component A: synovial fluid ; function: acts as a lubricant / allows **smooth** movement / reduces wear / reduces friction / absorbs shock ; component B: synovial membrane ; function: produces synovial fluid / lines the cavity of the joint / encloses the joint ; component C: cartilage ; function: stops the bones knocking together / acts as a shock absorber / cushions / reduces friction ;	**6**	Accept joint capsule for B Holds the structure of the joint / surrounds the joint
3(b)	1 mark for each joint named (2 marks max.). 1 mark for each movement at each joint (2 marks max per joint.). type of synovial joint at the hip: ball and socket ; movement: flexion ; extension ; abduction ; adduction ; type of synovial joint at the elbow: hinge ; movement: flexion ; extension ;	**6**	Accept flexion and extension once. Accept medial rotation/ lateral rotation / rotation / circumduction for movement at the hip; Accept pronation / supination for movement at the elbow.

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Question	Answer	Marks	Guidance
4(a)	1 mark for each description. 2 marks max for event. 2 marks max for the audience / spectators. the event: the event may need more funds than the sponsor can provide ; the event use of equipment may be limited to the sponsor`s own brand ; the event may have the name changed to reflect the sponsors involvement ; the event may be cancelled if sponsorship is withdrawn ; the event may lose control of how the event is conducted to meet the demands of the sponsor ; the image of the event is damaged if the sponsors have a bad reputation ; over pricing may cause fewer tickets sold ; the audience / spectators: tickets may be difficult to get as the sponsor may demand large numbers of corporate tickets: some spectators cannot attend due to sponsors changing the timing of events ; spectators may disagree with the image of the sponsor ; the cost of tickets to attend the event may increase due to sponsorship involvement ; spectators may have limited access / choice of food / drink / merchandise ; the viewing experience is reduced due high level of advertising / sponsor is a distraction ; Accept other disadvantages.	**4**	

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Question	Answer	Marks	Guidance
4(b)	1 mark for each. the sponsor may have a business and use it to advertise (locally) ; help to raise the image of the business (locally) ; an inexpensive way of advertising the shop / business ; wants to be seen supporting the community ; takes pride in the successes of the team ; money spent can be tax deductible ; the sponsor may increase the number of customers / profits ; Accept other appropriate advantages for the sponsor.	**3**	

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Question	Answer	Marks	Guidance
5(a)	1 mark for each named principle (2 marks max.). 1 mark for each appropriate explanation (2 marks max.). examples could include: shot put: principle: progression ; explanation: increase the weight used in training gradually / when the body has adapted to the weight the performer may increase strength ; principle: reversibility ; explanation: avoiding periods of not training / make sure when on holiday there are facilities available to maintain a level of training / if ill or injured and the intensity of training is reduced adopt a programme that limits loss of fitness ; principle: tedium ; training needs to have greater variety of activities / methods of training using weight training / plyometric training so maintains interest and prevent boredom ;	**4**	If the activity is wrong no mark for explanation
5(b)	1 mark for each appropriate description 2 from: often tired / fatigued ; overuse injuries ; muscle soreness ; loss of interest / lack of motivation / lower self-esteem ; difficult to sleep (despite being tired) ; loss of appetite ; mood swings / irritable ; prone to infections / illness ; level of performance reduces ; lack of time for a social life can affect mental health ; hormonal imbalance ;	**2**	Injury on own TV Accept examples of injury / illness if appropriate

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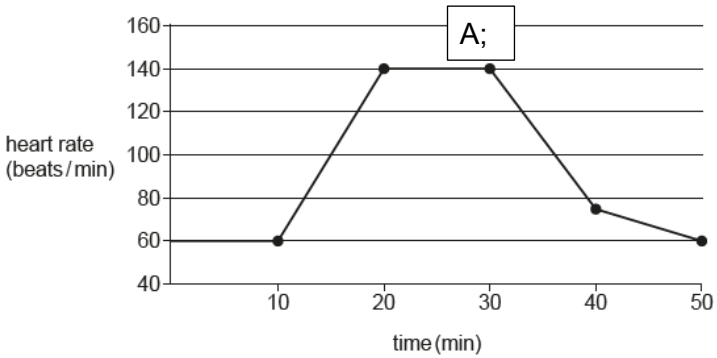
Question	Answer	Marks	Guidance
6	1 mark for each bone named (3 marks max.). 1 mark for each classification (3 marks max.). bones: A humerus ; B pelvis ; C carpals ; classification: long bone ; flat bone ; short bone ;	**6**	BOD metacarpals for carpals

Question	Answer	Marks	Guidance
7(a)(i)	1 mark for the letter being placed in appropriate position.  	**1**	
7(a)(ii)	1 mark for 140 (beats per minute) ;	**1**	
7(a)(iii)	1 mark for 20 (minutes) ;	**1**	

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Question	Answer	Marks	Guidance
7(b)	4 from: age: as a person gets older, they generally take longer to recover ; level of fitness: a fitter person may recover faster / remove lactic acid quicker so recovery is quicker ; genetics: some people inherit characteristic that allow them to recover quicker ; intensity: the harder / longer a person exercises for the longer the period of recovery ; diet / hydration: if performers do not stay hydrated so recovery is slower / if a performer does not eat the correct nutrients / at the right time will recover slower ; cool down: a cool down will speed recovery as it helps remove lactic acid ; sleep: the better the quality and quantity of sleep so the recovery time usually reduces ; gender: females who are physically fit have a greater resistance to fatigue than their male counterpart particularly at low to moderate intensities ; overtraining: can cause stress related injuries / muscles tire quickly so takes longer to recover ; environmental conditions: performing in extreme environmental conditions such a hot climate so cause a slower recovery ; taking drugs / drinking alcohol / smoking may result in a slower recovery time ; health / body weight of a performer is poor it may cause an increase in recovery time ; quality of protective equipment / running shoes puts less strain on joints which **will** aid recovery time ;	**4**	Answers must include speed up or slow down recovery in the answer Accept drugs may speed up recovery Accept injuries can take longer to recover

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Question	Answer	Marks	Guidance
8	1 mark for each appropriate suggestion. more women`s football is shown live on the television ; greater coverage of women`s football in all aspects of the media ; more girl`s football played in schools ; more (female) role models created who get a wider range of media coverage; attitudes towards girls / women playing football have generally improved / less discrimination ; football kits for women have been produced rather than needing to use kits designed for men ; more women involved in commentary on football matches ; elite clubs have established academies to allow elite female performers have the best coaches available / provides a pathway to play at the highest level ; more women are becoming qualified coaches / fewer men involved in coaching women football ; more female match officials; more teams available ; better access to facilities at all levels ; more funding made available to support women`s grass-roots football ; Accept other appropriate examples.	**5**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>9</td><td>1 mark for stating type of respiration (2 marks max.).
1 mark for each full equation (2 marks max.).
1 mark for each justification (2 marks max.).

A basketball player jumping to rebound the ball:
<table>
<tr><td>type of respiration</td><td>anaerobic;</td></tr>
<tr><td>equation</td><td>glucose → lactic acid (+ energy / ATP);</td></tr>
<tr><td>justification</td><td>Jumping requires high intensity / a quick burst of energy / explosive movement / oxygen cannot reach muscles quickly enough / requires powerful muscle contraction / last a short period of time / relies on stored energy ;</td></tr>
</table>
a cross-country runner maintaining a steady pace:
<table>
<tr><td>type of respiration</td><td>aerobic ;</td></tr>
<tr><td>equation</td><td>glucose + oxygen → carbon dioxide + water (+energy / ATP) ;</td></tr>
<tr><td>justification</td><td>Low intensity need energy over an extended period / body can use oxygen to meet energy needs / running at a steady pace allows time for glucose to be broken down by oxygen ;</td></tr>
</table></td><td>6</td><td>Anaerobic without oxygen TV
Aerobic with oxygen TV

BOD long term aerobic
BOD short term anaerobic</td></tr>
</table>

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Question	Answer	Marks	Guidance
10(a)(i)	1 mark for each example of an appropriate skill. Fine skill Examples could include moving the fingers to spin the ball when bowling **requires** small movement / muscles used ; Gross skill Examples could include a fielder throwing the ball from the boundary to the wicketkeeper **requires** large muscle groups / large movements ; Accept other appropriate examples with justification	**2**	
10(a)(ii)	1 mark for each identifying skill continua. open and closed ; basic and complex ;	**2**	Accept the discrete, serial, continuous the pacing continuum or self-paced / internal paced / externally paced; Accept simple for basic
10(b)	1 mark for each description example could include gymnastics: aesthetically pleasing: a gymnast completing a series of tumbling movements may look good to spectators / judges who awards higher marks ; coordinated: the gymnast has precise hand placements whilst swinging legs at the **same time** to perform a routine on a pommel-horse ; consistent: a gymnast lands a vault without stumbling forward most of the time ; Accept other appropriate activities and examples	**3**	Need to identify two body parts in the movement movement of limbs must be at the same time for mark

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Question	Answer	Marks	Guidance
11(a)	1 mark for: Triceps ;	**1**	
11(b)	1 mark for: first class lever ;	**1**	
11(c)	1 mark for naming each type of contraction (2 marks max.). 1 mark for each description (2 marks max.). A to B contraction: eccentric ; description: muscle contraction when the muscle lengthens ; B to C contraction: concentric ; description: muscle contraction when the muscle shortens ;	**4**	No mark if incorrect muscle is identified in the description Accept description if contraction incorrect

Question	Answer	Marks	Guidance
12(a)	1 mark for explanation: a force can be a pull or push action ; force = mass × acceleration ; (an increase / decrease in force) can cause acceleration / deceleration ;	**1**	

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Question	Answer	Marks	Guidance
12(b)	1 mark for each force named (2 marks max.). 1 mark for each explanation (2 marks max.). force: air resistance ; effect: acts to reduce the speed of the cyclist as the faster they go the greater the resistance / works against the cyclist in the opposite direction / slows the cyclist down ; force: gravity; effect: pulls the bike towards the ground / if the cyclist leans too far over on the bend on the track it will cause the cyclist to fall ; force: muscular force ; effect: the power exerted on the pedals allows the cyclist to accelerate / maintain speed / greater the muscular force the greater the speed ;	**4**	Accept weight for gravity DNA push for gravity DNA pull for air resistance Drag TV Also accept: friction Effect makes the bike stick to the track and slows the cyclist down ground reaction force: the harder the force from the tyres into the ground the greater the reaction force allowing greater speed.

Question	Answer	Marks	Guidance
13(a)	1 mark for each description. real risk: the amount of **danger** that **actually** exists in the activity / the level of risk after considering safety controls ; perceived risk: an **individual`s** subjective or personal judgement about the **dangers** of an activity / an individual`s view of risk / what someone may think is dangerous, others may not ; Accept alternative wording.	**2**	

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Question	Answer	Marks	Guidance
13(b)	1 mark for each risk. 2 marks max for each activity. swimming in a pool: real risk: drowning / infections from poor quality water / eye infections from too much chlorine / people bumping into you while swimming / hitting head on pool wall ; perceived risk: fear of drowning / going underwater / fear that the floats will not prevent you going underwater / fear that they will not be seen by a lifeguard if in trouble in the water / fear that they will not be able to reach the side of the pool / fear that if the pool is crowded they may bump into another swimmer and pushed underwater ; rock climbing on a wall: real risk: falling / hit by falling objects / wall too difficult for ability of climber / equipment malfunction ; perceived risk: fear of the rope breaking / fear they will not be able to reach the hand / foot holds / fear that the foothold / hand hold will support weight / fear they will fall off the wall / fear of getting stuck on the wall / not able to move on the wall ; Accept other appropriate risks	**4**	Risks must be different Description of a perceived risk need to indicate fear / worry / thoughts of danger Climbing relates to a climbing wall not mountain / rock faces
13(c)	2 marks for: cognitive ; somatic ;	**2**	

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Question	Answer	Marks	Guidance
14(a)	1 mark for naming each principle (2 marks max.). 1 mark for describing how the target meets the named principle (2 marks max.). principle: specific ; description: the target is linked to 100 m which is the event the performer is training for / the time they want to improve is specific ; principle: measurable ; description: the run can be timed using a stop-watch / timing devices ; principle: realistic; description: the runner has just started so likely to make good progress initially / coach thinks the target is within the runner`s ability to improve with training; principle: time-phased ; description: the target identifies by the end of the season / indicates when goal is met ; principle: exciting ; description: as the performer has just started training, they are likely to find working towards the target interesting / motivating ;	**4**	If principle is wrong no mark for description
14(b)	1 mark for each example. 2 from: rewards ; prizes ; certificates ; medals / trophies ; praise from the coach ; public recognition of the performers progress ; Accept other appropriate examples.	**2**	

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