CAMBRIDGE
International Education

Cambridge IGCSE™

PHYSICAL EDUCATION **0413/11**

Paper 1 Theory **May/June 2024**

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 2024 series for most Cambridge IGCSE, Cambridge International A and AS Level and Cambridge Pre-U 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 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.

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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	1 mark for each type of media identified. radio / podcast; internet; social media; print;	**2**

Question	Answer	Marks
2(a)	1 mark for each chamber. Top to bottom on table. left ventricle; right atrium; right ventricle;	**3**
2(b)	1 mark for each description. prevents blood flowing backwards; ensures blood flows in one direction / determines the pathway of blood through the heart; allows blood to enter / leave heart chambers; regulates the flow of blood / ensure blood flows at the correct speed;	**2**

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Question	Answer	Marks
3(a)	1 mark for each component (3 marks max.). 1 mark for each explanation of a benefit (3 marks max.). Answers could include: agility; (benefit) able to change direction at speed while under control going down a steep slope / able to avoid obstacles / other performers at speed; balance (static / dynamic); (benefit) to stay upright when changing direction at speed / does not fall down when performing tricks; coordination; (benefit) allows the performer to move arms and legs at the same time to maintain direction / position on the board; flexibility; (benefit) the performer will be able to stretch forward with the arms to hold the tip of the snowboard / allows the performer to get into a low squat position to get into a better aerodynamic positions / flexibility at the hips allows the performer to get into a lower body position to absorb the impact when landing from a jump; power; (benefit) enables the performer to push off the ground to achieve high jumps / perform tricks; reaction time; (benefit) responds to ground conditions to enable the performer to manoeuvre around dips in the ground quickly / able to quickly avoid obstacles / other performers that <u>suddenly</u> appear / able to start quickly from the gate; speed; (benefit) able to go faster than an opponent to win a race / gain momentum to jump; strength; (benefit) the performer needs to be able to absorb the impact of a jump / push on the ground / maintain body position on landing / turning; Accept other appropriate examples.	**6**

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Question	Answer	Marks
3(b)	1 mark for an appropriate risk (2 marks max.). 1 mark for an appropriate strategy (2 marks max.). injury due to equipment failure; (strategy) ensure bindings and boots are fitted correctly / check for damage to equipment before starting; injury due to falling / collision; (strategy) wear safety helmet / goggles / body protection pads / only snowboard on slopes that are within your ability / stay within marked boundaries / follow instructions from signs on the slope / always check for other performers coming down the slope before starting / be aware of the blind spots / be aware of accepted right of way of other performers when on the slope / reduce speed / appropriate level of technique; injury due to extreme weather / hyperthermia / sunburn / sun blindness; (strategy) wear gloves / wear layered / thermal of clothing / wear sunglasses / lip balm / sun cream; Accept other appropriate risks and strategies.	**4**

Question	Answer	Marks
4(a)	1 mark for each part of the equation (2 marks max.). glucose; → lactic acid; **AND** 1 mark for: anaerobic / without oxygen being present;	**3**

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Question	Answer	Marks
4(b)	1 mark for each named factor (2 marks max.). 1 mark for each appropriate explanation (2 marks max.). exercise intensity; the harder / longer / faster a sprinter runs, for the longer the period of recovery; age; as the sprinter gets older, they generally take longer to recover than a younger person; sleep; a person who has better quality and quantity of sleep usually recovers quicker; overtraining; if a performer is overtraining, they will tire more quickly / may result in a stress injury which take longer to recover; genetics; genetics may result in a quicker recovery due to inherited characteristics from their parents; environment; performing in extreme environmental conditions may cause a performer to recover slower; diet; if a performer does not eat the appropriate nutrients / at the right time recovery will be slower; hydration; poor hydration / dehydration will slow recovery; drugs; if a performer takes drugs / drinks alcohol excessively / smokes this may result in slower recovery; health; if the general health / body weight of a performer is poor it may increase recovery time; fitness; a fitter person may recover faster (have less lactic acid in muscles / may be able to remove lactic acid quicker);	**4**

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Question	Answer	Marks
4(b)	equipment; the quality of equipment such as running shoes / protective equipment may reduce the impact on joints and reduce time to recover; cool down; the use of a cool down / equipment will speed up recovery; Accept reverse answers.	

Question	Answer	Marks
5(a)	1 mark for identifying each stage of learning (2 marks max.). 1 mark for describing an appropriate characteristic of each stage (2 marks max.). Photograph A cognitive; large number of mistakes / techniques are not fully developed / movements lack fluidity / slow and uncoordinated movements / skills need to be broken down into sub-routines and learnt separately / performers might find it difficult to pay attention / concentrate / high level of coaching / feedback required / low success rate / misinterprets information / often uses trial and error approach; Photograph B autonomous; can complete skills almost without thinking / little conscious control / performs skills naturally / skills can be completed with little effort / few mistakes / the skill can be adapted to gain a required outcome / decision making is quick / requires few clues and signals from the environment / able to identify mistakes and bring about the required changes / evaluate their own performance / performers with a high level of accuracy / can concentrate on higher level strategies / tactics / options;	**4**

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Question	Answer	Marks
5(b)	1 mark for each type of guidance identified (2 marks max.). 1 mark for each example (2 marks max.). visual; demonstration by coach / watch video / watch live performance; mechanical; use of a tennis ball machine; verbal; giving instructions / discussion / questions;	**4**
5(c)(i)	1 mark for: the performer can only focus on a limited number of stimuli at one time / the limited amount of information that can be processed by a performer`s sensory system at any given time;	**1**
5(c)(ii)	2 from: a coach should use only small amounts of information / feedback at a time; break skills down into subroutines / parts; introduce new aspects of the skill slowly; coach needs to ensure performer understands the important parts of a skill / when to ignore unimportant information; check if the performer understands the information before starting to practice skill; provide / repeat a demonstration so the performer understands the context of the skill; use basic / simple language rather that technical terms; allow opportunity / time to practice a skill before moving onto the next stage; Accept other appropriate answers.	**2**

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Question	Answer	Marks
6(a)	1 mark for each benefit. (pulse raiser) increases heart rate **to** increase the flow of blood and oxygen to muscles / increases body temperature **to** prepare the body for an activity; (stretches) increase flexibility / increase joint mobility **to** reduce the possibility of muscle injury; increase the speed of contraction and relaxation of muscles **to** reduce muscle stiffness; (familiarisation / skill-related activities) practice key skills **to** get the performer used to the playing conditions / prepare for the activity;	**3**
6(b)	1 mark for each suggestion. helps reduce oxygen debt; remove lactic acid from muscles; allows heart rate / blood flow to reduce **gradually** / keeps heart rate elevated; allows body temperature to reduce **gradually**; allows breathing rate to reduce **gradually;** prevents blood pooling; reduces muscle soreness; provides time for the performer to reflect on performance; helps transition to less physical activities; allows the performer to return to a calm state; Accept other appropriate suggestions.	**2**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>7(a)</td><td>1 mark for each answer (answers in bold).

<table>
<tr><td>joint</td><td>type of synovial joint</td><td>movement</td><td>agonist muscle</td></tr>
<tr><td>shoulder</td><td>ball and socket;</td><td>flexion / abduction;</td><td>deltoid</td></tr>
<tr><td>knee</td><td>hinge;</td><td>extension</td><td>quadricep(s) group;</td></tr>
<tr><td>ankle</td><td>hinge joint</td><td>plantar flexion;</td><td>gastrocnemius;</td></tr>
</table></td><td>6</td></tr>
<tr><td>7(b)</td><td>1 mark for identifying each joint type (2 marks max.).
1 mark for each example (2 marks max.).

(joint type) fixed / immovable / fibrous;

(example) cranium;

(joint type) slightly movable / cartilaginous;

(example) between the sternum and the ribs / between the joint at the front of the pelvis / between the vertebrae to form the spinal column;

Accept other appropriate examples.</td><td>4</td></tr>
</table>

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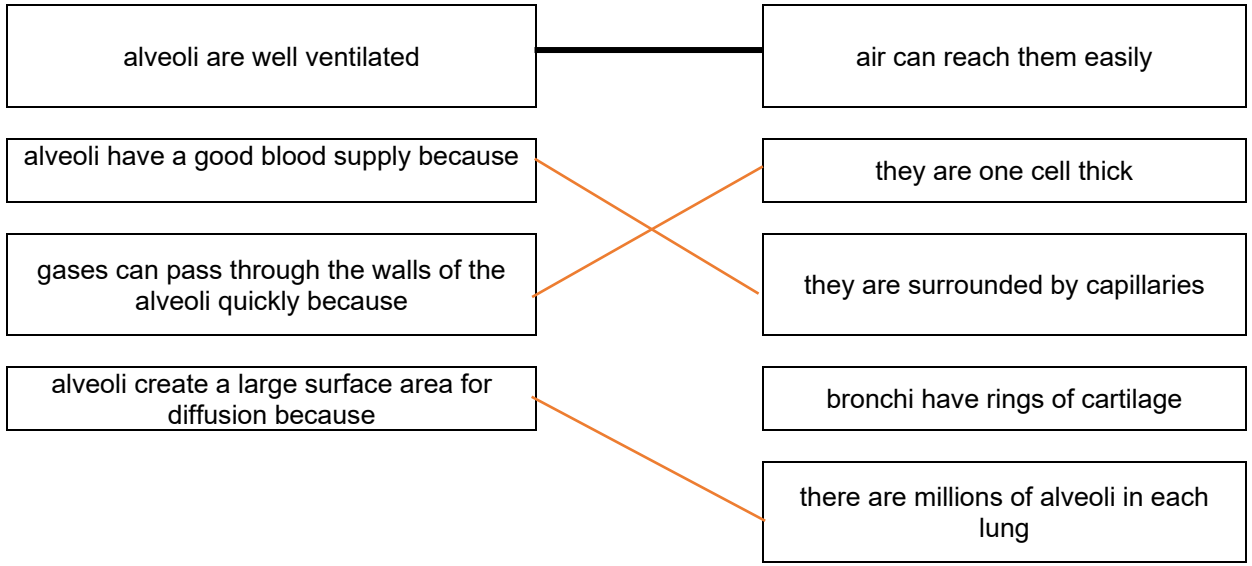
Question	Answer	Marks
8	1 mark for each suggestion. providing legislation to make it illegal to discriminate against women; relaxed dress code for females / development in sports clothing for females; increase in the level of media coverage / exposure of female sports; increase in the number of female coaches; increase the number of females presenting sports programmes; increase in female role models; increase the number of females in senior positions of sports organisations; provide equal prize money for female performers; use of campaigns to encourage young girls to take part in sports / provide information of opportunities for girls to participate in sports / physical activities; increase opportunities / access for females / provide mixed gender sports / female-only activities / increase funding for female activities; better education about the role of women in society; provision for childcare / creche; Accept other appropriate suggestions.	**5**

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Question	Answer	Marks
9	1 mark for naming each principle of training (2 marks max.). 1 mark for an appropriate application linked to circuit training (2 marks max.). Example could include: specificity; the stations can be either skill-related or fitness-related but must relate to the sport the performer participates in; progression; increasing the amount of time at each station when the performer has reached a certain target / level; overload; the length of time spent on each station is increased / the rest time between stations is reduced / the number of reps of each exercise is increased; reversibility; stop doing the circuit training programme; tedium; regularly change the activity of the stations of the circuit to avoid the performers from becoming bored / demotivated; Accept other appropriate applications.	**4**

Question	Answer	Marks
10(a)	1 mark for each structure. **A** trachea; **B** bronchi / bronchus; **C** bronchiole;	**3**

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Question	Answer	Marks
10(b)	1 mark for each correct line placement.  	**3**
10(c)(i)	1 mark for each factor with an appropriate unit of measurement. **tidal volume** measured in **millilitres / litres;** **number of breaths** measured **per minute**;	**2**
10(c)(ii)	1 mark for the description. 1 mark for the effect. (residual volume) the volume of air left in the lungs after breathing out **maximally**; (effect) no change;	**2**

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Question	Answer	Marks
11	1 mark for each skill (2 marks max.). 1 mark for an appropriate justification for each skill (2 marks max.). Examples for basketball could include: (basic skill) running down the court on a fast break; (justification) can be used in a number of different sports / does not require high levels of coordination / concentration / generally learnt quickly / does not have to be practiced a great deal; (complex skill) completing a lay-up shot; (justification) the skill has to be learnt / requires practice / requires a high level of coordination / requires a high level of concentration / is specific to the activity / can take a great deal of time before a performer is able to achieve a high level of success / performer needs to know when to apply the skill; Accept other examples.	**4**

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Question	Answer	Marks
12(a)	1 mark for an appropriate Performance Enhancing Drug (PED). 1 mark for an appropriate benefit. (track cyclist) 1 from: anabolic steroids; increases strength / power / muscle mass which will allow greater speed / speeds recovery; stimulants; increases pain threshold allows the performer to push himself harder at the end of the race / responds quickly to the movements of other cyclists to avoid being blocked in; diuretics; masks other PED`s being used; beta blockers; calms the performer before a big event; (100–metre sprinter) 1 from: stimulants; allows the sprinter to respond to the starters gun and get a quick start to the race; anabolic steroids; increases the push out of the blocks to get a powerful start / increase strength to be able to maintain maximum speed for longer / speeds recovery; diuretics; masks other PED`s being used; beta blockers; calms the performer before a big race;	**6**

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Question	Answer	Marks
12(a)	(trampolinist) 1 from: anabolic steroids; provides strength to gain power and enable height on the bounce / speeds up recovery / can maintain height throughout the sequence; diuretics; allows the performer to lose / maintain weight to ensure they can complete complex movements with ease / masks other PED`s being used; beta blockers; calms the performer before a big competition; stimulants; increase alertness when performing a routine;	
12(b)	1 mark for each appropriate suggestion. to make sure sports / competitions are not devalued; to make sure competitions are fair / not an unfair advantage; to protect / maintain good health of performers / duty of care to performers; to prevent performers from being pressurised by coaches to take drugs; to prevent a poor image of the sport; prevent performers from breaking the law as the use of some drugs are illegal; Accept other appropriate suggestions.	**2**
12(c)	1 mark for each type of test. urine test; blood test; hair fibre test; nail tissue test; Accept other appropriate tests.	**2**

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Question	Answer	Marks
13(a)	2 marks for. force = **mass;** × **acceleration;**	**2**
13(b)	1 mark for each suggestion. make the body position aerodynamic on the bike; aerodynamic shaped helmet; skin tight clothing; shoe covers; aerodynamic bike design; Accept other appropriate examples.	**2**
14(a)(i)	1 mark for: the volume of oxygen that can be **used / consumed (**while exercising) at a **maximum** capacity; or the **maximum** volume of oxygen that can be **used / consumed** (while exercising); Accept alternative wording.	**1**

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Question	Answer	Marks
14(a)(ii)	1 mark for naming a factor. 1 mark for an appropriate explanation. age; oxygen uptake is generally at its highest in young adults (18–25) but reduces with age; gender; values of VO_2max. are typically higher in men than women due to the larger amount of blood pumped / larger stroke volume / larger heart / larger lungs; genetics; initial values of VO_2 max. are inherited; lifestyle; smoking / a sedentary lifestyle / taking drugs / drinking will negatively impact VO_2 max.; Accept other appropriate explanations.	**2**
14(b)	1 mark for each danger identified. overuse injury; fatigue; reduced performance; loss of motivation; sleep problems; lack of appetite; depression; Accept other appropriate dangers.	**2**

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Question	Answer	Marks
15(a)(i)	1 mark for each description. (concentric contraction) contraction where the muscle shortens; (eccentric contraction) contraction where the muscle lengthens; (isometric contraction) the muscles contract but stay the same length;	**3**
15(a)(ii)	1 mark for each description. (concentric contraction) A to B / during the upward phase of the bicep curl; (eccentric contraction) B to C / during the downward phase of the bicep curl; (isometric contraction) A / B / C / when the weights are held in a stationary position;	**3**
15(b)	1 mark for description of tendon. 1 mark for description of movement. tendon attaches muscle to bone; the tendon pulls on the radius to create flexion / the tendon pulls on the ulna to create extension;	**2**

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