CAMBRIDGE
International Education

Cambridge IGCSE™

PHYSICAL EDUCATION **0413/13**

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(a)(i)	1 mark for: haemoglobin;	**1**
1(a)(ii)	1 mark for each component of blood (2 marks max.). 1 mark for each function (2 marks max.). 2 from: white blood cells; protect against disease / fight pathogens / bacteria / infections; plasma; transport medium / carries other cells and nutrients / plays a role in maintaining blood pressure / helps maintain body temperature / affects the viscosity of blood; platelets; clot the blood / form a scab;	**4**
1(b)	3 marks for: (arteries) carry blood **away** from the heart; (veins) carry blood **towards** the heart; (capillaries) allow gaseous exchange to occur / allow nutrients to pass into the body cells / allow waste products to be removed from the cells;	**3**

Question	Answer	Marks
2(a)	3 marks for: muscle attachment for movement; protection of vital organs; red blood cell production;	**3**

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Question	Answer	Marks
2(b)(i)	3 marks for: A fibula; B tibia; C talus;	**3**
2(b)(ii)	No mark for activity. 1 mark for each type of movement (2 marks max.). 1 mark for each appropriate example (2 marks max.). For example in gymnastics: plantarflexion; pointing the toes during a handstand; dorsiflexion; landing after a vault;	**4**
2(c)	1 mark for each named muscle. 2 marks for correct explanation. 4 marks for: gastrocnemius; tibialis anterior; for plantarflexion tibialis anterior relaxes / lengthens OR tibialis anterior acts as the antagonist; for plantarflexion gastrocnemius contracts / shortens OR gastrocnemius acts as the prime mover / agonist; OR for dorsiflexion gastrocnemius relaxes / lengthens OR gastrocnemius acts as the antagonist; for dorsiflexion tibialis anterior contracts / shortens OR tibialis anterior acts as the prime mover / agonist;	**4**

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Question	Answer	Marks
3(a)	1 mark for: time spent away from work / free from obligations;	**1**
3(b)	3 marks for: (peer influences) a person is likely to take part in activities that their friends are involved in; (facilities) the facilities that are close to where a person lives means that they are more likely to use them than travel to other facilities / allows younger people to be more independent in their participation / the sports that are on offer locally makes it more likely to participate in those sports; (social circumstances) the cost of certain sports / equipment may prevent a performer from taking part / some activities / sports clubs may still have a gender bias restricting participation; Accept other appropriate descriptions.	**3**
3(c)	3 marks from: (wider media coverage) people are more aware of activities available / see different activities on media and encourages participation / increases popularity and knowledge of sports and activities by covering matches and events / promotes exercise and a healthy lifestyle / promotional health campaigns / interactive simulation games and apps encourage an interest in sports which may lead to greater participation; (improvements in health care) people living longer so need activities to participate in / improved health and fitness so able to participate for longer / doctor exercise referrals mean more activities are needed / increased health awareness so will participate to stay healthy; (improvements in travel methods) people are able to access more remote / wider variety of facilities / able to transport equipment / less time spent travelling; Accept alternative descriptions.	**3**

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Question	Answer	Marks
4(a)	4 marks for: For example: (power) able to jump higher to beat opponent to a rebound / able to pass the ball quickly to a teammate without it being intercepted / able to pass / shoot from a long distance; (speed) able to run from one end of the court to the other during a fast break / able to chase back after an opponent when beaten; (coordination) able to change hands when dribbling the ball / able to catch a ball when passed; (balance) able to control the landing following a lay-up shot without falling over; Accept alternative explanations.	**4**
4(b)	1 mark for naming the test. 3 marks max. for description. Multi-Stage Fitness Test; performer must run in time with the bleeps on a CD / eq.; 20-metre / measured shuttles are performed; time between bleeps reduces as test progresses / bleeps get closer together / the subject must run faster; subject runs until they can no longer keep up with the bleeps; the level achieved and the number of shuttles performed within the level are recorded; scores are compared to standardised normative data; OR 12-Minute Cooper Run Test; subject runs / walks as far as possible; test duration is 12 minutes; a measured course is used, e.g. with cones placed at regular intervals to help identify the exact distance covered / measured laps; calculate the distance covered; the distance covered is compared to standardised normative data;	**4**

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Question	Answer	Marks
4(c)	1 mark for a description of a skill. 1 mark for a description of an ability. (skill) learnt / practised / sport-specific / more easily adapted / changed; (ability) innate / you are born with them / genetic / enduring / harder to change;	**2**

Question	Answer	Marks
5(a)	1 mark for each appropriate example. 4 marks from: For example: use of electronic starting blocks to identify false start; use of electronic timing / photo finish to ensure more accurate timing; use of video analysis to improve technique; use of sports medicine / physiotherapy / ice baths to improve recovery times; use of clothing to reduce air resistance / regulate body temperature; use of prosthetic running blade to be able to run; use of lightweight spiked footwear to increase grip on the track; Accept other examples.	**4**
5(b)(i)	1 mark for each side of equation. glucose; → lactic acid (+ energy);	**2**
5(b)(ii)	2 marks from: short duration / short distance / not enough time to take in the amount of oxygen required; high intensity / explosive / fast movements / powerful movements / energy is needed quicker than it can be formed by the aerobic system;	**2**

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Question	Answer	Marks
6	1 mark for each named principle. 1 mark for each appropriate justification. specific; because the target is about the performance of the 400-metre runner; measurable; because the runner can be timed using a stopwatch; agreed; because the runner has discussed with their coach; realistic; because running 0.5 seconds faster is possible (after training); time-phased; because they want to reach the goal by the end of the season; exciting; because the runner has set himself a challenge; recorded; because the goal has been written down;	**6**

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Question	Answer	Marks
7(a)	2 marks from: increases muscle size; increases muscle strength / power / muscular endurance; easy to show progression / easy to overload (by adding weights); reduces body fat; strengthens bone / reduces osteoporosis; target different muscle groups; Accept other advantages.	**2**
7(b)	1 mark for describing how each principle can be applied. (frequency) the performer will increase the number of times they train / increase the number of sessions / add an extra weight training session to the training week; (intensity) increase the weight / increase the number of reps in each set / increase intensity to above 60% of 1 Rep Max; (time) increase the amount of time spent training so a session lasts for longer; (type) change the type of activity to avoid tedium by having sessions that include resistance training / HIIT training / circuit training / plyometric training / kettlebells / free weights;	**4**

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Question	Answer	Marks
7(c)	2 marks for: overuse injury; fatigue; reduced performance; loss of motivation; sleep problems; lack of appetite; depression; Accept other appropriate effects.	**2**

Question	Answer	Marks
8(a)	1 mark for: (perceived risk) takes into account an individual's subjective / personal judgement / fear **AND** (real risk) is the amount of danger that actually exists; Accept alternative wording.	**1**
8(b)	1 mark for identifying a risk. 1 mark for a strategy to reduce the risk. 4 marks from: (picture A) risk – weight dropping on the performer / weights too heavy; strategy – ensure adequate supervision is present / use of spotter / use of safety bar; (picture B) risk – tripping over weights; strategy – make sure weights are stored in a safe place; Accept other appropriate answers.	**4**

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Question	Answer	Marks
9(a)	2 marks for any 2 of: television; internet; social media; print; radio;	**2**
9(b)	1 mark for each advantage. 1 mark for each disadvantage. advantages (2 marks from): increased exposure / fame / popularity; attract sponsorship; receive money so does not have to work to earn a living; receive free equipment / use of facilities; become a (positive) role model; attract high-quality coaches; watch media to improve technique / tactics; positive comments can improve mental health / motivate / increase confidence / increase self-esteem; disadvantages (2 marks from): loss of privacy; abuse their status; overexposure can lead to reduced interest in the performer; negative news / poor results / poor performance can be highlighted / damage reputation / damage image; negative comments can damage mental health / demotivate / decrease confidence / decrease self-esteem; opponents may watch performances on media to study weaknesses; increased pressure knowing that many people are watching / following; Accept other appropriate answers.	**4**

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Question	Answer	Marks
10(a)	1 mark for each named characteristic. 1 mark for each appropriate explanation. 3 from: fluent; the player is able to dribble the ball without hesitation or stumbling; aesthetically pleasing; the player looks good to the spectator / coach; consistent; the player is able to control the ball well at all times; accurate; the player is able to dribble the ball into the space away from the opponents / able to pass the ball directly to a teammate; goal directed; if the player loses the ball, he will be determined to get the ball back; coordinated; the player is able to control the ball with both feet; Accept other appropriate explanations.	**6**

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Question	Answer	Marks
10(b)	No mark for naming skill. 1 mark for each correct application at each stage. For example - passing in football. (input) the player sees the position of his opponents / teammates; (decision-making) the player has two teammates available to pass the ball to and chooses one of them; (output) the player passes the ball to his teammate; (feedback) if pass is successful, repeat the action next time / if pass is unsuccessful, change the action next time;	**4**

Question	Answer	Marks
11(a)	1 mark for each example. for example in rugby: (push) pushing opponent in the scrum; (pull) grabbing the opponent's shirt when making a tackle to pull them back;	**2**
11(b)	2 marks from: force is equal to mass multiplied by acceleration; greater the force, the greater the acceleration; bigger the mass, the more force needed to accelerate it; mass generally stays the same;	**2**

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Question	Answer	Marks
12(a)	3 marks for: physical (well-being); mental (well-being); social (well-being);	**3**
12(b)	1 mark for each explanation. 2 marks for: 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; Accept other appropriate explanations.	**2**

Question	Answer	Marks
13(a)	3 marks for: A – rib / rib cage; B – bronchus / bronchii; C – bronchiole;	**3**
13(b)	1 mark for each function. (trachea) allows air to move in and out of the lungs; (alveoli) allows gaseous exchange to take place; (diaphragm) increases chest volume during inspiration / decreases chest volume during expiration; Allow other appropriate descriptions.	**3**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>13(c)</td><td>
<table>
<tr><td>breathing volume</td><td>description</td><td>effect of exercise</td></tr>
<tr><td>tidal volume</td><td>the volume of air breathed in / out with each breath</td><td>increases;</td></tr>
<tr><td>vital capacity</td><td>the maximum volume of air you can breathe out following maximum inhalation;</td><td>no change</td></tr>
<tr><td>minute ventilation</td><td>the volume of air that you breath in or out in one minute;</td><td>increases</td></tr>
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</td><td>3</td></tr>
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