CAMBRIDGE
International Education

Cambridge International AS Level

SPORT & PHYSICAL EDUCATION **8386/11**

Paper 1 Theory **May/June 2025**

MARK SCHEME

Maximum Mark: 70

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the May/June 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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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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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
	information missing or insufficient for credit
	contradiction in response, mark not awarded
	benefit of the doubt given
	error carried forward applied
	point has been noted, but no credit has been given or blank page seen
	response is too vague or there is insufficient detail in response
	linked consideration of points

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Annotation	Meaning
	linked consideration of points
REP	repetition in response

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Question	Answer	Marks
1(a)	6 marks for any 6 of: 1 gymnast needs to **change** their moment of inertia; 2 which is resistance of the body to change state of angular motion; 3 moment of inertia is affected by the distribution of mass from the axis of rotation; 4 to **increase** angular velocity a gymnast **decreases** moment of inertia; 5 (decrease moment of inertia or increase angular velocity) by tucking body / bringing arms / legs towards axis of rotation; 6 to **decrease** angular velocity a gymnast **increases** moment of inertia; 7 (increase moment of inertia or reduce angular velocity) by extending body / opening out / straightening out by taking arms / legs away from axis of rotation; 8 angular momentum remains constant (during rotation) **OR** angular momentum = angular velocity × moment of inertia;	**6**
1(b)	1 positive reinforcement **AND** negative reinforcement; 2 (positive) e.g. coach says well done / use of rewards / self-satisfaction (when skill done correctly); 3 (negative) e.g. the removal of criticism / unpleasant stimulus / coach stops shouting (when skill done correctly); Answers must identify a type of reinforcement to gain credit for the example of it.	**3**

Question	Answer	Marks
2(a)	1 (fibula) A; 2 (talus) C;	**2**
2(b)	hinge;	**1**
2(c)	tibialis anterior;	**1**

Question	Answer	Marks
3(a)(i)	(reaction time) 0.15 (seconds);	**1**
3(a)(ii)	(response time) 0.40 / 0.4 (seconds);	**1**
3(a)(iii)	(movement time) 0.25 (seconds);	**1**

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Question	Answer	Marks
3(b)	3 marks for any 3 of: 1 (psychological refractory period) increases reaction time; 2 one / first stimulus must be processed before others can be processed **OR** performer can only deal with one stimulus at a time; 3 causes a **delay** in processing a second stimulus; 4 this is called the single-channel hypothesis;	**3**
3(c)	3 marks for any 3 of: 1 a series of subroutines; 2 a generalised series of movements; 3 a set of nerve impulses to the muscles; 4 completed in correct order;	**3**
3(d)	5 marks for any 5 of: 1 use of reinforcement **OR** use of praise **OR** use of rewards; 2 improve performer's selective attention / focus on specific cues; 3 teach use of mental rehearsal **OR** encourage use of imagery / visualisation; 4 improve performer's (temporal / spatial) anticipation; 5 ensure performer is at optimum arousal levels **OR** ensure performer is at zone of optimal functioning; 6 ensure performer is motivated; 7 increase intensity of the stimulus; 8 use positive transfer of learning / link to past experiences; 9 make the motor programme meaningful / enjoyable / fun / interesting / unique; 10 use of chunking **OR** use of chaining; Accept other relevant strategies.	**5**

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Question	Answer	Marks
4(a)(i)	1 10.20; 2 metres per second; Accept other appropriate units.	**2**
4(a)(ii)	(velocity) 1 is a vector; 2 has direction;	**2**
4(a)(iii)	(displacement) is the shortest / straight-line route from start to finish / between two points; Accept other appropriate descriptions.	**1**
4(b)	5 marks for 5 of: 1 respiratory control centre receives information from receptors; (sub-max. 2 marks for points 2 to 5) 2 chemoreceptors **detect** increased acidity / carbon dioxide / lactic acid **OR** chemoreceptors **detect** decrease in pH; 3 thermoreceptors **detect** increase in temperature; 4 mechanoreceptors / proprioceptors **detect** increase in movement; 5 stretch receptors **detect** increased stretching of lungs; 6 Hering–Breuer reflex prevents over-stretching of lungs; 7 respiratory control centre increases frequency of nerve impulses **to** diaphragm / external intercostals; 8 … **via** phrenic / intercostal / sympathetic nerve / sympathetic nervous system; 9 … and **to** sternocleidomastoids / pectoralis minor / scalenes / internal intercostals / rectus abdominis; 10 release of adrenaline; 11 (respiratory control centre) increases the **rate** of contraction of respiratory muscles;	**5**

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Question	Answer	Marks
4(c)	6 marks for 6 of: advantages (sub-max. 4 marks) 1 see better quality performances; 2 better atmosphere **OR** more exciting / enjoyable experience; 3 use of multiple camera angles / big screens / replays / better view; 4 spectators more informed; 5 watching fairer competition; 6 accurate results; 7 rapid results / quicker decisions; 8 easier access to stadiums; 9 improved stadium design / more comfortable seats; 10 spectators can use own technology; 11 support for disabled spectators; disadvantages (sub-max. 4 marks) 12 can become a distraction; 13 could be reduced atmosphere / fewer primary spectators (because it is on television); 14 reduced social interaction between spectators; 15 reduced amount of information **OR** technical issues; 16 disappointment due to disqualification of a favourite; 17 safeguarding issues / objections to being caught on film; Accept other suitable examples of the advantages and disadvantages of technology. Allow appropriate opposites.	**6**

Question	Answer	Marks
5(a)(i)	1 (working) stroke volume × heart rate **OR** 50 × 100; 2 (answer) 5000; 3 (appropriate units) millilitres per minute; Credit other units if they are appropriate for a correct answer, e.g. 5 litres per minute.	**3**

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Question	Answer	Marks
5(a)(ii)	1 (a number within the range) 95–120; 2 (a number within the range) 160–200;	**2**
5(b)	1 pulmonary vein; 2 aorta;	**2**
5(c)	5 marks for any 5 of: 1 sinoatrial node generates an (electrical) impulse; 2 this moves (through cardiac tissue) as a **wave of excitation**; 3 the impulse passes through the atria; **OR** the impulse causes atrial systole / atrial contraction; 4 the impulse passes on to the atrioventricular node; 5 the impulse passes down bundle of His; 6 which **delays** ventricular systole / ventricular contraction; 7 Purkyne tissue spreads the impulse (upwards) through the ventricles; 8 causing ventricular systole / ventricular contraction;	**5**

Question	Answer	Marks
6(a)	2 marks for any 2 of: 1 at the top of the performance pyramid / having reached excellence; 2 at national / international / Olympic standard; 3 professional / paid; 4 achieved by few people;	**2**

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Question	Answer	Marks
6(b)	4 marks for any 4 of: 1 sufficient funding; 2 high-quality facilities; 3 high-quality coaches; 4 high-level competition; 5 science support; 6 medicine; 7 biomechanics; 8 rehabilitation; 9 nutrition; 10 psychology; Accept other appropriate types of provision.	**4**
6(c)	4 marks for any 4 of: 1 banned **OR** loss of career; 2 fined; 3 loss of income; 4 loss of sponsorship; 5 addiction / over-reliance; 6 (physical health problems) heart diseases / liver damage / kidney damage / cancer; 7 (mental health problems) depression / loss of self-esteem; 8 aggression; 9 named and shamed / ostracised / loss of reputation; 10 loss of titles / name deleted from medal table; 11 hormonal imbalances; Accept other appropriate negative consequences.	**4**

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Question	Answer	Marks
7(a)	1 (vital capacity) E; 2 (residual volume) D; 3 (expiratory reserve volume) C;	**3**
7(b)	1 (A) decreases; 2 (B) increases;	**2**

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