



Cambridge International AS & A Level

PHYSICAL EDUCATION

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Paper 1

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MARK SCHEME

Maximum Mark: 90

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 2023 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

This document consists of **14** printed pages.

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 descriptors 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 '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.

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.

Question	Answer	Marks
1(a)	2 marks for: 1 (extension) moving (upper) arm downwards / backwards; 2 (elevation) raising / 'shrugging' of shoulder;	2
1(b)	2 marks for: 1 (biceps femoris) knee flexion / hip extension; 2 (teres minor) shoulder rotation;	2
1(c)	3 marks for: 1 concentric AND muscle shortens during upward phase / A to B; 2 eccentric AND muscle lengthens during downward phase / B to A; 3 isometric AND muscle stays same length during stationary phase / at A / at B;	3
1(d)	4 marks for: 1 extension; 2 rectus femoris / vastus medialis / vastus lateralis / vastus intermedius; 3 flexion; 4 iliopsoas / sartorius / rectus femoris;	4
1(e)(i)	3 marks for any 3 of: 1 release of adrenaline / epinephrine; 2 (before exercise) anticipatory rise; 3 from adrenal gland; 4 (during exercise) sympathetic pathway / impulses; 5 release noradrenaline / norepinephrine; 6 acts on sinoatrial node;	3
1(e)(ii)	2 marks for: 1 volume of blood leaving heart / (left) ventricle per minute OR stroke volume \times heart rate; 2 $\text{ml} / \text{cm}^3 / \text{dm}^3 / \text{litres per minute}$;	2

Question	Answer	Marks
1(e)(iii)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> controlled by sympathetic nervous system; vasomotor centre / medulla; (vasodilation) is the widening of arterioles / blood vessels OR increased flow / more blood / oxygen to working muscles; vasoconstriction is the narrowing of arterioles / blood vessels OR reduces blood flow to inactive muscles / organs; role of pre-capillary sphincters; role of (rings of) smooth muscle; 	4
1(f)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> deoxygenated blood leaves the right ventricle; via semilunar / pulmonary valve; via pulmonary artery to lungs / alveoli; oxygenated blood travels to left atrium; via the pulmonary veins; 	3
1(g)(i)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> reduced concentration gradient / diffusion gradient of oxygen; in alveoli / lungs / blood; less oxygen combines with haemoglobin / forms oxyhaemoglobin; reduces / lower concentration / diffusion gradient of oxygen at muscles / less oxygen diffuses into muscle / myoglobin; causes increase in frequency OR depth of breathing / ventilation rate / breathe faster OR deeper OR increase in tidal volume; 	3
1(g)(ii)	<p>4 marks for:</p> <ol style="list-style-type: none"> (external intercostal muscles) contract to lift ribs up / out OR increase volume of thoracic / chest cavity (during inspiration); (sternocleidomastoid muscles) contract to lift ribs OR increase volume of thoracic / chest cavity (during inspiration); (internal intercostal muscles) contract to pull ribs downwards / inwards OR decrease volume of thoracic / chest cavity (during expiration); (abdominal muscles) contract to force diaphragm up OR decrease volume of thoracic / chest cavity (during expiration); 	4

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Question	Answer	Marks
2(a)(i)	2 marks for: 1 innate; 2 underlying;	2
2(a)(ii)	2 marks for: 1 gross motor ability involves large muscle groups in the movement AND gross movement, e.g. strength / speed / stamina / power / flexibility; 2 psychomotor ability involves both cognitive / thinking / information processing AND action / movement, e.g. reaction time / balance / hand–eye coordination / aiming; Accept other suitable examples.	2
2(b)	3 marks for: 1 (positive reinforcement), e.g. praise for completing a gymnastic skill correctly / reward for swimming a certain distance / crowd cheering after scoring a football goal; 2 (negative reinforcement), e.g. removing the negative stimulus or removing the negative feedback to a football player OR the coach stops her criticism of a hockey player when she performs a good pass; 3 (punishment), e.g. laps of the pitch to someone who has not performed well in a rugby practice session OR criticising a trampolinist for not performing a somersault well;	3

Question	Answer	Marks
2(c)(i)	<p>4 marks for 4 of:</p> <p>Max. 3 marks if no practical example is used.</p> <ol style="list-style-type: none"> 1 is a generalised series of movements; 2 is a series of subroutines; 3 suitable example of movements / subroutines; 4 is a set of neural commands / nerve impulses to muscles; 5 is completed in correct order; 6 is brought about by making one decision OR first movement initiates (whole) motor programme OR initiated by memory trace; 7 is established by rehearsal / practice / training; 8 is grooved / autonomous / well-learned / easily recalled; 9 is stored in long-term memory; 10 is run from short-term memory; 	4
2(c)(ii)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 involves ballistic / fast actions / closed skills; 2 no time for feedback / there is no feedback; 3 performer relies on motor programmes to be run; 4 single decision is made / no adjustments; 5 no conscious control / run autonomously; 6 it explains why performer reacts in specific way to a situation; 7 memory trace starts the movement; 	3

Question	Answer	Marks
2(d)	<p>5 marks for any 5 of:</p> <ol style="list-style-type: none"> 1 limited capacity / 7 ± 2 items / 5–9 items; 2 limited duration / 30–60 seconds; 3 working memory / involves decision making; 4 information enters from short-term sensory store / STSS; 5 only selectively attended items / information enter; 6 transfers / encodes meaningful information to long-term memory; 7 if information is not rehearsed / reinforced then lost; 8 retrieves information from long-term memory; 9 (STM) initiates memory trace / schema / runs motor programme; 10 sends motor programme to effector mechanism; 	5
2(e)(i)	<p>2 marks for any 2 of:</p> <ol style="list-style-type: none"> 1 may improve response time / improved objective result; 2 may have more time to complete a movement / action; 3 quicker decision making / may give you more time to make decisions / understand the situation quicker; 4 to get an advantage over an opponent; 5 to give yourself more time to prepare for the next movement; 6 to avoid injury; 	2
2(e)(ii)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 relevant / specific practice / reacting to stimuli / grooving the response / strengthen S/R bond; 2 mental rehearsal / imagery / visualisation; 3 improve selective attention / focus on the action / early cue identification; 4 warm up; 5 anticipation of stimulus / concentrate on preliminary movements before actual movement; 6 increase arousal / motivation / use PEDs / drugs / supplements; 7 improve fitness; 8 improve movement time / reaction time; 	3

Question	Answer	Marks
2(f)	<p>2 marks for:</p> <p>1 (negative) where learning of a skill hinders the learning of another skill;</p> <p>2 (proactive) practising one skill can help the performance of another skill in the future / yet to be learned OR a skill learned in the past influences one being learned now / in the present;</p>	2
2(g)(i)	<p>1 mark for:</p> <p>1 intrinsic motivation is the drive from within;</p>	1
2(g)(ii)	<p>3 marks for any 3 of:</p> <p>1 use with extrinsic motivation / rewards / reinforcement;</p> <p>2 make training enjoyable / fun / variable / competitive;</p> <p>3 set realistic goals / targets;</p> <p>4 ensure success;</p> <p>5 highlight personal success (within team) / progress / avoid comparisons with other performers / attribution retraining;</p> <p>6 promote autonomy / self-determination / promote self-reliance;</p>	3

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Question	Answer	Marks
3(a)(i)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 voluntary / choice / no moral obligation; 2 activity done in leisure time; 3 non-serious; 4 for fun / enjoyment; 5 may be social / with friends; 6 standard of skills is not important OR no training needed OR low physical demand; 7 limited organisational structure / no need for a coach; 8 often non-competitive / less emphasis on winners / losers; 9 (often) no officials / self-officiated; 10 (simplified / adapted) rules; 11 (may be played) for fitness / health benefits / stress reducing; 	3
3(a)(ii)	<p>4 marks for any 4 of:</p> <p>sport is / has:</p> <ol style="list-style-type: none"> 1 stricter / more complex rules; 2 more competitive; 3 higher structure / higher level of organisation / leagues / cups; 4 more expectation of pre-determined boundaries / playing area / venue / standardised facilities; 5 time constraints / set time / scheduled; 6 more standardised equipment; 7 more specific kit; 8 officials / referees / judges; 9 more tactics / strategies / specific skills used; 10 may have extrinsic rewards / winners and losers; 11 involves more training / practices / commitment / physical effort; <p>Responses must have direct or implied comparison between sport and play.</p>	4

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Question	Answer	Marks
3(b)(i)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 increase in national prestige / pride / feel-good factor / improve morale; 2 advertisement for country OR to create a shop-window effect; 3 to provide more / better sporting facilities OR to create a positive legacy; 4 demand / expectation from population for national success; 5 confirmation of political superiority OR for political popularity; 6 allows / enables individuals to succeed / reach potential / goals; 7 encourage participation / to create role models; 8 to improve health / less strain on the health service; 9 to create employment opportunities; 10 reduces crime OR for social control; 	4
3(b)(ii)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 central / lottery / governmental funding; 2 sponsorship / endorsements; 3 appearance money; 4 prize money; 5 grants / scholarships / NGB funding; 6 parental support; 7 part-time employment / self-funded; 8 employed by military / state; 9 professional contracts; <p>Accept other suitable ways that elite performers may be funded.</p>	3

Question	Answer	Marks
3(b)(iii)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 national governing body sport-specific initiatives; 2 government / state initiatives; 3 use of specialist schools / colleges / universities; 4 specialist training venues / high-quality equipment / high-quality facilities / centres of excellence; 5 high-quality coaching structure; 6 high levels of organisation of the sport; 7 structured levels of competition; 8 scientific support structures / sports science / fitness / strength and conditioning / biomechanics support; 9 medical support structures / physiotherapy support; 10 other support structures / nutritional / psychological / media training / performance analysis; 	4
3(c)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 fasting / religious dietary requirements; 2 attitudes to gender; 3 discrimination / prejudice against the religion; 4 religious attitudes to certain sports; 5 dress code restrictions; 6 religious expectations on certain days / at certain times; 7 emphasis on academic studies; 8 emphasis on work commitments / employment; 9 emphasis that home and family responsibilities should take precedence; 10 lack of media coverage / role models to inspire specific religion; <p>Accept other suitable suggestions.</p>	4

Question	Answer	Marks
3(d)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 'golden triangle'; 2 sport gains money from the media and / or sponsorship; 3 sport gains exposure in the media / can gain in popularity; 4 exposure of sport in the media promotes participation; 5 if the sport is not covered by the media then no sponsorship OR when sponsor pulls out competitions may stop; 6 performers become media stars / high status / role model; 7 sponsorship provides money for the sport / performers; 8 sponsors invest because sport will have extensive (television) exposure; 9 sponsors brand image is advertised / brand exposure; 10 sponsors may sell more products / gain more profit; 11 sponsor can be positively or negatively attached to a sport; 12 media covers popular sports for more viewers; 13 media makes more money from subscriptions; 14 media educates the public on rules, etc.; 15 media may report deviant behaviour; 16 media coverage of controversial events may reduce sponsorship; <p>Accept other relevant explanations.</p>	4
3(e)	<p>4 marks for 4 of:</p> <ol style="list-style-type: none"> 1 testing / more random / out of competition testing; 2 use of biological passports / whereabouts system; 3 financial penalties / removal of prizes / medals; 4 name and shame drug cheats; 5 make supplying / taking drugs criminal offence; 6 increased finance into research / technology; 7 use of positive / clean role models; 8 education programmes / provide a list of banned drugs; 9 work together with other organisations to deal with the problem; 10 allow use of drugs; <p>Accept other suitable suggestions.</p>	4