



## Cambridge International AS & A Level

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PHYSICAL EDUCATION

9396/13

Paper 1

May/June 2022

MARK SCHEME

Maximum Mark: 90

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**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 2022 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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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	<p><u>'List rule' guidance</u></p> <p>For questions that require <i>n</i> responses (e.g. State <b>two</b> reasons ...):</p> <ul style="list-style-type: none"> <li>• The response should be read as continuous prose, even when numbered answer spaces are provided.</li> <li>• Any response marked <i>ignore</i> in the mark scheme should not count towards <i>n</i>.</li> <li>• Incorrect responses should not be awarded credit but will still count towards <i>n</i>.</li> <li>• Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should <b>not</b> 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.</li> <li>• Non-contradictory responses after the first <i>n</i> responses may be ignored even if they include incorrect science.</li> </ul>

**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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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(a)	3 marks for:  1 (supination) turn wrist so palm faces upwards; 2 (dorsiflexion) movement at ankle so that toes move towards tibia / shin / angle decreases; 3 (flexion) raising arm upwards in front / in sagittal plane / from the anatomical position;	<b>3</b>
1(b)	3 marks for any 3 of:  1 few fibres per (motor) neurone; 2 small (motor) neurone size; 3 has / produces low strength / less force / less powerful contractions; 4 high levels of myoglobin; 5 high capillary density; 6 limited glycolytic capacity / glycogen stores; 7 high density of mitochondria; 8 high levels of fat stores / triglycerides; 9 low myosin ATPase levels; 10 high concentrations of oxidative enzymes; 11 relatively small muscle fibre <b>diameter</b> ; 12 high aerobic capacity / low anaerobic capacity;	<b>3</b>
1(c)(i)	4 marks for:  1 flexion; 2 iliopsoas / sartorius; 3 extension; 4 triceps brachii;	<b>4</b>
1(c)(ii)	2 marks for:  1 pelvis <b>AND</b> femur; 2 humerus <b>AND</b> radius <b>AND</b> ulna;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(d)(i)	3 marks for:  1 A 70; 2 B 150; 3 C millilitres per minute / cm <sup>3</sup> per min;	<b>3</b>
1(d)(ii)	5 marks for any 5 of:  1 chemoreceptors <b>detect</b> ; 2 increased CO <sub>2</sub> / lactic acid levels / decreased pH; 3 impulses to / controlled by CCC / cardiac (control) centre; 4 in medulla; 5 sympathetic nervous system / sympathetic nerve impulses; 6 act on sinoatrial / SA node / SAN; 7 increasing heart rate / stroke volume; 8 (nor)adrenaline released;	<b>5</b>
1(e)	2 marks for any 2 of:  changes caused by: 1 force of contractions of heart; 2 changes in total cross-sectional area of blood vessels; 3 increased peripheral resistance / friction of blood with blood vessel walls; 4 changes in blood viscosity / hydration;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(f)	<p>6 marks for 6 of:</p> <p>at rest sub-max. 3 marks:</p> <ol style="list-style-type: none"> <li>1 <b>external intercostals</b> contract when breathing in;</li> <li>2 the ribs move upwards / outwards;</li> <li>3 increasing volume / reducing pressure of thoracic / chest cavity;</li> <li>4 <b>external intercostals</b> relax to permit breathing out;</li> <li>5 <b>internal intercostals</b> unused / resting / relaxed;</li> </ol> <p>during exercise sub-max. 3 marks:</p> <ol style="list-style-type: none"> <li>6 <b>external intercostals</b> contract more forcefully;</li> <li>7 greater increase in volume / greater decrease in pressure of thoracic / chest cavity;</li> <li>8 <b>internal intercostals</b> contract;</li> <li>9 forcing ribs inwards / downwards;</li> </ol>	<b>6</b>
1(g)	<p>2 marks for any 2 of:</p> <ol style="list-style-type: none"> <li>1 moist alveoli surface;</li> <li>2 short diffusion pathway;</li> <li>3 large numbers of capillaries surround the alveoli;</li> <li>4 elastic fibres in the lungs / alveoli walls;</li> <li>5 surfactant maintains surface tension;</li> <li>6 narrow diameter of capillaries;</li> </ol>	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(a)	3 marks for:  1 goal directed; 2 follows technical model; 3 fluent;  Accept other appropriate characteristics.	<b>3</b>
2(b)(i)	2 marks for any 2 of:  1 innate; 2 underlying; 3 enduring;	<b>2</b>
2(b)(ii)	2 marks for:  1 (gross motor ability) running / catching / throwing / jumping; 2 (psychomotor ability) balance / hand–eye coordination / reaction time / agility;  Accept other suitable examples.	<b>2</b>
2(c)(i)	4 marks for any 4 of:  1 develop / strengthen the <b>stimulus–response</b> bond / <b>S/R</b> bond; 2 involves trial and error learning; 3 <b>shaping</b> behaviour; 4 change / modify the environment; 5 (positive) <b>reinforcement</b> creates positive feelings / praise from coach / reward / observing target being hit; 6 <b>negative reinforcement</b> withdrawal of criticism / adverse stimulus / coach stops shouting; 7 <b>punishment / annoyance</b> weakens the S/R bond / removes unwanted behaviour; 8 physical / mental preparedness strengthens S/R bond;	<b>4</b>

Question	Answer	Marks
2(c)(ii)	<p>4 marks for 4 of:</p> <p>advantages sub-max. 2 marks</p> <ol style="list-style-type: none"> <li>1 performers develop (specific) skills through <b>repeated</b> practice;</li> <li>2 coach can control the training session / develop weak skills;</li> <li>3 specific game-related practices can be developed;</li> <li>4 modifying the environment helps success to be achieved;</li> <li>5 use of reinforcement increases motivation;</li> </ol> <p>disadvantages sub-max. 2 marks</p> <ol style="list-style-type: none"> <li>6 difficult to modify / adjust skills to new situations;</li> <li>7 performer unable to develop own strategies / reliant on coach;</li> <li>8 performer does not understand relationship between S/R bond / subroutines;</li> <li>9 too much punishment may reduce motivation;</li> <li>10 may be time consuming;</li> </ol>	<b>4</b>
2(d)	<p>4 marks for:</p> <ol style="list-style-type: none"> <li>1 (attention) concentrating / focus on relevant cues / what is important / use significant model;</li> <li>2 (retention) performer <b>capable</b> of remembering what to copy / storing image in the LTM;</li> <li>3 (motor reproduction) performer <b>capable</b> of repeating / performing movements shown by the model;</li> <li>4 (motivation) having the drive / need / willingness to learn / practise the skill;</li> </ol>	<b>4</b>
2(e)	<p>2 marks for:</p> <ol style="list-style-type: none"> <li>1 initial / environmental conditions;</li> <li>2 response specifications;</li> </ol>	<b>2</b>
2(f)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> <li>1 extrinsic <b>AND</b> needs feedback from coach / unable to use intrinsic;</li> <li>2 terminal <b>AND</b> avoids information overload / cannot cope with concurrent;</li> <li>3 positive <b>AND</b> encourages high motivation / unable to deal with negative / criticism;</li> <li>4 knowledge of results <b>AND</b> does not understand requirements of skill / unable to use knowledge of performance;</li> </ol> <p>Accept other appropriately justified types of feedback.</p>	<b>3</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(g)	2 marks for:  1 (bilateral) skill used by one limb affecting the learning / performance of a skill on a limb on the other side of the body; 2 (proactive) skill that affects the learning / performance of a skill yet to be learned;	<b>2</b>
2(h)(i)	2 marks for:  Any <b>two</b> of the following: certificates / praise / feedback / applause / records / personal best / prizes / trophies / money;  Accept other suitable examples.	<b>2</b>
2(h)(ii)	2 marks for any 2 of:  1 intrinsic encourages persistence / continued participation; 2 overuse of extrinsic motivation may <b>undermine</b> intrinsic motivation; 3 performer may become <b>over-reliant</b> on extrinsic rewards / only participate if given praise; 4 intrinsic motivation develops confidence / autonomy / self-control; 5 excessive extrinsic motivation may lead to deviancy / cheating;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
3(a)(i)	2 marks for any 2 of:  1 appreciation of the natural environment / observe nature / flora and fauna; 2 respect for the countryside / environment / conservation / reduce pollution; 3 health benefits; 4 for enjoyment / fun / mental benefits; 5 voluntary / choice; 6 has social aspects / friendships / group participation; 7 during free / leisure time; 8 non-competitive; 9 self-regulated; 10 limited organisation / structure; 11 escapism / freedom;	<b>2</b>
3(a)(ii)	4 marks for:  real risk 1 objective danger / actual <b>danger</b> from activity / cannot be controlled; 2 e.g. fall from the rock / capsize / rock fall / flooding / adverse weather / strong tides / currents / rapids;  perceived risk 3 subjective danger / <b>think</b> of danger / fear of danger; 4 e.g. fear of falling / scared of heights / worry about drowning;	<b>4</b>
3(b)(i)	2 marks for any 2 of:  1 involves performers who have reached excellence / best / top performer; 2 this relates to national and international standards; 3 top of the performance pyramid / few performers involved at this level; 4 predominantly professional / full-time performers; 5 popular with media;	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
3(b)(ii)	<p>4 marks for any 4 of:</p> <p>Must relate to a named country.</p> <ol style="list-style-type: none"> <li>1 described government initiatives;</li> <li>2 described governing body / sport-specific initiatives;</li> <li>3 described selection procedures / talent-identification programme / talent scouts;</li> <li>4 described specialist schools / colleges / universities;</li> <li>5 described specialist training venues / centres of excellence / academies;</li> <li>6 described elite coaching structure;</li> <li>7 described role of development programmes;</li> <li>8 described progression between schools / clubs / local / regional / national levels;</li> <li>9 described support structures / sports science / medical / dietary;</li> <li>10 described method of funding, e.g. national lottery / state funding / scholarships;</li> </ol>	<b>4</b>
3(c)(i)	<p>5 marks for any 5 of:</p> <ol style="list-style-type: none"> <li>1 raise awareness through advertising / publicity / taster days;</li> <li>2 make access to facilities affordable / more clubs / more teams / more facilities;</li> <li>3 develop inner-city schemes / deprived / rural areas;</li> <li>4 develop more qualified coaches / coaching resources;</li> <li>5 use sport personalities / role models;</li> <li>6 focus on target groups / groups with lower participation;</li> <li>7 develop award schemes / use of extrinsic motivation;</li> <li>8 develop modified / adapted sports;</li> <li>9 improve links within schools / school–club links;</li> <li>10 change attitudes / prejudice / discrimination within sport;</li> <li>11 change structural barriers, e.g. membership restrictions;</li> <li>12 named initiative to increase participation, e.g. ‘midnight basketball’ / ‘this girl can’;</li> </ol>	<b>5</b>

Question	Answer	Marks
3(c)(ii)	<p>4 marks for 4 of:</p> <ol style="list-style-type: none"> <li>1 improved (mental / social / physical) health / fitness of the community;</li> <li>2 reduced cost of health care;</li> <li>3 creates / improves sporting infrastructure;</li> <li>4 social control / involvement of individuals in worthwhile activity;</li> <li>5 lowers crime rate;</li> <li>6 improves pride in community / image;</li> <li>7 improves integration within community;</li> <li>8 produces more elite performers / role models;</li> <li>9 provides employment opportunities / more income;</li> </ol>	<b>4</b>
3(d)	<p>5 marks for 5 of:</p> <p>advantages of sponsorship sub-max. 3 marks</p> <ol style="list-style-type: none"> <li>1 sponsorship provides income;</li> <li>2 which can be used to employ coaches / buy kit / equipment / pay entry fees to competitions / technology / scientific support;</li> <li>3 some sponsors provide kit / equipment / improved facilities for players;</li> <li>4 sponsorship allows professionalism / full-time training / better results / performances;</li> <li>5 sponsorship gives performers / clubs financial security / stability;</li> <li>6 increased performer awareness / image;</li> </ol> <p>disadvantages of sponsorship sub-max. 3 marks</p> <ol style="list-style-type: none"> <li>7 some products / tobacco / alcohol / fast foods are unhealthy / reflect badly on performer;</li> <li>8 pressure of sponsors' demands / performers restricted to using / wearing certain products;</li> <li>9 sponsor can easily remove sponsorship from performer;</li> <li>10 too much focus on winning / increased links with deviance;</li> <li>11 not all performers / sports equally sponsored / only big sports get sponsorship / minority sports 'miss out';</li> <li>12 performer can cause loss of sponsorship because of poor performances / due to disgrace / injury / relegation;</li> </ol>	<b>5</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
3(e)	4 marks for any 4 of:  1 penalties <b>during</b> the event, e.g. bookings / free kicks / sin bin; 2 (individual) penalties <b>after</b> the event, e.g. bans / fines; 3 clubs / <b>teams</b> fined / points deducted; 4 matches played behind closed doors <b>OR</b> spectators banned from watching; 5 fair-play awards / place in major event based on disciplinary record; 6 fair-play charters / code of conduct / education / campaigns; 7 drug testing / biological passport; 8 positive role models; 9 use of technology / video replays / TMO / 3rd umpire;	<b>4</b>