



## Cambridge International AS & A Level

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PHYSICAL EDUCATION

9396/13

Paper 1

October/November 2020

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 October/November 2020 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 **15** 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.

Question	Answer	Marks
1(a)	3 marks for:  1 (concentric) muscle shortens; 2 (eccentric) muscle lengthens; 3 (isometric) muscle stays same length;  <i>Accept equivalent explanations.</i>	<b>3</b>
1(b)	6 marks for:  1 hinge; 2 extension; 3 triceps brachii; 4 ball and socket; 5 (horizontal) adduction / flexion; 6 (anterior) deltoid / pectoralis major;	<b>6</b>
1(c)	5 marks for any 5 of:  1 high speed of contraction; 2 large (motor) neurone size; 3 large muscle fibre <b>diameter</b> ; 4 low resistance to fatigue; 5 high force production; 6 low numbers of mitochondria; 7 low capillary density; 8 low oxidative / low aerobic / high anaerobic <b>capacity</b> ; 9 low myoglobin content; 10 high glycolytic content / glycogen stores; 11 high myosin ATP levels; 12 high PC stores; 13 low triglyceride stores; 14 narrow Z-line thickness; 15 large number of fibres per (motor) neurone;	<b>5</b>

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Question	Answer	Marks
1(d)(i)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> <li>1 enters <u>right atrium</u> <b>during</b> diastole / relaxation / resting;</li> <li>2 pressure <b>forces</b> <u>tricuspid / AV valve</u> open / closes to prevent back flow;</li> <li>3 to <u>right ventricle</u> <b>during</b> diastole / relaxation;</li> <li>4 (right) <u>atria contracts</u> / atrial systole <b>AND</b> blood forced out of atria / into ventricles;</li> <li>5 (right) <u>ventricle contracts</u> / systole <b>AND</b> blood forced out of ventricle;</li> <li>6 through <u>pulmonary valve / semilunar valve</u> <b>which</b> prevents backflow / pressure forces valve open;</li> <li>7 to <u>pulmonary artery</u> <b>which</b> transports <u>deoxygenated</u> blood to the lungs;</li> </ol> <p><i>Explanations must be made in context.</i></p>	<b>4</b>
1(d)(ii)	<p>5 marks for any 5 of:</p> <ol style="list-style-type: none"> <li>1 both axes labelled <b>OR</b> units shown – heart rate <b>OR</b> bpm and time <b>OR</b> minutes;</li> <li>2 initial steep increase in heart rate from 100 bpm at beginning of run;</li> <li>3 peak in HR shown before / at approx. 1 min / HR peaks at end of run;</li> <li>4 peak HR between 150–205 bpm;</li> <li>5 recovery line – last 10 mins;</li> <li>6 recovery line is initially rapid, then slows;</li> </ol>	<b>5</b>
1(e)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> <li>1 sympathetic nervous system / vasomotor control centre / in the medulla;</li> <li>2 vasodilation / widening of arterioles to working muscles;</li> <li>3 action of smooth muscle / pre-capillary sphincters;</li> <li>4 vasoconstriction / narrowing of arterioles to non-essential organs;</li> </ol>	<b>4</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(f)	3 marks for any 3 of:  1 alveoli have a large surface area; 2 large blood supply / large capillary network / surface area; 3 alveoli / capillaries have thin walls / semi-permeable membrane / walls are one cell thick; 4 short distance between alveoli and capillaries; 5 layer of moisture; 6 narrow capillaries / slower blood flow / longer transit time; 7 alveoli have surfactant;	<b>3</b>
2(a)	3 marks for:  1 (are goal directed), e.g. tennis player pre-plans / intends / aims serve to land close to line / known result / outcome; 2 (follow a technical model), e.g. cricket batsman uses a learned / textbook / copied / repeatable drive / stroke; 3 (are fluent), e.g. gymnast shows quick / smooth / flowing moves in floor routine;  <i>Descriptions must relate to skillful performance.</i>	<b>3</b>
2(b)	3 marks for:  1 (innate) inherited / genetic / born with; 2 (underlying) abilities needed / required for / underpin / certain skills / building blocks of skill; 3 (enduring) stable / unchanging / long lasting / constant;	<b>3</b>
2(c)(i)	2 marks for:  1 response is closely related / linked to a stimulus <b>OR</b> learning to respond to a certain stimulus <b>OR</b> relationship between (specific) response and (specific) stimulus; 2 relevant example identifying both stimulus and response, e.g. a forehand in tennis performed (response) when ball is on the appropriate side of the body (stimulus);	<b>2</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(c)(ii)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> <li>1 positive reinforcement / praise / encouragement / rewards;</li> <li>2 negative reinforcement / removing criticism;</li> <li>3 punishment when response is incorrect (weakens the bond but) can result in strengthening a previously formed bond;</li> <li>4 repetition / drills / trial and error / intense training (Thorndike's) law of exercise;</li> <li>5 teach as a whole to help this understanding / insight learning;</li> <li>6 giving a 'satisfier' rather than an 'annoyer' / (Thorndike's) law of effect;</li> <li>7 physical / mental preparation / (Thorndike's) law of readiness;</li> <li>8 feedback on performance / information to correct errors;</li> <li>9 manipulate environment;</li> <li>10 shaping behaviour;</li> </ol>	<b>4</b>
2(d)(i)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> <li>1 to motivate / drive / encourage;</li> <li>2 to reinforce / strengthen the S–R bond / tell what they are doing correctly;</li> <li>3 to correct / give information on errors / mistakes / improve skills / adjust motor programmes;</li> <li>4 to give knowledge on technique / knowledge of results / knowledge of performance;</li> </ol>	<b>3</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>																		
2(d)(ii)	<p>4 marks for any 4 of:</p> <table border="1" data-bbox="338 284 1323 1042"> <thead> <tr> <th data-bbox="338 284 831 347">associative phase</th> <th data-bbox="831 284 1323 347">autonomous phase</th> </tr> </thead> <tbody> <tr> <td data-bbox="338 347 831 448">1 uses mainly extrinsic feedback</td> <td data-bbox="831 347 1323 448">uses mainly intrinsic / kinaesthetic feedback;</td> </tr> <tr> <td data-bbox="338 448 831 549">2 tend to use knowledge of results</td> <td data-bbox="831 448 1323 549">tend to use knowledge of performance;</td> </tr> <tr> <td data-bbox="338 549 831 649">3 tends to need positive feedback</td> <td data-bbox="831 549 1323 649">can deal with negative feedback;</td> </tr> <tr> <td data-bbox="338 649 831 750">4 needs to be terminal feedback</td> <td data-bbox="831 649 1323 750">can cope with concurrent;</td> </tr> <tr> <td data-bbox="338 750 831 850">5 needs to be immediate feedback</td> <td data-bbox="831 750 1323 850">can cope with delayed feedback;</td> </tr> <tr> <td data-bbox="338 850 831 951">6 tends to need general feedback</td> <td data-bbox="831 850 1323 951">can use specific feedback;</td> </tr> <tr> <td data-bbox="338 951 831 1051">7 needs simple feedback</td> <td data-bbox="831 951 1323 1051">can use complex feedback;</td> </tr> <tr> <td data-bbox="338 1051 831 1042">8 relies more on a coach's input</td> <td data-bbox="831 1051 1323 1042">ability to correct own errors;</td> </tr> </tbody> </table>	associative phase	autonomous phase	1 uses mainly extrinsic feedback	uses mainly intrinsic / kinaesthetic feedback;	2 tend to use knowledge of results	tend to use knowledge of performance;	3 tends to need positive feedback	can deal with negative feedback;	4 needs to be terminal feedback	can cope with concurrent;	5 needs to be immediate feedback	can cope with delayed feedback;	6 tends to need general feedback	can use specific feedback;	7 needs simple feedback	can use complex feedback;	8 relies more on a coach's input	ability to correct own errors;	<b>4</b>
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2(e)(i)	<p>2 marks for:</p> <ol style="list-style-type: none"> <li>1 positive transfer example, e.g. netball shooting to basketball shooting / tennis serve to volleyball serve;</li> <li>2 optimising positive transfer – ensure skills have transferrable elements / similar movement patterns / relevant to other skills / make sure skills are thoroughly learned before attempting other skills / making the performer aware of the effects of transfer;</li> </ol>	<b>2</b>																		

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(e)(ii)	3 marks for:  1 negative transfer – where learning of a skill hinders the learning of another skill; 2 example of negative transfer, e.g. practising a forehand in badminton and then practising a forehand in tennis; 3 limiting negative effects by making the performer aware of the different elements in such skills or by only practising transferable skills / learn / perfect one skill before attempting the other;	<b>3</b>
2(f)(i)	1 mark for:  1 intrinsic <b>AND</b> extrinsic;	<b>1</b>
2(f)(ii)	5 marks for any 5 of:  1 make it fun / variation in training / more interesting; 2 use reinforcement / verbal encouragement / punishment / use of rewards / certificates / prizes; 3 provide feedback / examples; 4 more competition / set challenges; 5 set (more demanding / achievable) goals / targets; 6 alter environment to favour players / small numbers / feel competent; 7 use role models; 8 emphasise personal improvement; 9 avoid social comparisons / limit social inhibition;	<b>5</b>

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
3(a)(i)	<p>4 marks for:</p> <ol style="list-style-type: none"> <li>1 (outdoor recreation) activity in person's free time / voluntary / choice / leisure time;</li> <li>2 example implies activity in natural environment such as canoeing / sailing / rock climbing;</li> <li>3 (outdoor education) learning within or about the outdoors / natural environment;</li> <li>4 example implies instruction element / structured learning within activity, e.g. school ski trip;</li> </ol>	<b>4</b>
3(a)(ii)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> <li>1 appreciation / respect / understanding / of natural environment / environmental issues;</li> <li>2 know personal limits / develop self-reliance / courage / overcome fear / experience adventure or risk;</li> <li>3 communication / teamwork;</li> <li>4 trust in / awareness of others / survival / safety;</li> <li>5 decision making / leadership / challenging;</li> <li>6 acquire new skills / choice of activity / e.g. map reading / bushcraft / campcraft / climbing / canoeing etc.;</li> <li>7 opportunities for active leisure;</li> <li>8 improve fitness / health benefits / escape from stress / mental health;</li> <li>9 intrinsic motivation / fun / enjoyable;</li> <li>10 sense of achievement / fulfilment / confidence / self-esteem / awards / self-realisation;</li> <li>11 social / friendship;</li> <li>12 lifelong learning / qualifications / career;</li> </ol>	<b>4</b>
3(b)(i)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> <li>1 freedom of choice / free will / free time / voluntary;</li> <li>2 fun / intrinsic / enjoyment;</li> <li>3 satisfaction / 'well-being' gained from taking part;</li> <li>4 very few rules / modified / made up rules;</li> <li>5 limited moral obligation / commitment;</li> <li>6 low level of organisation / self-officiated / no formal official;</li> </ol> <p><i>If no example of activity max. 2 marks.</i></p>	<b>3</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>sport has / has more <b>OR</b> play does not have / has less:</p> <ol style="list-style-type: none"> <li>1 extrinsic rewards / winners and losers / competitive;</li> <li>2 structured / organised / leagues / cups;</li> <li>3 commitment / effort / training / practices;</li> <li>4 rules;</li> <li>5 time constraints / set time / scheduled;</li> <li>6 specific kit;</li> <li>7 specialist equipment / facilities;</li> <li>8 officials;</li> <li>9 tactics / strategies used;</li> </ol>	<b>4</b>
3(c)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> <li>1 increase in national prestige / feel-good factor;</li> <li>2 advertisement for the country / shop-window effect;</li> <li>3 provision of sporting facilities / legacy;</li> <li>4 demand / expectation from population for national success;</li> <li>5 confirmation of political superiority / political popularity;</li> <li>6 to enable individuals to succeed / reach potential / goals;</li> <li>7 encourage / increase participation / role models / general health;</li> <li>8 employment opportunities;</li> <li>9 improvements in trade / economy / tourism;</li> <li>10 improved infrastructure, i.e. better roads / hotels / transport;</li> </ol>	<b>4</b>

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Question	Answer		Marks
3(d)	2 marks for any 2 of:		<b>2</b>
private		public	
1	run by business / company	run by local authority departments / local council / (local) government;	
2	runs as a profit-making enterprise	trading on set prices / charges etc. / according to pre-set budget;	
3	financed by membership fees / sponsorship	may involve subsidies / council tax or equivalent;	
4	expensive monthly / annual fees / contract	affordable for most / cheap;	
5	faces problem of needing profit to survive	move to company management / CCT / Best Value;	
6	tends to be for the few / elitist	inclusive / for all / community provision / at every level;	
7	up to date / better / more modern facilities / equipment	not usually well equipped;	
8	personal trainers / coaches available	generalised supervision by employees;	

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Question	Answer	Marks
3(e)	<p>4 marks for any 4 of:</p> <p>For example:</p> <ol style="list-style-type: none"> <li>1 lack of resources / access to money / transport / disposable income may limit ability to participate;</li> <li>2 having time to take part in activities / available leisure time / holidays;</li> <li>3 availability of clubs / facilities / location to provide activity you want;</li> <li>4 lack of access to coaching limits range of activities / opportunities;</li> <li>5 media coverage / role models / health awareness may encourage participation;</li> <li>6 previous experience / education via school PE programme / previous success in similar sports may encourage continued participation;</li> <li>7 discrimination may limit opportunities to participate because of race / gender / disability / etc;</li> <li>8 peers / friends / family can encourage participation in their favourite activities;</li> <li>9 cultural / religious issues / holy days / dress codes may limit participation;</li> </ol> <p><i>Needs to explain how each factor may affect participation.</i></p>	<b>4</b>
3(f)	<p>5 marks for 5 of:</p> <p>advantages (sub-max. 3 marks)</p> <ol style="list-style-type: none"> <li>1 get money;</li> <li>2 provision of kit / equipment / trainers / boots;</li> <li>3 money used for training / facilities / coaches / competitions;</li> <li>4 results in improved preparation / performance;</li> <li>5 financial security;</li> </ol> <p>disadvantages (sub-max. 3 marks)</p> <ol style="list-style-type: none"> <li>6 product may be in opposition to values of sport / not healthy, e.g. cigarettes / alcohol;</li> <li>7 product may not suit the performer's image / damage future marketability / sponsorship deals;</li> <li>8 forced to use unsuitable / inferior / non-preferred equipment;</li> <li>9 performer 'tied' to sponsor's demands / loss of privacy / media demands;</li> <li>10 potential loss of sponsorship (due to poor results);</li> <li>11 pressure to win to maintain sponsorship / may lead to deviant behaviour;</li> </ol>	<b>5</b>