



Cambridge International AS & A Level

PHYSICAL EDUCATION

9396/12

Paper 1

May/June 2022

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 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.

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.

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Question	Answer	Marks
1(a)	3 marks for: 1 extension / adduction / rotation of shoulder; 2 dorsiflexion of ankle; 3 flexion / abduction / rotation of hip;	3
1(b)	4 marks for any 4 of: 1 the agonist contracts AND the antagonist relaxes; 2 actions are flexion AND extension; 3 (muscles) biceps brachii AND triceps brachii; 4 (flexion) agonist / contraction of biceps brachii OR (extension) agonist / contraction of triceps brachii; 5 (flexion) antagonist / relaxation of triceps brachii OR (extension) antagonist / relaxation of biceps brachii; 6 coordination of two muscle actions allows (smooth) movement at joint;	4
1(c)	6 marks for: 1 ball and socket; 2 flexion; 3 deltoid; 4 hinge; 5 plantar flexion; 6 gastrocnemius / soleus;	6
1(d)	3 marks for any 3 of: (performer B fitter because:) 1 lower resting / initial / final heart rate; 2 slower increase OR takes longer to reach steady state / plateau; 3 lower steady state / plateau / exercising heart rate; 4 more rapid recovery / steeper recovery gradient;	3

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Question	Answer	Marks
1(e)	<p>5 marks for any 5 of:</p> <ol style="list-style-type: none"> 1 (from muscles) via capillaries / venules / veins; 2 to vena cava; 3 into right atrium; 4 through tricuspid / right atrioventricular / right AV valve; 5 into right ventricle; 6 through pulmonary / semilunar valve; 7 to pulmonary artery (to lungs); <p>Answers must be in appropriate sequence.</p>	5
1(f)	<p>3 marks for 3 of:</p> <ol style="list-style-type: none"> 1 contraction of (skeletal) muscles compresses vein walls (forces blood back to the heart); 2 changes in pressure in the thoracic / chest cavity put pressure on (abdominal) veins (helping to force blood back to the heart); 3 partial contraction of smooth muscle in the vein walls (helps to force blood back to the heart); 4 gravity causes blood in the veins above the heart to flow back towards the heart; 5 pressure changes in the heart cause reduced pressure / suction pressure in veins (which leads to blood being sucked into heart); 	3
1(g)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 detected by chemoreceptors; 2 located in carotid arteries / aortic arch; 3 nerve impulses to respiratory control centre / RCC / medulla; 4 nerve impulses via phrenic / intercostal / sympathetic nerve / sympathetic nervous system; 5 to diaphragm / external intercostals / sternocleidomastoids / pectoralis minor / internal intercostals / abdominals; 6 increased rate of contraction of respiratory muscles; 	4

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Question	Answer	Marks
1(h)	2 marks for any 2 of: 1 (goblet cells secrete) mucus which traps inhaled debris; 2 cilia / ciliated epithelial cells move / waft mucus towards larynx / mouth; 3 (incomplete / c-shaped) rings of cartilage maintain opening; 4 layer of (smooth) muscle allows trachea to narrow during swallowing and coughing;	2

Question	Answer	Marks
2(a)	2 marks for: 1 underlying; 2 enduring;	2
2(b)	3 marks for any 3 of: 1 (named fundamental motor skill) e.g. running / kicking / jumping / catching / throwing OR fundamental motor skills are learned; 2 becomes adapted / developed OR e.g. kicking becomes passing in football; 3 needs practice OR trial and error helps development; 4 requires coaching / guidance / feedback / reinforcement / demonstrations;	3

Question	Answer	Marks
2(c)	<p>4 marks for 4 of:</p> <p>(description)</p> <ol style="list-style-type: none"> 1 'understanding' the process to achieve the result OR holistic approach; 2 cognitive / Gestaltist theory; 3 'Eureka' moment OR sudden understanding of relationship of various parts; <p>(benefits sub-max. 3 marks)</p> <ol style="list-style-type: none"> 1 performer experiences / understands the 'whole' activity (rather than skills in isolation); 2 allows learners to develop their own strategies / learn to make their own corrections; 3 better than being told what to do all the time; 4 helps to identify role in the activity; 5 increases motivation; 6 speeds up learning; 	4
2(d)(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 series of subroutines; 2 suitable example of subroutines; 3 is a generalised series of movements; 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

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Question	Answer	Marks
2(d)(ii)	3 marks for any 3 of: 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 OR no adjustments; 5 no conscious control OR runs autonomously; 6 it explains why performer reacts in a specific way to a situation; 7 memory trace starts the movement;	3
2(e)(i)	4 marks for 4 of: (perception sub-max. 3 marks) 1 interprets / judges / makes sense of information; 2 involves DCR process; 3 involves the use of memory; 4 selective attention occurs; (decision making sub-max. 3 marks) 5 translation / translatory mechanism; 6 dependent on selective attention; 7 involves STM / LTM / memory; 8 selects appropriate motor programme ;	4
2(e)(ii)	3 marks for any 3 of: 1 to motivate; 2 to reinforce / strengthen S/R bond; 3 to correct / give information on errors / mistakes / improve skills / adjust motor programmes; 4 to give knowledge on technique / knowledge of performance / knowledge of results;	3

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Question	Answer	Marks
2(e)(iii)	4 marks for: 1 (intrinsic) autonomous performers act on kinaesthesia / proprioception OR understand how the movement should feel; 2 (concurrent) autonomous performers can act on feedback during performance ; 3 (negative) autonomous performers can deal with / accept criticism OR do not need continuous praise OR are self-motivated; 4 (knowledge of performance) autonomous performers can correct their own errors OR understand performance requirements;	4
2(f)	3 marks for any 3 of: 1 increase in arousal = increase in likelihood of dominant response ; 2 performance is improved if dominant response is well learned OR performer is an expert / autonomous; 3 performance is reduced if dominant response is not well learned OR performer is a novice; 4 drive theory is not realistic as you cannot keep improving;	3

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Question	Answer		Marks	
3(a)	5 marks for any 5 of:		5	
		swimming as recreation		swimming as sport
	1 (who)	available to all		selective / elite / club members;
	2 (when)	no set time OR done in leisure / own time		set times;
	3 (where)	location decided by participants OR choice of where to swim in pool / lake / sea		location decided by external body OR specialised facilities, e.g. pool lanes / buoys in lake;
	4 (why)	free choice / voluntary / non-serious / no commitment / intrinsic rewards / fun		obligation / serious / commitment / extrinsic rewards;
	5 (rules)	limited rules / organisation / structure / no officials		rules / organised / structured / officials / teams;
	6 (comp.)	limited / no competition OR done for health / fitness		competitive / winners and losers;
	7 (skill / fitness)	limited / low levels of skill / fitness		high level of skill / fitness expected;
	8 (training)	no requirement for a trainer / coach		training / coaching a key element;
9 (media)	no media interest / spectators / funding / sponsorship	media interest / spectators / sponsorship / funding;		
Accept suitable similarities.				

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Question	Answer	Marks
3(b)	4 marks for any 4 of: 1 increase in national pride / feel-good factor; 2 advertisement for the country / shop-window effect; 3 provision of sporting facilities / legacy; 4 demand from population for national success; 5 confirmation of political superiority / political popularity; 6 to enable individuals to reach potential OR create role models; 7 encourage participation OR improve health; 8 employment opportunities; 9 improvements in trade / economy / tourism; 10 improved infrastructure / better roads / hotels / transport;	4
3(c)(i)	6 marks for any 6 of: 1 improve physical health; 2 improve social health / socialising / be part of a team / learn life skills, e.g. leadership; 3 improve mental health / relieve stress / escape reality; 4 improve self-esteem / confidence; 5 enjoyment / intrinsic rewards; 6 become skilful / knowledgeable; 7 achieve satisfaction of success / strive to achieve high standards / personal challenge of competition; 8 possibility of earning a living; 9 fame / praise / medals / status; 10 keep out of trouble / hobby; 11 socialisation / learning cultural values, e.g. values / ethics;	6

Question	Answer	Marks
3(c)(ii)	<p>4 marks for:</p> <p>1 named initiative described, e.g. ‘Step into Sport’ (UK) encourages young people to get involved in volunteering in sport and sports leadership OR ‘keep up with the play’ (NZ) to help people stay in sport’;</p> <p>2 second named initiative described, e.g. ‘get active to get healthy’ (UK) to encourage children and families to exercise more OR ‘Active communities’ (NZ) aims at reducing barriers to participation at a local level;</p> <p>3 third named initiative described, e.g. ‘school games programme’ (UK) to encourage more competitive sports in schools OR ‘balance is better’ (NZ) is about creating quality experiences for all young people to keep them active in the game;</p> <p>4 fourth named initiative described, e.g. ‘Join the Movement’ (UK) aims to inspire people to keep active OR ‘Every Body Active’ (NZ) four-year strategic plan to grow participation in young people;</p>	4
3(d)	<p>5 marks for any 5 of:</p> <p>1 need to win / win-at-all-costs attitude;</p> <p>2 frustration;</p> <p>3 referee’s decisions;</p> <p>4 losing / unable to play well;</p> <p>5 retaliation / being fouled;</p> <p>6 local derby / rivalry;</p> <p>7 importance of game;</p> <p>8 previous experience of opponents;</p> <p>9 hostile crowd;</p> <p>10 gamesmanship / verbal abuse;</p> <p>11 instinct / trait;</p> <p>12 social learning / copying others / reinforcement;</p> <p>13 overarousal of players;</p> <p>14 nature of activity / physical contact sports / presence of weapons / cues, e.g. hockey sticks;</p> <p>15 dehumanisation of players, e.g. helmets;</p> <p>16 use of drugs;</p> <p>17 emotional / off-the-pitch issues;</p> <p>18 encouragement / pressure from coach / significant others;</p>	5

Question	Answer	Marks
3(e)(i)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 (anatomical benefits) to build muscle / increase red blood cell count; 2 (fitness benefits) increase speed / strength / power / endurance / reaction time; 3 mask pain; 4 (psychological benefits) steady nerves / increase arousal / increase aggression / reduce anxiety; 5 delay fatigue / train harder / recover quicker / heal faster; 6 win-at-all-costs attitude / pressure to win (from coaches / sponsors / media); 7 money / fame / to extend career / to stay at top; 8 belief that everyone else is taking drugs OR the only way to succeed OR create a level playing field; 9 lose weight / make weight category; 10 granted TUE (therapeutic use exemption) OR prescribed for health benefits; 11 punishments are not a sufficient deterrent; 12 may become addicted to a drug OR other drugs no longer as effective; 	3
3(e)(ii)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 (longer) bans / fines / punishments; 2 highlight (potential) loss of income / loss of sponsorship (due to being banned from competing); 3 name and shame; 4 more research into better testing OR more research into improved detection techniques; 5 education (about the risks); 6 worldwide / unified policies / programmes to deal with problem OR more support for WADA; 7 use of positive role models; 8 make supplying / using drugs a criminal offence; 9 drug-free declaration by athletes; 10 athlete biological passport / ABP; 11 legalise drug use in sport; 	3