Cambridge Assessment International Education

Cambridge International AS & A Level

PHYSICAL EDUCATION **9396/33**

Paper 3 **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.

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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 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	<u>'List rule' guidance</u> 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)(i)	2 marks for: 1 (work) the product of force and distance **OR** force × distance; 2 (power) the rate at which work is done **OR** work ÷ time / energy ÷ time **OR** strength × speed;	**2**
1(a)(ii)	2 marks for: 1 (work) (kilo)joule / (kilo)calorie / erg / foot-pound; 2 (power) watt / joule per second; Accept other appropriate units.	**2**
1(b)	4 marks for any 4 of: 1 ATP/PC system **OR** alactic system; 2 anaerobic / no oxygen; 3 phosphocreatine / PC is broken down to produce energy **OR** PC → P + C + energy; 4 **energy** is used to resynthesise ATP **OR energy** + ADP + P → ATP; 5 (site of reaction) sarcoplasm; 6 (net yield) 1 ATP per molecule of PC;	**4**
1(c)	1 mark for: 1 with oxygen; 1 mark for any 1 of: 2 elevated respiratory / circulatory rates; 3 alactacid debt component **OR** fast component **OR** oxygen debt / EPOC;	**2**

Question	Answer	Marks
1(d)	6 marks for: 1 (specificity) training must be focused **on the** sport / event / fitness component / muscle groups / energy system; 2 (example) javelin thrower targets muscle groups of the shoulder; 3 (progression) training must **gradually** increase in overload / intensity / time; 4 (example) in weight training increase load from 90 kg to 95 kg; 5 (reversibility) if training stops training effects will be lost; 6 (example) if gymnast gets injured and cannot train then strength will drop **OR** an athlete with a hamstring injury should still do upper body work;	**6**

Question	Answer	Marks
1(e)(i)	4 marks for 4 of: 1 genetic factors / physiological make-up; 2 e.g. the presence of certain genes increases aerobic capacity; 3 muscular factors / muscle fibre type **OR** amount of mitochondria / myoglobin; 4 e.g. a low percentage of SO fibres will limit aerobic capacity; 5 respiratory factors / strength of respiratory muscles; 6 e.g. a large lung capacity will increase aerobic capacity; 7 gender / sex; 8 e.g. males tend to have a higher aerobic capacity; 9 illness / disease; 10 e.g. asthma / emphysema / COPD causes lower aerobic capacity; 11 age; 12 e.g. aerobic capacity increases from childhood to adulthood **OR** decreases from adulthood as age increases; 13 environment / altitude; 14 e.g. living at high altitude will cause aerobic capacity to increase; 15 body composition; 16 e.g. obesity causes aerobic capacity to decrease; 17 drugs / lifestyle; 18 e.g. EPO will cause aerobic capacity to increase **OR** smoking causes aerobic capacity to decrease;	**4**

Question	Answer	Marks
1(e)(ii)	5 marks for any 5 of: 1 cardiac hypertrophy **OR** increase in size / strength of heart; 2 increased stroke volume / ejection fraction; 3 increased **maximum** cardiac output; 4 reduced **resting** heart rate / bradycardia; 5 increased efficiency of vascular shunt **OR** increased efficiency of cardiac output; 6 increased elasticity of arterial walls; 7 decreased **resting** blood pressure **OR** improved blood pressure regulation; 8 increased blood / plasma volume; 9 reduced blood viscosity; 10 increased number of red blood cells / haemoglobin / increased oxygen-carrying capacity; 11 increased capillarisation; 12 reduced risk of CHD / hypertension / stroke;	**5**
1(e)(iii)	2 marks for any 2 of: 1 carbohydrates; 2 fats / lipids / free fatty acids / FFAs / triglycerides; 3 lactic acid / lactate;	**2**

Question	Answer	Marks
1(f)	3 marks for any 3 of: (method 1) 1 (7 days before event) reduce glycogen levels; 2 achieved by increased endurance training / training at high intensity; 3 then 3 days of low-carbohydrate diet / diet high in proteins and fats; 4 (3 or 4 days before event) tapering / reduction in training levels; 5 (and) high-carbohydrate diet, e.g. pasta (allow: the night before the race); 6 trained / elite athletes may rest for several days before eating high-carbohydrate diet; 7 increased water consumption helps the process; (method 2) 8 the **day before** the event complete (3 minutes of) high-intensity exercise; 9 opens a carbo(hydrate) window; 10 immediately / within 20 minutes intake a high-carbohydrate meal; 11 carbo(hydrate) window only lasts 2 hours **OR** carbohydrates must be eaten within 2 hours of exercise;	**3**

Question	Answer	Marks
2(a)	3 marks for any 3 of: 1 (behaviour is) a function of personality / traits **AND** environment **OR** B = f(PE); 2 combination of trait **AND** social learning theories; 3 (behaviour) depends on interaction between personality and situation; 4 role-related behaviour; 5 Hollander / Lewin;	**3**
2(b)	2 marks for: 1 (introversion) shyness / avoidance of social contact; 2 (stability) reliable / predictable;	**2**

Question	Answer	Marks
2(c)	5 marks for any 5 of: 1 persuasion / persuasive communication; 2 persuader must be high status **OR** use peers / role models who have a good attitude; 3 message must be accurate / clear / make sense; 4 performer must want to change attitude; 5 create situation where message can be put across effectively **OR** timing of message is important; 6 use cognitive dissonance; 7 alter one element of triadic model; 8 make strength training more enjoyable / fun; 9 show performer the value / benefits of strength conditioning; 10 use positive reinforcement / rewards; 11 set challenging / achievable goals; 12 show participation as a social norm;	**5**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(d)(i)</td><td>4 marks for any 4 of:
<table>
<tr><td></td><td>autocratic</td><td>democratic</td></tr>
<tr><td>1</td><td>task-oriented</td><td>person / social-oriented;</td></tr>
<tr><td>2</td><td>make most of the decisions</td><td>share decision making;</td></tr>
<tr><td>3</td><td>little interest in group members</td><td>interested in group members;</td></tr>
<tr><td>4</td><td>preferred method for many males</td><td>preferred method for many females;</td></tr>
<tr><td>5</td><td>better for most beginners / novices</td><td>better for most elite performers;</td></tr>
<tr><td>6</td><td colspan="2">autocratic preferable in dangerous situations;</td></tr>
<tr><td>7</td><td colspan="2">autocratic preferable when time is short / quick decisions needed;</td></tr>
<tr><td>8</td><td colspan="2">democratic preferable for most older performers;</td></tr>
<tr><td>9</td><td colspan="2">democratic preferable when discussion / consultation among group is required;</td></tr>
<tr><td>10</td><td colspan="2">autocratic preferable for highly favourable / unfavourable situations;</td></tr>
</table></td><td>4</td></tr>
<tr><td>2(d)(ii)</td><td>1 mark for any 1 of:

1 (group are) highly skilled / motivated / able to work effectively on their own / highly cohesive;
2 (task is) well-learned / safe / simple;</td><td>1</td></tr>
</table>

Question	Answer	Marks
2(e)	6 marks for: 1 (process) focus on technique / tactics; 2 (example) sprint start in 100-metre race; 3 (performance) focus on comparison to previous attempt; 4 (example) achieve a PB of 10.2 seconds in 100-metre race; 5 (product) focus on the outcome / result / beating an opponent; 6 (example) win a 100-metre race;	**6**
2(f)	2 marks for: 1 (trait) stable / innate / enduring / global / same in all situations **OR** (use of example in description) rugby player shows confidence in all areas of game; 2 (state) temporary / changeable / specific / depends on situation / environment **OR** (use of example in description) rugby hooker confident in scrum but not at line-out;	**2**
2(g)	3 marks for any 3 of: 1 at low arousal attention / focus is too wide / too many cues; 2 as arousal increases attention / focus narrows / attentional narrowing; 3 at optimum arousal attention / focus is only on relevant cues; 4 (overarousal) if arousal is **too high** attention / focus is **too** narrow / important cues are missed / attentional wastage / hypervigilance; 5 **changes in attentional width** affect level of performance; 6 link / association with inverted-U theory;	**3**

Question	Answer	Marks
2(h)	4 marks for any 4 of: 1 social inhibition; 2 arousal increases **above optimum** level **OR overarousal**; 3 dominant response is not the correct one; 4 skill is fine / complex; 5 performer is naturally anxious / high trait anxiety / introvert; 6 evaluation apprehension / perception of being judged; 7 proximity of audience; 8 nature of audience / loud / aggressive / distraction; 9 fear of failure / fear of letting people down; 10 higher pressure to perform **OR** higher incentive value for success; 11 not used to performing in front of an audience;	**4**

Question	Answer	Marks
3(a)	4 marks for any 4 of: 1 athletes from all over the world (meeting and) competing; 2 athletes of different colour / race / creed **OR** act against discrimination; 3 promotes fair play / sportsmanship **OR** act against doping; 4 promotes peace / harmony / cooperation; 5 provides a supreme mental / physical challenge; 6 promotes international understanding; 7 promotes an appreciation of cultural diversity;	**4**
3(b)	4 marks for any 4 of: 1 consists of (about 100) members / delegates; 2 (members) are elected / invited (by IOC); 3 executive board / president as head; 4 organises meetings / sessions; 5 **commissions**, e.g. athletes' commission / women in sport commission; 6 link between outside agencies, e.g. sports federations, NOCs and OCOGs; 7 not all countries represented;	**4**

Question	Answer	Marks
3(c)(i)	2 marks for: (1976 Montreal) 1 many African countries; 2 IOC's refusal to ban New Zealand for sporting links with South Africa;	**2**
3(c)(ii)	2 marks for: (1980 Moscow) 1 United States (and other countries); 2 Soviet Union invasion of Afghanistan;	**2**
3(c)(iii)	2 marks for: (1984 Los Angeles) 1 Soviet Union (and other Communist countries); 2 tit for tat / retaliation for 1980 boycott / disagreed with United States' promotion of Western ideals / concerns for athletes' safety;	**2**
3(d)	4 marks for any 4 of: 1 host nation sets agenda on who is invited; 2 countries lobby IOC to refuse entry to other countries; 3 Berlin (1936) policy of non-selection of Jewish athletes for German team / (but) one (token) Jewish athlete selected; 4 London (1948) Germany / Japan refused entry; 5 South Africa refused entry due to apartheid system; 6 Montreal (1976) Taiwan refused entry due to pressure from China; 7 Seoul (1988) North Korea refused to send athletes as they wanted to co-host Games; 8 countries choosing not to select women competitors for cultural / religious reasons; Accept other valid suggestions.	**4**

Question	Answer	Marks
3(e)	4 marks for any 4 of: 1 travel restrictions / traffic congestion; 2 increased taxes; 3 pollution; 4 relocation; 5 white elephants **OR** stadia not used after Games; 6 increased risk of infections (entering country); 7 security precautions **OR** increased risk of terrorism; 8 increased crime rate; 9 increased prices;	**4**
3(f)	4 marks for any 4 of: 1 increase in tourism; 2 attraction of mass audiences boosts economy; 3 revenue from ticket sales / merchandise / sponsorship / marketing programmes; 4 improved transport infrastructure; 5 employment opportunities; 6 availability of sporting facilities after Olympic Games; 7 use of Olympic Village as new housing; 8 profits from TV networks; 9 revenue from facilities as training sites; 10 national pride / feel-good factor **OR** volunteering creates greater community spirit; 11 increased health of country / greater participation; 12 success brings further economic benefits / Olympic Effect;	**4**
3(g)	4 marks for any 4 of: 1 playing for the love of sport; 2 no monetary gain; 3 not allowed to train / have a coach; 4 good sportsmanship / fair play / spirit of the game; 5 social class / upper class distinction; 6 exclusion of working class; 7 working class were believed to be unable to show these values;	**4**