



Cambridge International AS & A Level

PHYSICAL EDUCATION

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Paper 3

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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.

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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

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|---|--|
| 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 two reasons ...):</p> <ul style="list-style-type: none">• The response should be read as continuous prose, even when numbered answer spaces are provided.• Any response marked <i>ignore</i> in the mark scheme should not count towards <i>n</i>.• Incorrect responses should not be awarded credit but will still count towards <i>n</i>.• 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 <i>n</i> 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)	4 marks for: 1 time on x-axis and energy / contribution on y-axis; 2 correct shape of ATP/PC graph predominant between 0–10 seconds; 3 correct shape of lactic acid graph predominant between 10–180 seconds; 4 correct shape of aerobic graph predominant after LA system / approximately 3 minutes;	4
1(b)	4 marks for any 4 of: 1 circulatory rate / heart rate remains elevated to remove CO ₂ ; 2 diffuses from muscles into capillaries; 3 due to diffusion / pressure gradient / high to low pressure; 4 dissolved in plasma; 5 as carbonic acid / HCO ₃ ⁻ / hydrogen carbonate ions / bicarbonate ions; 6 combined with haemoglobin; 7 as carbaminohaemoglobin / HbCO ₂ ; 8 diffuses into alveoli (from capillaries); 9 exhaled / expired / breathed out from lungs;	4
1(c)	3 marks for any 3 of: 1 (majority of training) in pool / pool-based; 2 (focus on) specific stroke / skills / techniques / movement patterns; 3 (focus on) specific energy system(s) / specific distance of event; 4 (focus on) muscles used;	3
1(d)(i)	2 marks for any 2 of: 1 the maximum volume of oxygen used / consumed; 2 oxygen use per minute / unit of time ; 3 VO ₂ <u>max</u> ;	2

Question	Answer	Marks
1(d)(ii)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 performed on a cycle ergometer / exercise bike; 2 2 / 3 workloads OR increasing intensity; 3 each exercise period is (approximately) 3–6 minutes; 4 heart rate is monitored / recorded (at each workload); 5 HR between 100–150 bpm (during workloads); 6 results are plotted on a graph; 7 graph used to predict workload at 170 bpm; 8 score compared to standardised tables (to give predicted VO₂ max); 	4
1(d)(iii)	<p>6 marks for 6 of:</p> <p>(muscular – sub-max. 5 marks)</p> <ol style="list-style-type: none"> 1 hypertrophy / increase in size / mass of muscle; 2 hyperplasia; 3 stronger / more elastic tendons; 4 increased size / density of mitochondria; 5 increased stores of myoglobin; 6 increased stores of glycogen / triglycerides / FFAs / fats / increase in fat metabolism; 7 <u>fast oxidative / FOG / type 2a</u> muscle fibres become more aerobic; 8 increased / more <u>oxidative</u> enzymes; 9 increased capillarisation in muscles; <p>(respiratory – sub-max. 5 marks)</p> <ol style="list-style-type: none"> 10 stronger respiratory muscles; 11 increased tidal volume / minute ventilation / vital capacity; 12 reduced <u>resting</u> ventilation / breathing rate; 13 increased efficiency of mechanics of breathing; 14 increased surface area of alveoli OR increased use of upper / functioning alveoli; 15 increased capillarisation in lungs / at alveoli; 16 increased efficiency of gaseous exchange; 	6

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Question	Answer	Marks
1(e)	3 marks for any 3 of: coach could teach / introduce: 1 catching skills / techniques (against wall / with partner); 2 more advanced drills by reducing time to react / throw faster / harder / stand closer / throw to side / more balls; 3 invasion games based around throwing and catching; 4 juggling; 5 how to focus / concentrate / block out distractions / control arousal / improve selective attention;	3
1(f)	4 marks for any 4 of: (method 1) 1 reduce glycogen levels (7 days before race); 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 / 4 days before race) tapering / reduction in training levels; 5 ... and high carbohydrate diet / e.g. pasta; 6 trained / elite athletes may rest for several days before eating high carbohydrate diet; 7 increased water consumption helps the process; (method 2) 8 day before, complete 3 minutes of high-intensity exercise; 9 opens a carbohydrate window; 10 immediately / within 20 minutes intake a high-carbohydrate meal; 11 carb window only lasts 2 hours / carbohydrates must be eaten within 2 hours of exercise; <i>Descriptions must be in appropriate context.</i>	4

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Question	Answer	Marks
2(a)(i)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 people act differently in different situations OR behaviour is unpredictable; 2 people act differently if being watched / judged OR lack of <u>ecological validity</u>; 3 people lie / give answers that put them in a favourable light; 4 people misunderstand questions; 5 previous experience of profiling can influence answers given; 6 answers are dependent on mood / external factors; 7 results are subjective OR may be interpreted differently; 8 results may lead to stereotyping; 	4
2(a)(ii)	<p>1 mark for:</p> <ol style="list-style-type: none"> 1 some traits are useful for success in sport, e.g. competitiveness / determination OR useful to predict / prepare for behaviour OR some personality types are more suited to certain sports / roles within a team; 	1
2(b)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 large group size; 2 Ringelmann effect / lack of motivation / differences in motivation / attitudes / aspirations / expectations / goals / task versus social cohesion; 3 age / gender differences; 4 contracts / wage differences; 5 lack of team kit / identity; 6 lack of clear roles / responsibilities / some players do not feel part of the team; 7 social loafing / lack of effort; 8 cliques within the team / some players do not get on with others; 9 non-conformity to group norms; 10 poor leadership / communication; 11 leadership style does not match members' preferred style(s); 12 losing consistently / regularly; 13 wrong tactics used; 	4

Question	Answer	Marks
2(c)(i)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 (trait anxiety/A-trait) is stable / enduring / innate / genetic OR linked to personality factors; 2 (high A-trait) leads to feelings of apprehension / being threatened; 3 (high A-trait) performers may overreact / act irrationally; 4 (high A-trait) more likely to lead to high state anxiety; 5 (high A-trait) more likely to show avoidance behaviour / low self-confidence / do not take risks; 6 (high A-trait) more likely to miss relevant cues / lose focus; 7 (high A-trait) more likely to become more anxious in stressful situations; 8 (high A-trait) anxiety levels vary depending on the situation; 9 (high A-trait) causes cognitive / somatic effects / loss of coordination; 	4
2(c)(ii)	<p>4 marks for 4 of:</p> <p>(descriptions sub-max. 3 marks)</p> <ol style="list-style-type: none"> 1 preventing negative thoughts OR replacing thoughts with positive ones; 2 use of positive self-talk; 3 use of cue words / triggers; <p>(evaluations sub-max. 3 marks)</p> <ol style="list-style-type: none"> 4 can be done in many situations / settings; 5 difficult / time-consuming to learn OR needs a lot of practice OR not everyone is able to do it; 6 reduces attention capacity / can be distracting; 7 can highlight negative thoughts (rather than suppress them) / do not believe what they are saying; 8 cannot be done if person does not recognise their thoughts are negative; 	4
2(c)(iii)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 increase motivation / drive to achieve success; 2 increase confidence; 3 increase effort / persistence / determination; 4 increase focus / attention on important aspects of task; 5 improve specific skills / techniques / tactics / fitness components; 6 monitor progress; 7 prevent time being wasted on areas that do not need to be worked on; 	3

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Question	Answer	Marks
2(d)	<p>6 marks for any 6 of:</p> <ol style="list-style-type: none"> 1 (large audience causes) increase in arousal / high arousal; 2 (high arousal) dominant response is correct (for elite performers); 3 increase in performance / social facilitation; 4 incentive value of success is very high; 5 increase in motivation / drive to succeed; 6 supportive nature of crowd / atmosphere will increase effort; 7 (elite performers) able to focus in high-pressure situations; 8 more likely to get in the zone / zone of optimal functioning / peak flow experience; 9 higher self-confidence / self-belief; 10 exposure may lead to further sponsorship; 	6
2(e)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 effort is an unstable AND internal attribution; 2 it can be changed / controlled / increased next time; 3 may help to preserve self-confidence; 4 naïf / low achievers may be demotivated / lose self-confidence; 5 persistent blame on lack of effort as attribution may lead to learned helplessness / giving up; 6 (as it is unstable) it may increase motivation (to work harder); 7 players who felt they put maximum effort in will be demotivated; <p><i>Accept other appropriate evaluations.</i></p>	4

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Question	Answer	Marks
3(a)(i)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 promote peace / harmony; 2 promote ethics of sport / fair play / sportsmanship; 3 ensure Olympic Games takes place regularly / every 4 years OR manage bidding process to host Games; 4 education of youth through sport; 5 promote women in sport (at all levels) / gender equality; 6 lead the fight against doping in sport; 7 encourage development of sport for all / mass participation; 8 oppose any political / commercial abuse of sport / athletes OR promote health / safety of athletes; 9 promote a positive legacy to host cities / countries; 10 encourage concern for environmental issues OR promote sustainable development in sport; 11 support initiatives linking sport and culture; 12 support International Olympic Academy / IOA; 	4
3(a)(ii)	<p>3 marks for any 3 of:</p> <ol style="list-style-type: none"> 1 (gender) all events must have a male and female equivalent; 2 (gender) host conferences on women and sport; 3 for all races / creeds / religious beliefs; 4 (disability) development of Paralympics / allow disabled athletes to take part in Olympics; 5 (sexual orientation) encourage non-discrimination on sexual orientation; 6 promote peace / harmony through sport OR International Days OR promotion of human rights; 7 ban countries that discriminate; 8 allow athletes to compete under a neutral flag OR refugee team; 	3
3(b)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 (boycotts) use of boycotts / athletes prevented from attending Games to make a statement; 2 (nationalism) athletes used to promote superiority of race (e.g. Berlin 1936); 3 (ideology) athletes used to promote capitalism / communism; 4 (equality) use of indigenous athletes to show country is promoting equality; 5 (pride) successful athletes used to promote national pride / feel-good factor; 6 (shop window) athletes promote their own country as successful; <p><i>Explanations required for credit.</i></p>	4

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Question	Answer	Marks
3(c)	5 marks for any 5 of: <ol style="list-style-type: none"> 1 centralised system OR (much) government involvement; 2 government regulation of athletes / sports organisations; 3 (huge) financial investment; 4 talent search / talent identification at very early age; 5 specialist sports schools / facilities / training camps; 6 tough training regimes OR high drop-out rate; 7 most talented transferred to professional schools / municipal teams / national squads; 8 focus on all sports; 9 copying training systems of other countries systems OR employing best coaches; 	5
3(d)	4 marks for any 4 of: <ol style="list-style-type: none"> 1 increase in tourism; 2 revenue from ticket sales; 3 use of Olympic village as new housing stock; 4 job creation / employment opportunities; 5 revenue from facilities (as training sites) after the Games; 6 profitability to TV networks / sale of TV rights; 7 attraction of mass audiences boosts economy; 8 successful cities / Olympic Effect brings further economic investment; 9 higher tax revenues to government; <p><i>Credit other financial benefits for the host country.</i></p>	4

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Question	Answer	Marks
3(e)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 full-time training is necessary for Olympic success; 2 costs of equipment / facilities / travel; 3 costs of coaches / physio / nutritionist / psychologist / support staff; 4 Olympic Games needs the best athletes (for image as supreme challenge) OR media / Olympic partners put pressure on IOC to allow professionals to participate; 5 abuse of amateur ideals / shamateurs (when Games were amateur); 6 professional athletes have proved to be positive role models; 7 professionalism no longer seen as a negative concept; 8 other major events had professionals (e.g. World Cup) (while OG did not allow them) / conflict with other major events; 	4
3(f)	<p>2 marks for any 2 of:</p> <ol style="list-style-type: none"> 1 bribery / corruption of IOC delegates (to win right to host OG); 2 (several) IOC delegates expelled from IOC; 3 (previously) there were several unsuccessful bids by Salt Lake City; 4 Salt Lake City bid committee claimed IOC delegates demanded gifts (for votes) OR claimed other cities were giving lavish gifts to IOC delegates; 5 legal charges brought by USA (against bid committee); 	2
3(g)	<p>4 marks for any 4 of:</p> <ol style="list-style-type: none"> 1 competing against the best in the world / intensity of competition; 2 supreme mental / physical challenge / pushing achievements of body to limits; 3 honour of winning medal / performing at one's best; 4 representing your country; 5 opening / closing ceremony; 6 high media profile; 7 meeting members of / experiencing other cultures / sports / expanding horizon; 8 spiritual aspect / bravery of competition; 	4