Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICAL EDUCATION **0413/11**

Paper 1 Theory **October/November 2022**

MARK SCHEME

Maximum Mark: 100

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 2022 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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.

Question	Answer	Marks
1(a)	3 marks max. for identifying functions and 3 marks max. for relevant examples, e.g.: allows muscle attachment for movement; when punching / kicking; gives protection; when being hit / ribs protecting the heart / lungs / organs; (red / white) blood (cell) production; (red) to give oxygen to working muscles to last the bout / match / competition / (white) to keep them healthy for competition; provides shape / support; to maintain balance / not fall over when being pushed by opponent / perform with correct technique / stance; *Accept descriptions of how other functions of the skeleton benefit a performer. Examples must be applied to either judo or taekwondo.*	**6**
1(b)	1 mark max. for named injury and 1 mark for explanation of a suitable cause in a combat activity, for example: winding; being punched in the stomach; cuts; clash of heads / being punched / falling on ground; grazes; friction of body parts with mats or opponent during groundwork / a glancing punch; bruises; being kicked by opponent; *Accept other relevant examples and allow causes given above for different types of injury.*	**2**

Question	Answer	Marks
1(c)	1 mark for each suggestion of a strategy, for example: wearing appropriate clothing / footwear; lifting / carrying equipment safely or moving equipment in training; maintaining hydration throughout competition / training; use of warm up / cool down; following rules / referee / qualified coach present; suitable level of competition / fighting similar belts or experience / standard of ability or competition of same weight; preparation / training / being fit enough for the activity / health checks / using correct technique; ensure sufficient recovery time / avoid overtraining; ensure a safe environment; ensure access to medical support / first aid; *Accept other relevant strategies.*	**3**

Question	Answer	Marks
2(a)(i)	1 mark for each bone. A: scapula; B: humerus;	**2**
2(a)(ii)	1 mark for: flat;	**1**
2(a)(iii)	1 mark for the type of joint. hinge; 1 mark for type of movement: flexion **OR** extension;	**2**
2(b)	1 mark for: phalanges;	**1**

Question	Answer	Marks
2(c)	1 mark for each description: they connect bone to bone; help to stabilise joints during movement / helps prevent dislocation / restrict movement; they can absorb shock; help maintain correct posture / ensures correct movement;	**2**

Question	Answer	Marks
3(a)	1 mark for each muscle group: X: quadriceps (group); Y: hamstrings (group);	**2**
3(b)	1 mark for the main fibre type: slow twitch; 2 marks max. for characteristics: contracts slowly; produces little force; high fatigue tolerance / do not tire quickly / good for endurance; aerobic energy supply;	**3**
3(c)(i)	1 mark for: aerobic;	**1**
3(c)(ii)	1 mark for: glucose → lactic acid;	**1**

Question	Answer	Marks
4(a)	1 mark for: one arrow from the alveolus to the capillary; *For mark to be awarded then must be no incorrect arrows.*	**1**
4(b)	1 mark for each characteristic. 1 mark for each appropriate explanation, for example: characteristic: one cell thick; explanation: small distance for oxygen / carbon dioxide / gases to pass through faster; characteristic: surrounded by capillaries / blood supply; explanation: increases the amount of blood available for the transfer of gases / maintain concentration gradient; characteristic: large surface area / large number of alveoli; explanation: large area for gas exchange / diffusion to take place at / more gas can pass through; characteristic: walls of the alveoli are moist; explanation: gases dissolve to pass through; characteristic: the walls of alveoli contain elastic fibres; explanation: which allows the walls to increase surface area slightly during inspiration;	**4**
4(c)	2 marks for names of respiratory muscles and 2 marks for explanation. Functions must be different. diaphragm; contracts / flattens to increase volume of the thoracic cavity **OR** contracts / flattens to decrease air pressure in chest cavity; intercostal muscles; contract to pull rib cage upwards / outwards **OR** contract to increase volume of the thoracic cavity **OR** contracts to decrease air pressure in chest cavity;	**4**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>5(a)</td><td>2 marks for:
platelets;
white blood cells;</td><td>2</td></tr>
<tr><td>5(b)(i)</td><td>2 marks for two differences:

<table><tr><th>arteries</th><th>veins</th></tr><tr><td>thick / muscular walls</td><td>thin walls;</td></tr><tr><td>narrow lumen</td><td>wide lumen;</td></tr><tr><td>transport blood away from the heart</td><td>transport blood towards to the heart;</td></tr><tr><td>high pressure</td><td>low pressure;</td></tr><tr><td>arteries generally carry oxygenated blood</td><td>veins generally carry deoxygenated blood;</td></tr></table>
Credit ref. to pulmonary artery carrying deoxygenated blood and pulmonary vein carrying oxygenated blood as exceptions.</td><td>2</td></tr>
<tr><td>5(b)(ii)</td><td>1 mark for description:
prevent backflow of blood / stops blood from flowing backwards;</td><td>1</td></tr>
<tr><td>5(c)</td><td>2 marks max. for identifying structures and 2 marks max. for pathway.

structure A: left atrium;
pathway: pumps blood to the left ventricle;

structure B: right ventricle;
pathway: pumps blood through the pulmonary artery / to the lungs;</td><td>4</td></tr>
<tr><td>5(d)</td><td>1 mark for:
cardiac output;</td><td>1</td></tr>
</table>

Question	Answer	Marks
6	1 mark for: oxygen debt;	**1**

Question	Answer	Marks
7(a)	1 mark each for: mental; disease;	**2**
7(b)	2 marks for: advances in technology (in the home and workplace) / reduction in time needed to complete domestic tasks; improvements in healthcare / people living longer; more leisure facilities; reduced cost of equipment; improvements in travel methods / better public and private transport; wider / greater media coverage / more role models / exposure of more sports; *Accept other relevant suggestions that can influence the growth in leisure activities.*	**2**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>8(a)</td><td>2 marks for any 2 of:
suitability of performers for different physical activities (a different distance / type of activity could be better for a performer);
monitoring improvement / progression (after injury) / check for reversibility / ensure training is appropriate;
able to make comparison to others / enables a coach to know when a performer is able to take part / inform positional choices / are they fit enough?;
informing the design of a training programme / set targets / goals (the results might show a different type of training is needed);
(test as a source of) motivation;
has potential to prevent tedium / add variety to the training programme;</td><td>2</td></tr>
<tr><td>8(b)(i)</td><td>1 mark for each description and 1 mark for each example. Described examples must be from a games activity.
<table><tr><th>muscular endurance</th><th>reaction time</th></tr><tr><td>the ability of a muscle / group of muscles / part of body to carry out repetitive contractions / movements;</td><td>the time taken by a performer to respond / initiate movement to a stimulus;</td></tr><tr><td>(for example) repeatedly using same arm to serve in volleyball;</td><td>(for example) a goalkeeper diving to save a penalty;</td></tr></table></td><td>4</td></tr>
<tr><td>8(b)(ii)</td><td>1 mark for name of test:
Multi-Stage Abdominal Curl Conditioning Test;

3 marks max. for description:
subject performs sit ups in time with the bleeps on a CD / eq.;
arms are folded across the chest (with elbows forward) and knees bent;
sit up for elbow to touch the knees / body to be at 90 degrees;
bleeps get progressively quicker each minute;
subject performs until they can no longer keep up with the bleeps / technique loses correct form;
the total number of sit ups is counted;
and compared to normative data tables;</td><td>4</td></tr>
</table>

Question	Answer	Marks
8(c)	1 mark for each description. 1 mark for each appropriate example. overload is working the body harder than normal / working to allow adaptations on the body to occur; example: adding a (reasonable) weight to dumbbell / (gradually) increasing reps / running an extra mile or increase frequency / intensity / time of training; overtraining is when a performer does too much / excessive exercise; example: lifting weights that are too heavy / increasing reps unrealistically / running too far;	**4**

Question	Answer	Marks
9	1 mark for description and 1 mark for an appropriate example, for example: running / cycling with variation of speed / intensity / different terrains / gradients; jogging for 100 m, sprinting for 50 m and walking 25 m / cross-country running with sprints or jogging and sprinting to train both energy systems / aerobic and anaerobic work / running on road and sand dunes / up and down hills; *Accept any suitable example that has at least two changes in speed.*	**2**

Question	Answer	Marks
10(a)	1 mark for phase: familiarisation / skill-related activities; 1 mark for example: passing / shooting / control; *Accept any suitable practical example.*	**2**
10(b)	1 mark for each psychological reason: control / lower anxiety; control / increase / decrease arousal / to motivate; control / lower aggression; focuses mind on exercise / helps prepare mentally for competition; part of the build-up to match readiness; increase confidence;	**2**
10(c)	1 mark max. for phase: gradual decrease in pulse / stretches; 2 marks max. for different benefits: maintains flexibility; helps prevent muscle soreness / loosens tight muscles / help prevent stiffness / reduces DOMS; gradually reduces heart rate / blood flow; gradually reduces breathing rate / ventilation; reduces recovery time; helps prevent blood pooling / swelling; gradually reduces body temperature; reduces oxygen debt / clears lactic acid or waste products;	**3**

Question	Answer	Marks
11(a)(i)	1 mark for: Yerkes–Dodson (law);	**2**
11(a)(ii)	1 mark for **X** correctly positioned at or beneath peak;	**1**
11(b)	2 marks max. for explanation. 2 marks max. for practical examples. (point A) performer is distracted / taking in too many cues / paying attention to irrelevant cues / stimuli or player is tired / bored / lacks motivation; example: a football player not focusing on the ball; (point B) performer experiencing perceptual narrowing / miss relevant cues or player is anxious / too aggressive / poor decision making / too anxious / too much muscle tension; example: a netball player performing too many fouls in a game;	**4**
11(c)	1 mark for each relaxation technique*:* mental rehearsal; visualisation; deep breathing; *Accept other named relaxation techniques.*	**2**

Question	Answer	Marks
12(a)	1 mark for: for example, football / rugby world cup or Olympic Games / Tour de France / Commonwealth Games;	**1**

Question	Answer	Marks
12(b)	1 mark for each reason*:* improved / better stadia or training facilities; home advantage / better chance of success / win more medals; automatic qualification; increase in national pride / feel-good factor for country; raise profile of country; improved tourism; increased revenue / boost in economy; increased employment; legacy benefits; increased interest in sport / more people playing sport; better infrastructure / improved transport (road / rail) systems;	**2**

Question	Answer	Marks
13(a)	1 mark for each suitable explanation, for example: measurable: the coach will be able to compare the swimmer's previous performances to show their progress; realistic: the coach must ensure the goal set is within the capabilities of the swimmer to maintain motivation / or swimmer may give up / become injured; exciting: the coach provides the performer with drills that are interesting / fun to maintain interest / prevent tedium;	**3**

Question	Answer	Marks
13(b)	1 mark for each description: lots of practice / repeats; improving in the skill / technique or fewer mistakes / more accurate; combine the subroutines of the skill; more consistent; more able to make adjustments in technique; more able to respond to verbal feedback; still needs some extrinsic feedback; starting to concentrate for longer / less likely to be distracted; may use amended environment or deeper water / altered equipment; trying more advance skills and techniques; able to recognise more subtle cues; more confident; less need for manual / mechanical guidance; developing intrinsic feedback;	**3**
13(c)	1 mark for each type of guidance: verbal; visual; manual; mechanical;	**2**

Question	Answer	Marks
14(a)	1 mark for each justification: (gross) involves large (muscle) movements or many muscles used; (closed) not affected by the environment or predictable movement or movement / the movement is the same every time;	**2**

Question	Answer	Marks
14(b)(i)	1 mark for each suggestion, for example: reduce anxiety / nerves / stress / keeps them calm / eases panic / relaxes player; reduces heart rate; gives steady hands / improve precision or accuracy; reduces aggression / controls arousal; aids focus / able to ignore distractions better; able to sleep better before event; to keep up with the competition / others are using them / level playing field; increased fame; increased wealth; pressure from coach / pressure to win; gain an unfair advantage;	**2**
14(b)(ii)	1 mark for each disadvantage, for example: health implications; financial penalty; public humiliation / reputation ruined; disqualification or being banned; effect on other competitors; lose sponsor;	**2**
14(c)	1 mark for each strategy: arrange urine testing / blood testing; ban drugs / produce or update list of banned drugs; (lifetime / longer) bans / disqualification; (larger) fines; random / more regular / out of competition testing in all sports; sponsor research into health effects; better use of technology to test / detect; use of biological passports; education / highlight negative effects; promote positive role models;	**2**