Cambridge Assessment International Education

Cambridge IGCSE™

PHYSICAL EDUCATION **0413/11**

Paper 1 Theory **October/November 2020**

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 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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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.

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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.

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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	*1 mark for stating each muscle fibre type.* slow twitch; fast twitch; *Accept other recognised muscle fibre types.*	**2**

Question	Answer	Marks
2(a)	*1 mark for naming an appropriate event.* for example: Olympic Games (summer / winter); World cup (in a named sport); *Accept other global sporting events.*	**1**
2(b)	*1 mark for each description of an advantage.* stadia and training facilities: new stadia and training facilities are built / ensures that the country has world-class facilities / after the games they can host further international competitions / for community use; home advantage: the host nation has a home advantage and usually performers achieve above normal expectations / the home nation usually does not have to qualify to compete / the home performer has the opportunity to train / get used to the facilities; increase in national pride: hosting the event can create a feel-good attitude throughout the country / national pride / high level of interest in the event; improved tourism: an increase in visitors to the country / some tourists may revisit the country / the host becomes well known for future visits / business interests; increased employment: more employment from building facilities / during the event in the hospitality / tourism industry / the economy will increase with the additional money brought into the country; legacy implications: the facilities are left for future use / interest in sports is built on for future generations / increase in participation levels / greater awareness of sport; infrastructure: improvements in road / rail / hotels, etc. / communication systems that will be available for the host community after the event; redevelopment: some areas will be redeveloped / providing new housing and social facilities;	**5**

Question	Answer	Marks
3(a)	*1 mark for each example described in an appropriate physical activity.* for example: artistic gymnastics: use of a harness to support a gymnast learning to perform a somersault; swimming: use of flotation aids to develop the leg action / to correct the body position in the water; *Accept other examples.*	**2**
3(b)(i)	*1 mark for each stage.* first stage: cognitive (stage); final stage: autonomous (stage);	**2**
3(b)(ii)	*1 mark for each difference.* for example: first stage could be mainly knowledge of results **AND** the final stage should be mainly knowledge of performance; first stage may be brief / given in small chunks **AND** the final stage may be longer / more involved / more detailed; first stage may focus on a basic skill **AND** the final stage may focus on a complex skill / tactics; first stage may use simple language **AND** final stage may use technical language; first stage may be given straight away **AND** final stage feedback may be delayed; first stage may be terminal **AND** final stage may be concurrent; first stage should try to be positive **AND** final stage may have a negative component; first stage may need explanation of task **AND** final stage may not require this; *Accept other appropriate suggested differences.*	**3**
3(b)(iii)	*1 mark for stating a benefit.* the performer will be able to adjust technique / make tactical changes / without direction from a coach / performer will be able to feel / recognise when a skill is performed correctly or incorrectly / can make adjustments to the skill during the performance;	**1**

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Question	Answer	Marks
4(a)(i)	*1 mark for stating each type of joint.* shoulder joint: flexion; elbow joint: extension;	**2**
4(a)(ii)	biceps; triceps; biceps relax / lengthen **OR** biceps act as the antagonist; triceps contract / shorten **OR** triceps act as the prime mover / agonist;	**4**
4(b)(i)	*1 mark for naming each type of synovial joint.* shoulder: ball and socket (joint); elbow: hinge (joint);	**2**
4(b)(ii)	*1 mark for naming each component (3 marks max.). 1 mark for each description of a different function of each named component (3 marks max.).* synovial membrane; surrounds the joint capsule / produces synovial fluid / lines the cavity of the joint / encloses the joint; synovial fluid; acts as a lubricant / allows smooth movement / reduces wear / reduces friction / absorbs shock; joint (fibrous) capsule; surrounds / protects the joint / holds the joint together / encloses the joint; ligament; holds the bones together / keep bones in place; cartilage; stops the bones knocking together / acts as a shock absorber / cushion / reduces friction; *Accept other suitable components and appropriate descriptions of functions.*	**6**

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Question	Answer	Marks
5(a)	*1 mark for naming each component.* A: glucose; B: carbon dioxide;	**2**
5(b)	*Up to 2 marks for justifications for each appropriate physical activity. 1 mark for each appropriate justification.* for example: *mainly aerobic respiration:* cross country running / long-distance running / cycling justifications: activities that are endurance based / activities require energy over a long period of time; oxygen needs to be supplied to muscles throughout the activity / needs large volumes of oxygen; is a low intensity activity; muscles contract slowly / the activity requires little muscular force; activity requires the performer not to tire quickly / lactic acid is not produced so does not fatigue quickly / muscles can contract for a long time; credit specific justifications, e.g. be able to complete a cross-country race; *mainly anaerobic respiration:* sprinting / named throwing events, e.g. shot put / named jumping events, e.g. long jump justifications: short activity / activity requires energy over a short period of time; activity does not need oxygen supplied to the working muscles; is a high intensity activity; muscles contract quickly / the activity requires large muscular force / strength / power / speed; credit specific justifications, e.g. an all-out effort when taking off from the board in long jump;	**4**

Question	Answer	Marks
6(a)(i)	*1 mark for a description of each stage of information processing applied to the table tennis player.* input: when the player receives information such as the speed / direction / spin of the ball / the position of the opponent; decision making: based on the analysis of the information received / stored in the memory, the player will select the type of shot to play / decide where to move; feedback: the result of the action will inform the player if successful or unsuccessful / if successful they will repeat the action in the future / if unsuccessful they will adapt the action in the future;	**3**
6(a)(ii)	*1 mark for explaining the concept. 1 mark for explaining how it might affect the table tennis player.* the concept: when receiving many stimuli from the environment, the brain can only deal with one stimulus at a time / the first stimulus has to be dealt with before a second stimulus can be dealt with; *Accept alternative wording.* how it might affect the table tennis player: when there is too much information this can cause confusion / mistakes / slower reactions / incorrect actions / may move the wrong way / may play the wrong shot; *Accept specific examples.*	**2**
6(b)	*1 mark for describing each difference.* short-term memory holds small amounts of information / has a limited capacity **BUT** long-term memory is thought to be limitless; short-term memory retains information for a short period of time **BUT** long-term memory retains information for a long period of time / permanently; information is retained in the long-term memory **BUT** can be lost from the short-term memory (if not practised); all new information goes into the short-term memory **BUT** information cannot go directly into the long-term memory;	**2**

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Question	Answer	Marks
7	*1 mark for each description.* families may follow a particular team; parents may act as a coach; parents provide financial support / buy equipment / pay for coaches; parents provide transport / go with children to events; encourage / motivation from parents / parents go to watch children perform; children go to watch parents perform; children watching / playing with siblings; family tradition to play / take part in a particular activity; parents force children to participate / parents pressurise children to win; a family's religion / culture may restrict some activities; *Accept other examples and reverse arguments.*	**3**

Question	Answer	Marks
8(a)	*1 mark for:* circuit training; *Accept HIIT.*	**1**
8(b)	*1 mark for each reason suggested.* for example: allows for different aspects of fitness to be trained; most major muscle groups targeted; provides rest interval; variety of activities makes training interesting; can have a competitive element that adds motivation; easy to overload; can easily be adapted to a particular sport if interests change; easy to set goals / monitor progress; *Accept other examples.*	**2**

Question	Answer	Marks
8(c)	*1 mark for each principle named. (3 marks max.)* *1 mark for applying each named principle. (3 marks max.)* frequency; increase the number of sessions per week / from once per week to twice per week; intensity; increase the number of stations / increase the time at each station / reduce the rest period; time; increase the amount of time for a training session / increase the length of the whole training session; type; change the types of exercises / vary the stations / focus the circuit on other areas; *Accept other examples that apply the principles.*	**6**
8(d)	*1 mark for each danger stated.* for example: often tired / fatigued; muscle soreness; loss of interest / lack of motivation / lower self esteem; difficult to sleep (despite being tired); loss of appetite; mood swings / irritable; prone to minor infections / illnesses (accept examples); minor injuries more common / overuse injuries (accept examples); level of performance reduces despite working hard / reversibility occurs; lack time for a social life which can affect mental health;	**3**

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Question	Answer	Marks
9(a)	*1 mark for each description.* vena cava: carries (deoxygenated) blood from the body to the right atrium; pulmonary vein: carries (oxygenated) blood from the lungs to the left atrium; aorta: carries (oxygenated) blood from the left ventricle to the body; pulmonary artery: carries (deoxygenated) blood from the right ventricle to the lungs;	**4**
9(b)	*1 mark for each description.* the heart size increases in size / hypertrophy / thicker walls; resting pulse rate / resting heart rate reduces / bradycardia; stroke volume increases / (maximal) cardiac output increases / the volume of blood pumped in one minute increases / increase in volume of blood pumped in a single beat; returns to resting heart rate more quickly; increase strength of / stronger contractions; reduction in heart disease / diseases;	**2**

Question	Answer	Marks
10(a)(i)	*1 mark for a correct positioning of X.*	**1**

Question	Answer	Marks
10(a)(ii)	*1 mark for each force identified. 1 mark for an explanation for each identified force.* for example: gravity / weight; pulls the sprinter towards the ground as they drive out of the blocks / forces the athlete's feet to return to the track; ground reaction force; the greater the force from the sprinter into the track the greater the reaction force on the sprinter which moves them upward and forward; air resistance / drag; the faster the sprinter accelerates the greater the air resistance / acts against the motion of the sprinter / slows the sprinter down; muscular force; a greater muscular force from the sprinter means they will get away from the blocks faster;	**4**
10(b)	*1 mark for each description of a benefit for a sprinter.* for example: a warm up **reduces** the possibility of injury; warms the joints / warms the muscles / allows the sprinter to have a good range of movement / longer stride length; **increased** blood flow / **increased** heart rate / **increased** pulse rate / there is already **more** oxygen getting to the muscles; sprint starts / sprinting technique already practised / block spacing and position are correct; allows the sprinter to focus on the race / mentally prepare for the race;	**3**

Question	Answer	Marks
11(a)	*1 mark for a correct description.* connects muscle to bone / pull on bone when muscles contract / transfer force between muscle and bone / can store and recover energy;	**1**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>11(b)</td><td>1 mark for each description.

for example:
poor technique / the performer places tendons / muscles under greater pressure than normal due to the poor position of the limb / over stretching the tendon / muscle;
poor footwear / places the foot in an unnatural position putting additional pressure on the tendon;
not stretching before the activity / insufficient warm up / the muscles lack flexibility so tendons are forced to stretch beyond the expected range during the early stages of their performance;
muscle overuse / repetitive movements / continual use / can result in inflammation of the tendon;
quick / sharp movements / a sudden movement places tendons under greater pressure;
direct collision to tendon / direct damage to the tendon may cause a tear;</td><td>2</td></tr>
<tr><td>11(c)</td><td>1 mark for a description of a different benefit for each component.

rest: limits the effects of the injury / stops the injury from getting worse / prevents further damage;
ice: reduces swelling / reduces pain / reduces blood flow to the injured area;
compression: supports the injured area / immobilises / reduces blood flow to the injured area / helps reduce swelling / provides pressure to secure ice pack;</td><td>3</td></tr>
<tr><td>12</td><td>1 mark for each different type of PED named. (3 marks max.) 1 mark for each different relevant benefit related to the activity and type of PED. (3 marks max.)

for example:
<table>
<tr><th>physical activity</th><th>type of PED</th><th>benefit on performance</th></tr>
<tr><td>shot put</td><td>anabolic steroids;</td><td>increase muscle mass / greater strength to throw further;</td></tr>
<tr><td>golf</td><td>beta blockers;</td><td>reduce anxiety / able to be calm when putting the ball;</td></tr>
<tr><td>sprinting</td><td>stimulants;</td><td>increase alertness / ready to respond at the start of the race;</td></tr>
</table>
Accept other examples where appropriate.</td><td>6</td></tr>
</table>

Question	Answer	Marks
13(a)	*1 mark for each part of the description.* the volume of oxygen that can be used / consumed / the rate of use of oxygen; while exercising at a maximum level; **OR** the maximum volume of oxygen; an athlete can use / consume; *Accept alternative wording*.	**2**
13(b)(i)	*Both responses needed for 1 mark.* individual's gender: male; individual's activity: distance runner;	**1**
13(b)(ii)	the shot putters do not train aerobically / neither the shot putters nor the inactive individuals train aerobically / the shot putters will train anaerobically (and the inactive individuals do not train at all); *Accept alternative wording.*	**1**
13(c)	*1 mark for each factor stated.* for example: age; genetics; lifestyle; training;	**3**

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Question	Answer	Marks
14(a)	*No mark for naming a physical activity. 1 mark for an example of each characteristic described.* for example in tennis: fluent: a player is able to hit the ball using a full swing of the racket in a flowing movement; consistent: the player is able to hit most first serves with control into the opponent's court; accurate: the movements are precise so the player is able to keep the majority of balls in court; goal-directed: shows a performer being determined to achieve their target, such as hitting shots to an opponent's weakness;	**4**
14(b)	*Examples of skills must be from the same activity. 1 mark for an appropriate description for each type of skill.* for example: basketball: open skill: dribbling the ball to go past a player; closed skill: taking a free throw from the free throw line; football: open skill: a goalkeeper saving a shot; closed skill: taking a penalty kick; *Accept other examples.*	**2**

Question	Answer	Marks
15(a)	*1 mark for each relevant goal-setting principle named.* specific; agreed; realistic; time-phased; exciting; recorded;	**2**

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Question	Answer	Marks
15(b)	*1 mark for describing a measurable goal related to an appropriate named physical activity.* for example: basketball: to score an average of 12 points in a game throughout the season; sprinting: to reduce a personal best in the 100 metres by 0.5 seconds; football: to score 20 goals in a season; cricket: to score a century once during the season; *Accept other examples.*	**1**

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