Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICAL EDUCATION **0413/12**

Paper 1 Theory **May/June 2019**

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.

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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.

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Note that candidates may only use physical activities listed in the syllabus as examples in their answers to Paper 1.

Question	Answer	Marks
1	*Any 2 of:* radius; ulna; humerus;	**2**

Question	Answer	Marks
2(a)	the ability to cope with / meet the demands of the environment; *Accept alternative wording.*	**1**
2(b)	*1 mark for each explanation.* *Any 2 of:* a decrease in fitness because of ill-health / unable to train (lowers fitness); an increase in fitness because of good health / able to train (increases fitness); increase in fitness despite ill-health / unhealthy but still able to train and keep fit; exercise and fitness can have positive effects on physical / mental / social health;	**2**
2(c)	*1 mark for each description.* *Any 3 of*: able to cope with stress; can control emotions; feel good / self-esteem / confidence / be motivated;	**3**

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Question	Answer	Marks
3(a)	*1 mark for each factor.* *Any 3 of*: age / maturity / experience / stage of learning; culture; motivation; anxiety; arousal conditions; facilities; environment; teaching / coaching / practice; *Accept other valid answers.*	**3**
3(b)	*1 mark for each example used to show a characteristic.* *Answers should be linked to 3 of the following characteristics:* for example: fluent – a performer is able to perform a skill without hesitation / makes quick decisions / moves smoothly from one skill to another, e.g. a netball player catching a ball and pivoting immediately; aesthetically pleasing – a movement looks good, e.g. a gymnast completes a twisting movement that looks easy and will score high marks with a judge; consistent – a performer is able to complete a skill repeatedly, e.g. a tennis player is able to complete a high proportion of first serves; accurate – a performer is able to complete the task successfully / exactly / without error, e.g. a basketball player scores a free throw; goal-directed – a performer focuses on performing a specific task and being determined to achieve this goal, e.g. a sprinter trying to achieve a personal best; coordinated – a performer being able to move different parts of the body efficiently and with control, e.g. a basketball player dribbling the ball;	**3**

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Question	Answer	Marks
3(c)	*1 mark for each description.* for example: providing income; able to concentrate on training / more time available to train / able to give up work / become professional; have access to / provided with (good-quality) equipment / kit; able to access (good-quality) coaches; able to access (good-quality) facilities; able to travel to train / compete; able to access specialist sports science / medical support / diet advice; increases the popularity / exposure of a performer / become a role model / higher profile on social media;	**3**

Question	Answer	Marks
4	*1 mark for each correct answer.* *movement:* extension; *agonist:* quadricep(s) / quadriceps group;	**2**

Question	Answer	Marks
5(a)(i)	*1 mark for naming each component of fitness.* *1 mark for a correct explanation of a benefit of each named component applied to a cyclist.* *1 mark for any 3 of:* agility; balance; coordination; flexibility; muscular endurance; power; reaction time; speed; strength; *Explanation of benefit must relate to those for a cyclist.* for example: agility – the cyclist may need to quickly dismount their bike when a mechanical issue occurs / and quickly re-mount; balance – being able to stay on the bike when going around sharp bends at speed / able to avoid other cyclists or obstacles / road furniture without falling off; coordination – being able to ride and steer the bike / change gears / avoid obstacles at the same time / able to collect food bag / items and manipulate items on the move; flexibility – having mobility at the hip / knee / ankle / elbow to provide a smooth movement and maintain a streamlined position; muscular endurance – each part of the race requires the cyclist to cover considerable distances / be able to contract the muscles in the legs for long periods of time / long duration the cyclist then has to repeat the exertions for a number of days;	**6**

Question	Answer	Marks
5(a)(i)	power – able to overcoming resistance, e.g. to maintain speed up hills / on sprints; reaction time – the cyclist must be able to react quickly to other cyclists breaking away from the group so they do not get left behind / manoeuvre around other cyclists who may suddenly be blocking their route / able to avoid road furniture; speed – the ability to have good leg speed on pedals during sprint finishes / able to overtake / beat an opponent / maintain position; strength – the cyclist will need to exert additional force when there is a sharp incline / for the sprint at the end / needs to maintain or increase speed;	
5(a)(ii)	*1 mark for naming a test.* *2 marks for describing two key points of the named test.* *tests should include:* Multi-Stage Fitness Test / 12-Minute Cooper Run; *Multi-Stage Fitness Test:* performer must run in time with the bleeps on a CD / eq.; 20-metre / measured shuttles are performed; time between bleeps reduces as test progresses / bleeps get closer together / the subject must run faster; subject runs until they can no longer keep up with the bleeps; the level achieved and the number of shuttles performed within the level are recorded; scores are compared to standardised normative data; *12-Minute Cooper Run:* subject runs / walks as far as possible; test duration is 12 minutes; a measured course is used, e.g. with cones placed at regular intervals to help identify the exact distance covered / measured laps; calculate the distance covered; the distance covered is compared to standardised normative data;	**3**

Question	Answer	Marks
5(b)	*1 mark for each reason.* for example: suitability of performer for different physical activities (a different distance or type of activity could be better for the performer); identifying strengths and weaknesses (identify areas of performance that need improvement); monitoring improvement / progression (after injury) / check for reversibility (ensures training is appropriate); comparisons 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 may show a different type of training is needed); (test as a source of) motivation;	**2**

Question	Answer	Marks
6(a)	*Responses must apply the model to the example of a skill.* *1 mark for each correct explanation at each stage.* *example of a skill could be batting in cricket:* input: batsman sees the ball coming towards them / speed of ball / spin / direction; decision-making: batsman decides what shot to play / what direction; output: batsman plays the appropriate shot (after recognising the position of the ball); feedback: the batsman sees the ball go where intended or not and adjusts technique for future as needed; *Accept a relevant example of intrinsic or extrinsic feedback*.	**4**

Question	Answer	Marks
6(b)	*2 marks for:* a performer can only process a certain amount of information / one piece of information at a time; too much information can cause confusion / information overload / too much information can result in mistakes being made;	**2**

Question	Answer	Marks
7(a)(i)	*1 mark for the position of effort in the middle.* *1 mark if other 2 components are correctly positioned and labelled.*	**2**
7(a)(ii)	*1 mark for a correct example.* for example: bending the elbow to lift a weight / bicep curl; straightening the leg at the knee / to kick ball;	**1**
7(b)	*1 mark per term:* *force:* a pull or a push action (applied upon an object); *(Accept force = mass × acceleration.)* *mass:* the quantity / amount of matter in a body / idea of how much matter; *acceleration:* the rate at which an object changes speed / time taken to change speed / velocity; *Accept F = m x a or a correct re-arrangement of this equation for 1 mark.*	**3**

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Question	Answer	Marks
8(a)	a state of excitement / alertness / mentally / physically ready to perform a task; *Accept alternative wording.*	**1**
8(b)	*1 mark for y-axis labelled performance.* *1 mark for x-axis labelled arousal.* *1 mark for an appropriately shaped curve.* *1 mark for identifying the optimal level of arousal.*	**4**
8(c)	*1 mark for an example of a skill requiring a high level of arousal.* for example, tackling in rugby; *1 mark for an example of a skill requiring a low level of arousal.* for example, putting in golf; *1 mark for explanation of why the level of arousal varies:* for example, low arousal: fine skill / requires precision / stay calm; **OR** high arousal: gross skill / requires all-out effort; *Explanation must relate to examples given.*	**3**

Question	Answer	Marks
9	*1 mark for naming each level*. *A:* performance; *B:* participation; *C:* foundation;	**3**

Question	Answer	Marks
10(a)(i)	fast-twitch (muscle fibres); *(Accept type II.)*	**1**
10(a)(ii)	*1 mark for each benefit applied to the athlete's performance.* for example: produces speed which is needed during the run-up / run faster; provides power which is needed during run-up / take-off / jump; produces energy quickly as doesn't require oxygen, needed for all-out effort after short run-up; contract quickly for fast leg speed during run-up;	**2**
10(b)	*1 mark for naming each force.* *1 mark for explaining how each force acts.* for example: gravity / weight; when the athlete is in the air the pull of gravity pulls them downwards towards the ground; air resistance; opposes movement of athlete slowing them down / increases as speed increases / opposing movement; muscular force; the muscular force of the athlete will determine the speed of the run up and the drive from the board; ground reaction force; the harder the force from the athlete into the ground the greater the reaction force on the athlete;	**4**

Question	Answer	Marks
11(a)	8–10 (years);	**1**
11(b)	*1 mark for each reason.* for example: fewer opportunities for female participation in sports / fewer teams or clubs for females in some sports / fewer teams / clubs / female-only groups in some sports; may be more conscious (of their bodies) / uncomfortable being watched / fear of appearing masculine; lack of female coaches / less comfortable with male coaches; lack of role models / less media coverage of female sports; cultural / religious reasons / clothing may prevent participation in certain sports; some females are less competitive / less likely to take part in competitive sports; may be influenced by peers; puberty changes / starting of periods; may be interested in school-work / education / susceptible to exam pressure; may have other commitments / part-time work / other interests / bored with playing sport; influence of technology / social media; lack of support / lack of value placed on sport by society; discrimination;	**4**

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Question	Answer	Marks
12(a)(i)	*1 mark for naming **AND** applying each principle of overload to a fitness programme.* frequency – increase how often a person should exercise; intensity – increase how hard a session is by using heavier weights, more repetitions, longer distance etc. / decrease rest time; time – increase how long a session lasts / start with short sessions and increase the time of the sessions; type – range of activities used / provide a variety of activities; *Accept other descriptions of application.*	**2**
12(a)(ii)	*1 mark for each effect.* for example: heart rate increases; adrenaline is produced / released into the blood; breathing rate increases / more oxygen enters the lungs; body temperature increases / muscles become warmer; sweating; blood vessels closer to the skin enlarge to release heat / vasodilation / redistribution of blood / red skin; fatigue / feeling tired; suffer from nausea / feeling light-headed / feeling unwell; more carbon dioxide is produced; lactic acid is produced; increase in stroke volume; increase in cardiac output; increase in tidal volume; increase in minute volume; increased blood flow / oxygen supply to muscles; increased blood pressure; *Accept other correct responses.*	**2**

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Question	Answer	Marks
12(b)	*1 mark for each explanation of the effect on recovery time.* for example: intensity of exercise: the harder a person exercises the longer the period of recovery; age: older people take longer to recover; sleep: quality / sufficient sleep allows performers to recover more quickly; quality of equipment: such as running shoes / protective equipment can reduce the impact on joints so less damage and so quicker recovery; overtraining: if a performer has been overtraining they will tire more quickly / recover more slowly / fatigue quickly / risk injury so take longer to recover; genetics: some people's genetic make-up enables them to recover faster compared to other people; environment: e.g. exercising in extreme conditions results in longer recovery; diet: recovery will be slowed if post-exercise nutrition not taken at the right time; hydration: recovery will be slowed if performer becomes / stays dehydrated; use of cool down / massage / ice baths / recovery aids: causes lactic acid to be removed reducing recovery time; lifestyle: taking drugs / smoking may slow recovery; level of fitness: a fitter performer will have a faster recovery period; general health / body weight: poor health or being overweight increases recovery time; the muscle groups exercised: major muscle groups need more time to recover than exercises that use smaller muscle groups; levels of lactic acid in muscles / ability to tolerate or remove lactic acid: if lactic acid removed more slowly recovery time will be longer;	**3**

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Question	Answer	Marks
13(a)	*1 mark for each explanation.* for example: to ensure competition is fair / prevent cheating / clean athletes are not disadvantaged; to protect the physical / mental health of those competing / dangers to health; to protect performers who may be pressurised by coaches into taking drugs; to maintain the integrity of their sport / unethical / to avoid sport getting a bad reputation; the scandal of drug taking can lose sponsorship / cause negative media interest in the sport / negative role model; some drugs are illegal and those taking them are breaking the law;	**3**
13(b)	*1 mark for an appropriate effect.* *A further mark if the effect is appropriate to the named physical activity.* *anabolic steroids:* for example in rugby; effect: increase muscle mass; *Accept:* let athletes train harder for longer / increase power / strength / speed up recovery time; *beta blockers:* for example in golf; effect: reduce anxiety; *Accept*: prevents adrenaline action / keeps heart rate low / calming / relaxing effect; *stimulants:* for example in sprint events; effect: increase alertness; *Accept:* reduces the effects of pain / continue through the pain; *Accept sport-specific effects on performance, e.g. able to push harder in rugby scrum (for steroids).*	**6**

Question	Answer	Marks
14(a)	*1 mark for each component.* *A:* trachea; *B:* bronchiole / bronchioles / bronchioli;	**2**
14(b)	*1 mark for each characteristic stated.* *1 mark for each explanation.* *characteristic:* one-cell thick; *explanation:* small distance for oxygen / carbon dioxide / gases to pass through faster; *characteristic:* surrounded by capillaries / blood supply; *explanation:* this increases the amount of blood available for the transfer of gases / maintains concentration gradient; *characteristic:* large surface area / large number of alveoli; *explanation:* large area for gas exchange / diffusion to take place at / more gases can pass through; *characteristic:* walls of 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**
14(c)	*1 mark for each description.* *1 mark for an appropriate change*. *minute ventilation* *description:* the volume / amount of air breathed in / out per minute; *change:* increases; *vital capacity* *description:* the maximum volume / amount of air that can be breathed out after breathing in as deeply as you can; *change:* no change;	**4**

Question	Answer	Marks
15(a)(i)	*1 mark for an explanation that demonstrates the difference between the two types of risk, for example:* for example: perceived risk takes into account an individual's subjective / personal judgement / fear **AND** real risk does not / a real risk is the amount of danger that actually exists not the perception of it; *Accept alternative wording.*	**1**
15(a)(ii)	*1 mark for each risk.* *1 mark for an appropriate strategy to reduce each identified risk.* for example: *real risk:* a falling rock / slipping / banging head / equipment failure; *strategy:* all participants should wear helmets / non-climbers should not stand beneath climbers / wear a helmet even when not climbing / take your time; *perceived risk:* fear of / worry about falling off wall; *strategy:* demonstrate harness / remind participant they are roped / reassure participants / increase experience / provide easier options first;	**4**

Question	Answer	Marks
15(b)	*Physical activities must be different.* *1 mark for an appropriate minor injury.* *1 mark for an appropriate treatment.* *typical minor injuries could include:* winding; simple cuts / grazes; blisters; bruises; strains; sprains; *treatments:* winding: sit in crouched position / take slow deep breaths / loosen tight-fitting clothes if they restrict deep breathing; simple cuts / grazes: clean and cover / apply a plaster; blisters: clean / rest / protect; bruises: apply ice; *Accept other minor injuries and appropriate treatments.*	**4**

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