

CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

0413 PHYSICAL EDUCATION

0413/13

Paper 1, maximum raw mark 80

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 will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Section A

- 1
- Have essential human needs food, clothing and shelter;
 - Have friendship and support;
 - Have some value in society;
 - Able to mix with others;
- [1]
- 2
- An example of a skill that is specific to a particular sport, involves more than one component, requires practice. Examples such as tennis serve, high jump, triple jump etc.
- [1]
- 3
- Have enough sleep;
 - Exercise;
 - Have fun / enjoyment;
 - Eat a healthy diet;
 - No alcohol or drug abuse;
 - Time to relax;
 - No smoking;
- [1]
- 4
- Examples could include Shoulder / Elbow / Knee / Hip
- [1]
- 5
- Provide energy;
 - Controls appetite;
 - Maintains good health;
- [1]
- 6
- Activities will often reflect the needs of the local community;
 - Cost of activities are kept to a minimum or free;
 - Facilities within the community are used / easy access;
 - The local community are able to influence the activities on offer;
 - Provides the community with a greater sense of cohesions;
- [2]
- 7
- Heart disease and high blood pressure / liver damage;
 - Weakened ligaments and tendons;
 - Infertility and cancer;
 - Aggressive behaviour;
 - Growth of face and body hair / deepening of voice in women / acne;
- [2]
- 8
- Rest the performer;
 - Ice the area immediately;
 - Apply ice period of time over 24–48 hours;
 - Raise the limb above the level of the heart;
 - After 2 days apply heat;
- [2]

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- 9**
- Able to train full time / living expenses;
 - Provided with equipment / resources / high quality coaching;
 - Can travel to matches / competitions ;
 - Ensure the use of training facilities / warm weather training etc.;
 - Provides medical support;
 - Can access competitions / games easier / access to high quality competition.
- [2]**
- 10**
- Performer not clear of their role / what is expected / lack of experience;
 - Lack of training so performer knows they are unprepared – include other factors that could impact on preparation;
 - Poor quality coaching results in performer lacking confidence;
 - Pressure on the outcome creates high levels of anxiety;
 - Over confident / opposition not taken seriously / lacking confidence as opposition intimidate.
- [2]**
- 11**
- Hearts – lungs get more efficient at delivering oxygen so you don't get tired so quickly / stronger;
 - Muscles get stronger and contract more efficiently / work for longer;
 - Posture improves;
 - Body fat gets burned so shape is maintained / cholesterol levels lower;
 - Improved joint flexibility;
 - Bones get stronger.
- [2]**
- 12**
- Opportunities to take part in competitive sport / fixtures / regular exercise / easy access;
 - Opportunities to play at a higher level;
 - Can improve skills / fitness;
 - Access to coaching;
 - Improves confidence / self-esteem / reduce stress / able to relax;
 - Have fun / enjoyment;
 - Play with friends / make friends / work cooperatively.
- [3]**

[Total: 20]

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Section B1
Factors affecting performance

- (a)
 - Cartilage – allows smooth movement, prevents friction;
 - Ligaments – holds the bones in place to give stability and movement;
 - Joint cavity – allows fluid to lubricate the joint and prevent friction;
 - Synovial membrane produces synovial fluid to enable smooth movement;
 - Joint capsule protects the joint;**[2]**
- (b)
 - Factors that affect levels of concentration / large crowds / media;
 - Feeling unwell / stomach ache / headache / lack of sleep / diet;
 - Increase in muscle tension;
 - Pressure of performing well / pressure of the prize / event;
 - Lack of confidence when participating due to previous injury;
 - Become over excited and this results in mistakes;
 - Lack of confidence / intimidated by opposition;
 - Over-train causing tiredness;
 - Different environment / equipment;**[3]**
- (c)
 - Heart muscles become weaker;
 - Contractions become weaker / stroke volume decreases / cardiac output decreases;
 - The amount of blood pumped out of the heart is reduced;
 - The amount of oxygen delivered to muscles reduces;
 - The resting heart rate will increase;
 - After any exertion the heart takes longer to recover;
 - Heart starts to collect fat;
 - Increased possibility of heart disease;
 - Blood pressure increases;**[4]**
- (d) (i)
 - Body compensates for the lack of oxygen by increasing the amount of red blood cells / haemoglobin levels increase;
 - Increase the amount of oxygen reaching muscles;
 - When the performer returns to sea level it will enable a performer to run faster / longer and more red blood cells reach the muscles;
 - The athlete may be unable to train because of altitude sickness;
 - When first training at altitude the lack of oxygen may result in an athlete being unable to train / become too tired when altitude training starts;**[3]**
- (ii)
 - Endurance / marathon / long distance running;**[1]**

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- (e) (i)
- A means of applying stress in terms of weights, increased exercise (running) stretching to muscles, joints, cardio-vascular system through different specific exercise;
 - Making the body work harder;
 - The body will adapt to the increase in demand / adaption;
 - Overload can bring about improvements in strength, endurance and mobility;
 - Overload must be progressive;
 - Speed of overload will be determined by the nature of the work undertaken;
 - Overload must be planned;

[1]

- (ii) No mark given for naming a sport
 Mark given for naming a FITT principle and its application, if the application is not applied to the named sport no marks should be awarded.

- Frequency – an example could be weight training – the performer would increase the amount of times they train, however, weight training requires rest periods to allow muscle repair. – weight training uses the whole body so training needs to be initially only once a week but increase to 3–4 times a week;
- Intensity – an example could be distance running – the performer would increase the distance that the athlete trains over, for example an athlete who runs 5000m would train over longer distance to develop muscle endurance. Intensity must be managed to prevent over-training;
 In weight training increasing the weight being lifted / number of repetitions / length of time spent training Only one component should be increased at any one time;
- Type – example could be sprinting – training needs to be specific to the activity – short sprints of high intensity with rest periods to aid recovery / long runs will not develop fast twitch fibres. Use of resistance training pulling a weight while running / sprinting up hill / use of plyometric training to increase power / technical training sprint starts / pick up phase of a sprint;
- Time – an example could be swimming – increase the amount of time spent training / a novice may have training sessions for 30 minutes this would increase for an elite athlete who may train 2/3 times a day. A top swimmer may train 2/3 times a day which would include weight training / cardio vascular in one session plus water based training in another session. Too much time spent training will not provide any benefits;

[4]

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- (f) (i)
- Helps the coach plan a training programme / identify areas of weakness;
 - Compares the results to other performers;
 - Compares the results to previous performance / out of season ;
 - Helps goal setting for an athlete;

[2]

- (ii) 12 minute run / Cooper run
- Mark out a course / use a 400m track;
 - The track should be marked in 100m sections;
 - Start the test and athletes can run or walk for 12 minutes;
 - Athletes should cover as much distance as possible;
 - At the end of the 12 minutes calculate the distance covered;
 - Convert the distance covered onto a score chart to identify the level of fitness / male and female tests;

Multi Stage Fitness test (Bleep test)

- Flat non slip surface needed;
- Mark out a 20 metre space and mark with a cone / marker;
- Use a Multi stage pre-recorded tape;
- Performer must complete the shuttle before the tapes bleep;
- If the athlete fails to complete the shuttle on 3 occasions the test stops;
- The test has 23 levels;
- Test requires a pre – recorded tape;

Candidates can be given credit for using other tests. Example: Harvard Step test

- Step is required 20 cm high;
- The performer steps up onto the bench placing both feet before stepping off;
- 30 steps per minute should be maintained for 5 minutes;
- If the athlete cannot maintain the rate for 15 seconds he should stop;
- On completion of the test the heart rate should be taken;
- The heart rate is put into an equation to provide an index to be put into a standardised chart;

Marks should not be given for just naming a test; marks should be given for the description.

[5]

[Total: 25]

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**Section B2
Health, Safety and Fitness**

- (a)**
- Environment – weather / pitch conditions;
 - Preparation – skill level / amount of practice / diet / fitness level / tactical awareness / poor focus;
 - Equipment correct and in good condition;
 - Clothing- is protective clothing needed / studded boots;
 - Injury free;
 - Performance of others in the team / quality of opposition / difference in skill levels / age range of team ;
 - Communication within the team / encouragement from team players / disputes with members of the team;
- [2]**
- (b)**
- Would build muscle bulk that would not be helpful due to increase in weight;
 - Protein would be used as an energy source which prevents muscle repair from taking place;
 - Lack of source of energy so an athlete would not be able to perform for any length of time;
 - Decrease maximal effort;
 - Reduce glycogen levels in the liver;
 - Increased possibility of cancer illness;
 - Prevents the absorption of vitamins and minerals;
- [3]**
- (c)**
- Ensure the participants have the appropriate level of strength and technique to lift weights / provide demonstration / appropriate age;
 - Ensure the weight being used is appropriate to the individuals
 - Check the equipment is in good condition;
 - Check that participants have appropriate safety clothing – belts / gloves etc.;
 - Ensure the area is not overcrowded / safe to use;
 - Ensure that there is a spotter for everyone lifting weights;
 - Ensure that rules are made known / clearly shown;
 - Make sure that weights are stored safely;
 - Appropriate space between stations;
- [4]**
- (d)**
- (i)**
- Minute Volume – the volume of air that you breathe per minute;
 - Minute Volume = tidal volume × respiratory rate.
- [1]**
- (ii)**
- The greater the volume of air breathed causes an increase in the amount of oxygen reaching the muscles / increase in endurance / more oxygen in the blood;
 - The number of breathes taken increases;
 - The speed of oxygen reaching muscles increases;
 - The amount of carbon dioxide expelled increases;
 - The increase in minute volume slows the onset of Lactic Acid;
- [4]**

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(e) Changes

- The heart rate will increase / blood flow will increase;
- Blood pressure will increase with an increase in blood volume;
- Contracting muscles squeeze on veins sending blood back to the heart quicker;
- The heart will pump out more blood per beat;
- Arterioles will widen;
- Blood will get shunted to where it is needed blood vessels widen and narrow / vasodilation and vasoconstriction take place;
- Increase in the amount of oxygen in the blood / increase in carbon dioxide in the blood;
- Body temperature increases / blood vessels move closer to the skins surface / sweat to maintain body temperature;
- Gas exchange occurs quicker;
- Increase in respiration in the muscles generates more heat so blood gets hotter;
- Breathing is quicker / deeper / lactic acid starts to build up;
- Joints become more flexible;

Effects on performance can include

- Blood flow increasing provides muscles with more energy;
- Increase in oxygen allows muscle to resist the onset of lactic acid / fatigue;
- Arterioles widen to allow more blood to flow to increase the speed and volume of energy to the muscles;
- Increase in the amount of glucose released into the blood stream to provide energy;
- Allows the performer to exercise for longer;

[6]

[Total: 20]

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Section B3

Reasons and opportunities for participation in physical activity

- (a)
- Provide high quality facilities / international standard facilities – 50 m swimming pool;
 - Specialist equipment;
 - High quality / performance coaches;
 - Designated time for high performance performers;
 - Become a centre of excellence / host major events to encourage other elite performers to base themselves at the centre / raise the profile of the centre;
- [2]**
- (b)
- Provide coaches that can teach the curriculum;
 - Provide specialist equipment that schools may not have i.e. swimming pools / weights room / squash courts;
 - Give schools discounts to encourage use;
 - Relax some of the rules;
 - Advertise activities that the centre has to offer;
 - Provide specialist courses i.e. football referees course;
 - Ensure time / space is available for school use during the school day;
 - Host inter school competitions;
 - Be involved in national / local campaigns that support school sport;
- [3]**
- (c)
- Fewer women play sport / less teams / competitions;
 - Traditionally men's sport are higher profile / more popular;
 - Men's sports is usually faster / more physical which can make them more appealing to watch;
 - Less interest in women's sports / viewing figures would be lower for most women's events;
 - Fewer high profile women performers;
 - Men are more often in decision making positions to decide what is shown on television;
 - Men's sport has a greater following;
 - Many sports are new to women so do not have a great following i.e. rugby, boxing;
 - Prize money for men's events higher which attracts greater media interest;
- [4]**
- (d)
- Comply with government legislations;
 - Improve access – ramps / wide doors / automatic doors / hearing loops / lifts / disabled car parking spaces / low level reception areas / free parking / drop off point close to the entrance;
 - Provide a wide range of activities;
 - Ensure changing is made easy – bigger changing cubicles / wheelchair access to showers / toilets / wide and deep steps with handrail;
 - Adaption of equipment – hoists for swimming pools / graduated steps to swimming pool;
 - Provide coaches – coaches with specific knowledge of disability sports / staff aware of disabilities;
 - Provide court time to encourage disability teams / associations to run competitions / competitions with able bodied performers where appropriate;
 - Link with special schools to encourage participation
 - Background music is not played to help performers with hearing difficulties;
 - Equipment in a gym has gaps between to accommodate wheelchair movement;
 - All documentation/ timetables etc. are available in Braille;
- [6]**

[Total: 15]