

MARK SCHEME for the May/June 2014 series

0413 PHYSICAL EDUCATION

0413/12

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 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Section A

- 1 lead a healthy lifestyle ;
eat a balanced diet / eat healthily ;
avoid drugs and pollution ; [1]

- 2 a long / high jumper getting the crowd to clap before the start of the run up ;
getting ready for weight lifting ;
psyching up before a contact sport such as rugby / American Football ; [1]

- 3 raises heart rate / blood pressure ;
causes heart disease ;
blood cells take up carbon monoxide so less oxygen gets to muscles ;
tar collects in the lungs / alveoli which reduces oxygen uptake ;
illness prevents / reduces participation / reduces level of performance ;
causes lung cancer / causes bronchitis / breathing difficulties ; [1]

- 4 ribs ;
joints in the spine / between vertebrae ; [1]

- 5 meet new people / improve social skills ;
meeting people ;
improved awareness of others / team work ; [1]

- 6 facilities are often specific to a sport, e.g. squash club, golf club ;
provide high quality / better equipment / facilities ;
coaching is available, including 1 to 1 / specialised coaches ;
no cost to the community / community can be members and use it / facilities more
accessible to the community ; [2]

- 7 some sports have age restrictions ;
most sports have age categories ;
some sports may be too dangerous for young performers / older people unable to
meet physical demands of sports / very young children may find some skills too
complex or demanding ;
at a young age performers will need transport / help to attend ;
younger participants may want more adventurous activities / older participants more
passive sports / interests change with age ; [2]

- 8 remove any splinters, etc. from the wound / clean wound ;
cover the cut and apply pressure / allow to clot ;
raise the injured limb to reduce the flow of blood to the wound / keep limb still ;
when the bleeding stops apply a pad or plaster ;
get medical help if needed ; [2]

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- 9 the sponsors may make demands on the performer that stops them training/ playing/ less free time due to commitments ;
a sponsor may dictate the events an athlete takes part in ;
sponsorship deals are usually time limited and the athlete may become reliant on sponsorship ;
win at all costs/ cheating, e.g. use of drugs/ has to play well ;
(public) opinion of sponsor may transfer to performer ;
sponsor may dictate clothing/equipment performer may use/may not meet all athlete's needs ;
performer may lose the sponsorship deal if their behaviour becomes unacceptable/ bring the company into disrepute ; **[2]**
- 10 understand the strengths/weaknesses of your opponent/plan to overcome the opponent ;
visualise the event/visualisation/go through intended actions ;
visualise prior success/winning/what to do if things go wrong ;
take deep breaths – helps reduce anxiety/meditation/relax ;
distract from the event by listening to music ;
get psyched up/pumped up/pep talk from coach ; **[2]**
- 11 tiredness/muscle soreness/cannot complete activity ;
lack of motivation/gives up too easily ;
not eating well ;
poor concentration ;
over sensitive to comment/criticism/feeling stressed ;
minor injuries more frequent/illness e.g. colds ;
coach sees athlete training too much ;
no improvements in performance seen ; **[2]**
- 12 students have additional lessons/increased participation ;
access high quality coaching ;
use a wider range of equipment/facilities ;
candidates take part in a wider range of sports/improves fitness/improves performance ;
candidates gain a greater understanding of sports/able to analyse performance ;
candidates gain a wider understanding of diet/physiology/treating injuries, etc. ;
candidates can gain scholarships/go to higher education ; **[3]**

[Total: 20]

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Section B1

Factors affecting performance

- (a) the performer may become more focused on the reward than the reason for performing/more interested in rewards than performing/resorts to cheating/may push too hard leading to injury ;
the reward might be too difficult to attain ;
playing for rewards can put the performer under too much pressure/cause anxiety ;
you may lose interest in a sport if you fail to gain the reward ; [2]
- (b) ball and socket – abduction/adduction/circumduction ;
hinge – flexion/extension ;
pivot – rotation ;
condyloid – flexion/extension ;
saddle – circumduction ;
gliding joint – flexion/extension ; [3]
- (c) the gastrocnemius originates on either side of the knee joint and links with muscles to form the Achilles tendon which has its insertion at the heel/located at back of leg ;
the muscle assists in powerful flexion at the ankle/plantarflexion ;
as the heel hits the ground the gastrocnemius is relaxed ;
brings the person to the balls of their feet ;
this allows the muscle in the shin to contract ;
as the ball of the foot hits the ground, the functions of the muscles reverse/contracts when the athlete takes off ;
the toes push against the ground to enable take off ; [4]
- (d) plasma ;
clear liquid that transports blood cells and platelets/removes waste products/transport nutrients that helps build tissue ;
red blood cells (RBC) ;
transport oxygen from the lungs to tissues/oxygen provides energy to the muscles/the more red blood cells the longer muscles will be able to sustain exercise ;
white blood cells (WBC) ;
part of the immune system/fights bacteria/essential in contact sports when performers can be cut in preventing infection/speeds recovery from injury ;
platelets – acts as a clotting agent when a performer is cut, essential in contact sports ; [4]

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(e) effects:

the cardiac muscle develops thicker, stronger walls which increases the volume of blood in the arteries/improved stroke volume ;
the number of red blood cells increases ;
the amount of capillaries around the heart and lungs increases ;
a more efficient circulatory system ;
arterial walls become more elastic ;
lower resting heart rate ;

improvements:

the increase in volume allows more blood to reach muscle tissue so more energy available ;
improves the amount of oxygen reaching muscles, aiding endurance ;
this allows a speedier movement of oxygen and carbon dioxide which delays the onset of lactic acid production ;
the system is more able to cope with the changes in blood pressure ;
gas exchange improves so the speed that oxygen reaches muscles increases ;

[6]

(f) health:

flexibility/suppleness – a good range of movement at a joint is needed to be able to do a number of movements such as the splits ;
muscle endurance – the ability to repeat contraction, essential in floor exercises ;
strength – muscles need to be able to hold body weight on the rings or pommel horse ;
speed – ability to move body parts quickly essential in most gymnastic movements ;
body composition – ectomorphic/mesomorphic body type required/need for a light body frame/right body frame ;
stamina/cardiovascular endurance – able to sustain effort during floor activities ;

skill:

explosive strength/power – required for explosive movements on the floor exercises/vaults ;
agility – required for changing direction quickly, important on the floor and beam activities ;
balance – able to hold a position on the beam or a balance position on the mat ;
timing – ability to act at the right moment, e.g. in take-off on a vault ;
coordination – able to coordinate routines and movements ;

[6]

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Section B2

Health, safety and training

- (a)** taking some exercise/spend time outdoors ;
balanced diet/eat in moderation/maintain appropriate weight ;
do not smoke/take drugs/drink alcohol in moderation ;
a social life/having friends ;
good sleep patterns/not being tired ;
having a sense of purpose ;
stress free ; [2]
- (b)** wearing protective clothing can ensure the lack of damage to key areas of the body, e.g. shin pads ;
appropriate footwear prevents slipping, e.g. football boots with studs ;
inadequate clothing could cause hypothermia, e.g. in skiing activities/overheating ;
loose/poor fitting clothes could catch on equipment/restricts movements (with the effect of the lack of movement) ;
tight fitting clothes can aid recovery ; [3]
- (c) (i)** eat a healthy and balanced diet so that most energy comes from carbohydrates/carbohydrate loading prior to an event ;
do not eat more than you need, the excess will be stored as fat ;
drink plenty of water before, during (in the case of endurance events) and after the event ;
eat little more protein than is needed for muscle repair and growth if you are training over long periods of time ; [2]
- (ii)** age – a younger athlete will need more energy than a young child ;
gender – males usually need more energy than a female athlete of similar age ;
lifestyle – the more active you are the more energy you will need ;
the type of sport involved – different energy requirement/length of activity/intensity of activity/level of opponent/game ;
body type/build of individual ; [2]

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(d) (i) type of training:

continuous training
fartlek training
interval training

benefits:

develops aerobic fitness/anaerobic fitness ;
good for burning body fat ;
good for activities that require a change of speed ;
easy to monitor progress / easy to adjust ;
no need for specialist equipment / can be done anywhere ;
good for improving all-round fitness quickly ;
can be applied to a range of endurance sports ;
improves the cardiovascular and respiratory systems ;
good for activities that require change of speed / replicate pace of event ;
variety of activities help avoid boredom – fartlek training ;

[3]

(ii) overload:

examples can be accepted that:
increase the amount of time spent training ;
reduce the amount of rest time ;
increase the speed at which training takes place ;

reversibility:

keep the training interesting to avoid tedium ;
plan training over a period of time rather than training at too great an intensity ;
only train / perform when fit and healthy ;
avoid long periods of not training ;

[2]

(e) increase in temperature / muscles become warmer ;

greater blood flow to muscles ;
increase in oxygen uptake ;
contractions take place quicker / stronger / faster ;
a greater number of muscle fibres contract ;
contractions take place with greater force ;
energy is used quicker / muscles become tired ;
glycogen in the muscle is broken down quicker ;
muscles become more flexible / stretch further / are more elastic ;
muscles start to respire anaerobically ;
lactic acid starts to increase in the muscles quickly ;
muscles may become sore ;
injury could result ;

[6]

[Total: 20]

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Section B3

Reasons and opportunities for participation in physical activity

- (a) develop a coaching structure for the sport ;
 provide funding for all levels of performers ;
 develop/build facilities ;
 increase the number/quality of coaches ;
 support schools to develop the sport in the curriculum/identify young talent programmes ;
idea of increasing base/participation in sport/create national teams ; [2]
- (b) opportunities to continue education ;
 easy access to high quality sports facilities/equipment ;
 easy access to high quality coaching ;
 commitment of support for a set period of time ;
 access to appropriate competition ;
 able to focus on sporting improvement ;
 often accommodation provided/no cost to athlete/fees paid or reduced ;
 able to mix with other high quality performers/play at the highest level/professional career in sport ; [3]
- (c) improvement in facilities/equipment available ;
 improvement in the quality of coaching ;
 more athletes train with able bodied athletes and coaches ;
 greater media coverage/greater awareness ;
 more people participating/increase in the number of countries taking part/more role models ;
 more countries creating coaching structures and organisations/new sports ;
 greater acceptance of disability sports ;
 more international events – improved competition ;
 more governments making a financial commitment to disability sports ;
 technical advances in equipment used ; [4]

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(d) **media** – people able to see/hear sports from around the world ;
develop greater understanding through video replays/analysis ;

medical – improvement in medicines means quicker recovery and prevention ;

equipment – improvement in equipment such as running track technology/
swimming pool design, etc. improves times ;

personal equipment – improvements in design and materials improve
performance, e.g. athletic shoes are lighter and stronger/tennis racquets are
lighter and stronger ;

clothing – help prevent injury through improved protection/lighter clothing ;

sports science – more able to measure performance/a greater understanding of
physiology and the effects of exercise on the body helps improve
performance/better detection of drug usage ;

information technology – helps performers access information about
events/communicate with coaches around the world/sharing training
information ;

travel – it has become easier to travel so performers can travel to events/training
camps ;

diet – greater awareness of the impact of the diet on performance/the science of
food ;

domestic technology – time needed to do housework has been reduced
through the development of appliances which give more time for leisure
activities ;

commercial technology – has enabled people to work from home/
flexi-time/less physically demanding work ;

technology – in sport through video refereeing has reduced errors ;

technology – for performers with disabilities improved ;

[6]

[Total: 15]