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General Certificate of Education
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Physical Education 1581

PHED1

Opportunities for and the effects of Leading a Healthy and Active Lifestyle

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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Section A

Question 1

Figure 1 shows how a gymnast pushes up form a headstand to a handstand.

1 (a) (i) Name the main 'agonist' at the elbow joint in the movement from position **A** to position **B.** *(1 mark)*

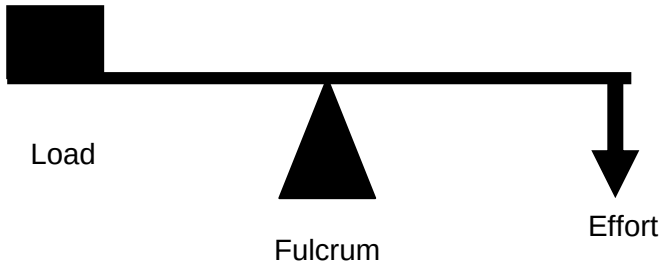
A. Agonist – triceps (brachii)

1 (a) (ii) Name the 'type of muscle contraction' taking place while the gymnast is stationary at position A **and** through the movement phase to position B. *(2 marks)*

2 marks for 2 of:
A. Position A – stationary – isometric
B. Position B – movement – isotonic/concentric

1 (a) (iii) Name, sketch and label the lever system that is operating at the elbow during the movement from **A** to **B.** *(3 marks)*

3 marks for 3 of:
A. First class/order/lever/system
B. Correctly labelled – fulcrum/pivot; effort/force; load/resistance/weight
C. Correct order – Fulcrum/pivot in middle



1 (b) When a gymnast is performing, the physical demands of exercise will cause changes to the gymnast's cardiac output and stroke volume.

1 (b) (i) What are the effects of training on resting 'cardiac output' and stroke volume'? *(2 marks)*

2 marks for 2 of:
A. Cardiac output stays the same/no effect/no change
B. Stroke volume increases/equiv

1 (b) (ii) Explain how rising levels of carbon dioxide cause an increase in cardiac output.

(4 marks)

4 marks for 4 of:

A. Increases acidity/ hydrogen ion concentration/ lowers pH/(in blood);
B. Detected by chemoreceptors;
C. Impulses/information to cardiac centre/ medulla (oblongata);
D. Increased stimulation of sympathetic nerve/decreased stimulation of parasympathetic/vagus nerve;
E. Adrenaline/nor-adrenaline;
F. To S.A.N./S.A node/sino-atrial node;
G. Increase in heart rate;
H. Increase in venous return;
I. Increase in stroke volume/ejection fraction;
J. Starlings Law of the heart

Question 2

For effective performance, games players require oxygen to be delivered to the muscles and carbon dioxide to be removed.

2 (a) (i) State **two** ways in which carbon dioxide is transported by the blood.

(2 marks)

2 marks for 2 of:

A. As bicarbonate/hydrogen carbonate ions/ carbonic acid;
B. Dissolved in plasma;
C. Combined/attached with plasma proteins/haemoglobin / forms carbaminohaemoglobin

2 (a) (ii) Explain how oxygen is taken up by haemoglobin from the lungs and released at the muscle site. *(3 marks)*

3 marks for 3 of:

A. Forms oxyhaemoglobin/Hb O_2
B. At lungs - high partial pressure of O_2/ blood – low partial pressure of O_2;
C. Haemoglobin becomes <u>saturated</u>;
D. At muscles - low partial pressure of Oxygen/ O_2/ blood - high partial pressure of O_2;
E. Hence oxygen <u>dissociates</u> from haemoglobin;
F. Mention of <u>myoglobin</u>.

2 (b) Explain why aerobic training improves the performer's ability to transport oxygen. *(2 marks)*

2 marks for 2 of:

A. More blood volume/haemoglobin/Hb/red blood cells;
B. Increased a-VO_2 diff/more oxygen extracted by muscles;
C. Increased capilliarisation/more capillaries.

2 (c) Explain how a diet containing sufficient 'vitamins' **and** 'minerals' contributes to effective performance. *(2 marks)*

2 marks for 2 of:
A. Vit K/folic acid/Vit B12/iron - helps production of red blood cells/ haemoglobin;
B. Calcium/phosphorus /Vit D for bones;
C. Calcium / magnesium for muscle contraction;
D. Vit B2/niacin/phosphorus/sodium/iron – energy metabolism;
E. Potassium/sodium/calcium – nerve transmission

2 (d) Explain the mechanics of breathing which allow a performer to fill the lungs with air during exercise. *(3 marks)*

3 marks for 3 of:
A. Diaphragm/intercostal muscles contract/ flattens;
B. Lungs/ribs also pulled upwards and outwards;
C. Lungs attached to pleural membranes;
D. Volume/size of chest/thoracic cavity/lungs increases;
E. Reducing pressure within lungs;
F. Air sucked in;
G. During exercise other muscles – strernocleidomastoid / scalenes and pectoralis minor increase action;

Question 3

When learning a skill such as triple jumping, performers will use their abilities to improve their level of skill.

3 (a) Briefly explain the terms 'ability' **and** 'skill'. *(2 marks)*

2 marks for 2 of:
A. Ability - innate/inherited/born with/ genetic;
B. Skill – learned;

3 (b) The skill of triple jumping can be classified according to various skill continua. Classify the triple jump according to the following continua, justifying each of your choices:

- open to closed
- self-paced to externally paced
- discrete to continuous *(3 marks)*

3 marks for 3 of:
A. Closed – unchanging environment/few decisions;
B. Self-paced – performer decides when to start and how fast to perform/ can be externally-paced – limited time to perform;
C. Discrete – distinct beginning and end/ serial-contains separate skills;

3 (c) Name the **four** stages of Bandura's model of observational learning. Using examples, explain how a coach may use this model to teach the correct technique for skills such as triple jumping. *(4 marks)*

4 marks for 4 of:
A. Attention, retention, motor production, motivation;
B. Attention - highlight the key areas of the skill/focus/concentrate;
C. Retention - performer able to remember information/keep mental image;
D. Motor (re)production - physically capable of performing skill;
E. Motivation - drive/desire/use of rewards/praise by coach;

3 (d) What **other** factors should a coach consider for a demonstration to be effective? *(3 marks)*

3 marks for 3 of:
A. Perfect/accurate demonstration
B. Frequent practices/rehearsals/over-learning;
C. Minimal delay between demonstration and practice;
D. Highlight cues/verbal repetition of key learning points;
E. Emphasise need to feel correct movements/attend to kinaesthesis;
F. Use of imagery/mental practice/ rehearsal;
G. Transfer from previously learned skill;
H. Fun/enjoyable/relevant/realistic/interesting;
I. Demonstration by role model/significant other/similar age/ability;
J. Audience can see/hear;
K. (With complex skill) – use different angles/ slo-mo/video/repeat demonstration;

Question 4

For effective performance, games players require the ability to receive, interpret and use information.

Figure 2 shows the relationships between the memory stores in a simple information processing model.

4 (a) (i) Selective attention is an important part of information processing. Using **Figure 2**, identify where 'selective attention' occurs **and** explain how it aids performance. *(3 marks)*

3 marks for 3 of:
A. Short term sensory store/between STSS and STM;
B. Responsible for selecting relevant information (credit appropriate eg);
C. From irrelevant information (credit appropriate eg);
D. Speeds up decision-making/reaction time/response time/allows to keep information in STM for longer;
E. To prevent information overload;

4 (a) (ii) How can a coach improve a player's selective attention? *(3 marks)*

3 marks for 3 of:

A. Cue identification/direct attention to one aspect of performance/highlight cues/ direct focus;
B. Increase intensity of the stimulus/allow egs such as brighter ball;
C. Motivate/arouse the performer;
D. Referring to past experiences/ transfer of skill from one situation to another;
E. Learn to ignore irrelevant stimulus/ practice with distractions;
F. Make stimulus meaningful or unique;

4 (b) (i) Performing a skill involves 'movement time', 'response time' and 'reaction time'. What is the relationship between these three time phases? *(1 mark)*

A. Response time = reaction time + movement time

4 (b) (ii) Identify the factors that could affect a games player's response time. *(5 marks)*

5 marks for 5 of:

A. Type of stimuli – sound fastest;
B. (Previous) experience/anticipation of the movement (accept reverse);
C. Gender – Males have shorter/quicker response times than females;
D. Age – response time decrease with age;
E. Intensity of the stimulus – ball colour/ speed of delivery;
F. Concentration levels/distractions/ selective attention/stimulus overload;
G. Playing environment – surface/weather/ lighting;
H. Physical fitness/injury/fatigue;
I. Duration of the movement/reaction time/ number of choices/stimuli/Hicks law;
J. Level of arousal/drugs/alcohol/state of mind/anxiety;
K. Psychological refractory period/ deception/faking from opposition;
L. Stimulus-response compatibility;
M. Length of neural pathways;

Question 5

Figure 3 shows an indoor ski slope.

5 (a) Indoor ski slopes are an example of an urban adaptation of an outdoor and adventurous activity.

Give **two** other examples of outdoor and adventurous activities **and** state how **one** of these could be adapted within an urban environment. *(2 marks)*

2 marks for 2 of:

Activity	**Adaptation**
A. Climbing/abseiling/mountaineering/ hill/walking/ hiking/rambling	B. Climbing wall;
C. Orienteering	D. Park/school grounds;
E. Canoeing/rafting/kayaking	F. Swimming pool/lake/ canals/ reservoir;
G. Windsurfing/ sailing/scuba diving	H. Lake/reservoir/gravel pits;
I. Mountain biking	J. Country parks/ parks/indoor tracks;
K. Caving	

5 (b) Participation in outdoor and adventurous activities in the natural environment involves an element of risk. What is the difference between 'real risk' and 'perceived risk'? (*3 marks)*

3 marks for 3 of:

Real risk

A. From natural environment/avalanche/ rough sea/bad weather, etc/ increases with skill level;
B. Should be avoided at all costs;
C. Risk of life/injury/dangerous;
D. Can be planned for/plan a route to avoid;

Perceived risk

E. Sense of danger/think there's a risk, eg scared of heights;
F. Provides excitement/adrenaline rush, but controlled, eg harnesses;
G. Encouraged by leaders/learning experience based on skill level;
H. Importance of developing risk assessments;

5 (c) The Sport England Active People Survey of 2006 showed that approximately 9% of people with a disability participate regularly in sport compared with 23% of the rest of the population.

5 (c) (i) Suggest reasons for this lower participation rate for people with a disability. *(4 marks)*

4 marks for 4 of:

A. Safety concerns/medically considered dangerous;
B. Stereotype/lower expectations by society;
C. Self perception/low self esteem/feel inferior/less confident;
D. Lack of specialised coaches/trained staff;
E. Lack of specialist/adapted/suitable or equivalent facilities/ access ramps/ equipment
F. Discrimination;
G. Lack of competition/clubs/teams
H. Lack of: mobility/transport/disposable income;
I. Lack of information/poor media coverage/ lack of role models;

5 (c) (ii) Opportunities for people with disabilities to participate in 'competitive sport' have increased in recent years. Give reasons for this increased opportunity. *(3 marks)*

3 marks for 3 of:

A. Equal opportunities/less discrimination/ Disability Discrimination Act;
B. Adapted activities/modified activities/own sports/ technological advancements
C. Increased expectations of disabled people/raising standards of performance eg Paralympics;
D. More knowledge of coaches/trained staff;
E. Organisations such as Disability Sport England/Sport England/English Federation of Disability Sport/specialised governing bodies;
F. Growth in clubs/mainstream school – PE lessons;
G. Media/increase in role models;

Question 6

There are many influences which impact on an individual's participation in sporting and recreational activities.

6 (a) Name **three** 'policies' that Sport England has developed to encourage increased participation in sport. *(3 marks)*

3 marks for 3 of:

A. Support Government's 5 hour public service agreement/5 x 60 in Wales
B. Active Programme/Active schools/Active communities/Active sports/World class;
C. National Junior Sport Programme (Tops programme – Top Tots/Top Play/Top Sport/Top Skill);
D. Sports Colleges/PESSCL/PESSYP/ School Sport Co-ordinators/ PESS/ FESCO/Sports ambassadors
E. Activemark/Sportsmark/clubmark;
F. Coaching for Teachers;
G. Sport Action Zones/Area Action Plans;
H. Sports Development Officers;
I. Development fund (to target specific groups such as women);
J. Plan/develop sport facilities according to need of a local area;
K. Grow sustain excel/Stay, Start, Succeed/ More people, more places, more medals;
L. Playground to podium/step into sport

6 (b) Why has the government in the United Kingdom (UK) become increasingly involved in developing specific policies to encourage participation in sport? *(4 marks)*

4 marks for 4 of:

A. Sport seen as important part of society/people expect it/popular political vote;
B. Wanting more control of sport/how money is spent/revenue/taxes from sport;
C. Contributes to education policies;
D. Increased (psychological) health/fitness/ obesity;
E. Effects on productivity/reduces demand on NHS;
F. Social control/reduced crime;
G. Employment opportunity
H. Increase numbers of medal winners/ patriotism/National pride/feel good factor/ positive society;
I. Inclusiveness/reduce social exclusion/ equal opportunities;

6 (c) Explain how school provision can influence future participation in physical activities. (*5 marks)*

5 marks for 5 of:

A. Amount of curriculum time/variety of activities;
B. Extra-curricular activities/clubs/teams;
C. School tradition/teachers' influences;
D. Location – rural/urban;
E. Facilities/resources/etc;
F. Different roles/critical performer/ leadership/officiating/coaching;
G. School-club links/PESSCLs/PESSYP/ SSCo's/PLT/dual use facilities;
H. National Curriculum;
I. Gifted and talented
J. Health/fitness benefits recognised;
K. Lifelong learning/lifetime sports/active lifestyle;

Section B

Question 7

You have been asked to improve the skills of a group of AS level Physical Education students.

Explain why a warm-up is needed to start the session. What factors need to be considered before deciding whether to teach a skill by progressive part practice?

(12 marks)

A good answer must address both parts of the question adequately, and should consider accurately the following topic areas:

- Reasons for a warm-up, addressing points such as:

A. Reduces possibility of injury/ increase flexibility/elasticity of muscle tissue;
B. Release of synovial fluid/elasticity of connective tissue;
C. Increases body/muscle temperature;
D. Better oxygen delivery/ blood flow/ vasodilation to muscle tissues;
E. Better chemical reactions/higher metabolism;
F. Increased sensitivity of nerve receptors/ speed of nerve conduction/reaction time;
G. Allows for rehearsal of movement/ same skills as in activity;
H. Mental rehearsal/stress or anxiety reduction/psychological preparation/ relaxation/alertness
I. Supplies adequate blood flow to heart so increasing its efficiency;

- Factors to be considered when deciding whether to teach by progressive part practice, addressing points such as:

J. Explanation of progressive part/learn first stage, then add second stage then add third stage/'Chaining';
K. Depends on nature/type of task/skill;
L. Use part if skill can be broken down into parts/complex;
M. Serial skills;
N. Whole for simple/rapid/ballistic movements;
O. Progressive part or whole to gain 'feel'/kinesthesis/loss through part;
P. Part if element of danger;
Q. Depends on stage of learning
R. Whole for experienced/part for novice;
S. Depends on level of motivation;
T. Part is time consuming;

The following table should be used to determine the mark.

Band Range	**Band descriptors**
10-12 Level 4	• Addresses all areas of the question, demonstrates a wide range of depth and knowledge • Has accessed at least 14 points from the mark scheme • Expresses arguments clearly and concisely • Few errors in spelling, punctuation and grammar, correct use of technical language
7-9 Level 3	• Addresses most areas of the question, demonstrates a clear level of depth and knowledge • Has accessed at least 9 points from the mark scheme • Attempts to express arguments clearly and concisely • Few errors in spelling, punctuation and grammar, correct use of technical language although sometimes inaccurately
4-6 Level 2	• Addresses some aspects of the question but lacks sufficient depth and knowledge • Has accessed at least 5 points from the mark scheme • Limited attempt to develop any arguments or discussions, normally vague or irrelevant • Errors in spelling, punctuation and grammar, limited use of technical language
1-3 Level 1	• Addresses the question with limited success • Has accessed at least 1 point from the mark scheme • Has accessed at least one point from the mark scheme • Major errors in spelling, punctuation and grammar, little use of technical language