



**General Certificate of Education (A-level)
January 2011**

Physical Education

PHED1

(Specification 2580)

**Unit 1: Opportunities for and the effects of
leading a healthy and active lifestyle**

Post-Standardisation

Mark Scheme

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Section A

Applied Exercise Physiology

Question 1

- 1 (a) (i) What are the names of the ‘articulating bones’ of the knee joint? (2 marks)

2 marks for 2 of:

- A. *Tibia*;
B. *Femur*.

First two answers
Do **not** accept fibula/patella/fibia/tibula

- 1 (a) (ii) In **Figure 1**, what ‘joint action’ takes place at the knee of the kicking leg in the movement from position **A** to position **B**? (1 mark)

- A. *Extension*.

First answer only
Accept flexion to extension

- 1 (a) (iii) What is the name of the main ‘agonist’ that causes this action in **Figure 1**? (1 mark)

- A. *Quadriceps/rectus femoris*.

First answer only
Do **not** accept quads
Accept **all** four muscles (v-intermedialis **and** v-medialis **and** v-lateralis **and** rectus femoris)

- 1 (b) State **two** classes of food that are most suitable for players who require stamina **and** why they are needed in their diet. (3 marks)

3 marks for 3 of:

- A. *Carbohydrates/glucose/sugar*;
B. *Fats/lipids/triglycerides*;
C. *Energy/ATP/respiration*.

First two food groups only
Do **not** accept carbs
Do **not** accept protein
Do **not** accept fuel

- 1 (c) (i) Use the information in **Figure 2** to explain how oxygen and carbon dioxide move between the two locations. (3 marks)

3 marks for 3 of:

- | | |
|---|---|
| A. Process of <u>diffusion</u> – high to low concentrations/down a concentration gradient/partial pressures/pO ₂ ; | Diffusion named and explained
Some detail of differences shown in figure 2 |
| B. Oxygen partial pressure/pO ₂ higher in alveoli (104)/lower in capillary (40)
OR Carbon dioxide partial pressure/pCO ₂ lower in alveoli (40)/higher in capillary (46); | Identifying direction of movement of <u>both</u> gases |
| C. Gases move – oxygen from alveoli to capillary <u>and</u> carbon dioxide from capillary to alveoli. | Accept blood as alternative to capillary and lungs for alveoli |

- 1 (c) (ii) The alveoli provide the lungs with a large surface area for diffusion.

Name **two** other structural features of the lungs that assist diffusion.

(2 marks)

2 marks for 2 of:

- | | |
|--|---|
| A. Large blood supply; | Accepts lots of capillaries |
| B. Thin/semi-permeable membrane for diffusion/one cell thick/walls are thin; | Do not accept capillary on own
Accept named membrane (alveolar/capillary) |
| C. Short distance for diffusion; | Accept short diffusion pathway |
| D. Layer of moisture; | Accept moist |
| E. Slower blood flow/transit time. | |

Question 2

2 (a) (i) How is 'Body Mass Index' (BMI) calculated? (2 marks)

2 marks for two of:

- | | |
|---|--|
| A. <i>Height and weight/mass;</i> | First two answers
Accept kg and m |
| B. <i>Weight divided Height²/ squared.</i> | Accept Kg/m ²
Just point B = 2 marks |

2 (a) (ii) How may 'obesity' affect performance in different activities? (2 marks)

- | | |
|---|---|
| A. <i>Limits stamina/endurance/cardio-vascular/cardio-respiratory endurance;</i> | Not other fitness components
Accept accurate definitions of components |
| B. <i>Limits flexibility/mobility;</i> | |
| C. <i>Limits agility/speed/power;</i> | |
| D. <i>Causes cancer/heart disease/heart attacks/diabetes/high cholesterol/high fats/high lipids in blood/atherosclerosis/(osteo)arthritis/high blood pressure/hypertension/stroke/lung disease/liver disease/gall bladder disease/gout/(deep vein) thrombosis/psychosocial problems/depression.</i> | Any relevant technical word |

2 (b) (i) Briefly explain the terms 'cardiac output' and 'stroke volume', **and** the relationship between them. (3 marks)

3 marks for 3 of:

- | | |
|---|--------------|
| A. <i>Cardiac output – 'the volume/amount of blood pumped from <u>heart/ventricle</u> in one minute;</i> | Accept equiv |
| B. <i>Stroke volume – 'the volume/amount of blood pumped from the <u>heart/ventricle</u> in one beat;</i> | Accept equiv |
| C. <i>Cardiac output = stroke volume x heart rate/Q = SV x HR.</i> | |

2 (b) (ii) Use **Figure 3** to explain the term cardio-vascular drift. (3 marks)

3 marks for 3 of:

- A. Cardio-vascular drift starts after 10 mins;
- B. Heart/pulse rate increases/beats more and decrease stroke volume/ejection fraction
- C. Fluid lost as sweat; Accept sweating, but **not** cooling
- D. Reduced plasma/blood volume/increase viscosity;
- E. Reduced venous return;
- F. Starling's Law;
- G. Cardiac Output also increases due to more energy needed to cool body/sweat. Cardiac output increase explained

2 (b) (iii) Explain how it is possible for a trained performer and an untrained performer to have the same cardiac output for a given workload. (2 marks)

2 marks for 2 of:

- A. Different sized hearts/hypertrophy – trained bigger; Accept converse, but must be explained
- B. Different stroke volumes – trained bigger; Accept converse, but must be explained
- C. Different heart rates – untrained higher; Accept converse, but must be explained
- D. Can only occur at sub maximal workloads;
- E. At higher workloads untrained will not be able to increase their heart rate sufficiently;
- F. Different physiques/size/mass – untrained bigger.

Skill Acquisition

Question 3

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

2 marks for 2 of:

- A. Ability – innate/born with/genetic/
inherited; Do **not** accept natural
- B. Skill is learned.

3 (a) (ii) What are the characteristics of a skilled performance? (3 marks)

3 marks for 3 of:

- A. Consistency/repeatable success/few mistakes/maximum certainty;
- B. Efficiency/minimisation of time/quick;
- C. Coordinated/controlled;
- D. Fluency/flowing/smooth;
- E. Adaptable;
- F. Minimal outlay of energy/appears effortless/economic;
- G. Aesthetically pleasing;
- H. Goal orientated behaviour/
predetermined results/objective;
- I. Precise/Accurate/Correct.

- 3 (b)** Explain the term ‘insight learning’ **and** suggest how this approach could have a positive effect on learning to long jump. (3 marks)

3 marks for 3 of:

Insight learning -

- | | |
|---|--|
| A. <i>Involves cognitive processes/development</i> | Cognitive = key word
Need to ‘think’ |
| B. <i>Understanding the process to achieve the result/why/reasons you do things;</i> | Understanding = key word
Accept eureka moment |
| C. <i>Coach questions performer about why they’re performing in a particular way</i> | |
| D. <i>Experiences the ‘whole’ activity rather than skills in isolation;</i> | Whole = key word |
| E. <i>Allows learners to develop their own strategies and/or routes of understanding;</i> | |
| F. <i>Better for the performer rather than being told what to do all the time;</i> | Must follow from the correct insight learning theory |
| G. <i>Performer able to adjust movements as required;</i> | |
| H. <i>Improves motivation.</i> | |

- 3 (c)** Describe how the type of feedback being used by a long jumper differs between the early stage of learning **and** the final stage of learning. (4 marks)

4 marks for 4 of:

- | | |
|---|--------------------------------------|
| A. <i>Identified stages – cognitive <u>and</u> autonomous;</i> | |
| <i>Cognitive/early –</i> | <i>sub max 2 marks</i> |
| B. <i>Extrinsic/coach/augmented;</i> | <i>Not internal and not external</i> |
| C. <i>Knowledge of Results/KR;</i> | |
| D. <i>General/simple/basic/positive;</i> | |
| E. <i>Immediate;</i> | |
| F. <i>Terminal;</i> | |
| G. <i>Receive intrinsic feedback/ kinaesthetic but cannot use it;</i> | |
| <i>Autonomous/final –</i> | <i>sub max 2 marks</i> |
| H. <i>Intrinsic/kinaesthetic/correct own mistakes;</i> | |
| I. <i>Knowledge of performance/KP;</i> | |
| J. <i>Specific/detailed/critical/ negative</i> | |
| K. <i>Can be delayed;</i> | |
| L. <i>Concurrent/continuous.</i> | |

Question 4

4 (a) (i) Describe what is meant by the term ‘positive transfer of learning’. (1 mark)

A. *Positive transfer – enhances/helps/ aids the learning of a new skill/egs.* Do not accept a positive effect

4 (a) (ii) Name **and** explain **three** other forms of transfer of learning that can take place. (3 marks)

3 marks for 3 of:

- A. *Negative – hinders learning of new skill;* Answers must involve skills, **not** sports
B. *Bilateral – skill transferred from one side to another/limb to limb;*
C. *Zero – no transfer;*
D. *Proactive – learned skill has affect on future skill;*
E. *Retroactive – learned being skill has affect on past skill.*

4 (a) (iii) How can a coach make sure that successful transfer of learning takes place? (3 marks)

3 marks for 3 of:

- A. *Coach makes performer aware of transfer potential/highlight elements of skill that are similar;*
B. *Identify elements that may hinder learning;*
C. *Ensure original task is well learnt/ practice;*
D. *Planned progression;*
E. *Make practice sessions realistic/ relevant to the competitive environment;*
F. *Eg practicing against opposition/time/ equiv;*
G. *Eliminate bad habits;*
H. *Performer is well motivated/ confidence.*

4 (b) (i) What are the characteristics of an open loop control system? (2 marks)

2 marks for 2 of:

- A. *Pre-planned/well learnt movement/without conscious control/stored as memory trace;*
- B. *Once initiated no modification;*
- C. *No feedback during movement/only after movement*
- D. *Very quick/limited time/ballistic movements;*
- E. *Carried out in a stable/predictable environment/closed skills.*

4 (b) (ii) Explain why an open loop control system is not applicable to all types of skills. (3 marks)

3 marks for 3 of:

- A. *Too many stored movements required for memory capacity;*
- B. *Not all environments are predictable or stable;*
- C. *Cannot accommodate new or novel skills;*
- D. *Cannot accommodate flexible movement pattern;*
- E. *Not applicable to open skills;* Accept suitable examples
- F. *Many skills have time for feedback during performance/allows corrections.* Accept suitable examples

Opportunities for Participation

Question 5

- 5 (a) Using **Figure 5** and your own knowledge, outline the characteristics of rational recreation. (4 marks)

4 marks for 4 of:

- A. Played regularly/free time/middle & upper classes/boys in school;
- B. Complex, written rules/number of players/boundaries/time
- C. Highly structured/administrative/ NGBs/levels of competition;
- D. Teams are wearing kit/division of labour/positional roles/strategies/ tactics;
- E. Technological aspects such as ball/goal posts/equipment;
- F. Skills based;
- G. Moral values/etiquette/code of conduct;
- H. Spectator development;
- I. Officials;
- J. Urban development.

- 5 (b) Using **Figure 6** and your knowledge of the programme Moving and Growing, describe the similarities **and** differences between this programme and the concept of 'play'. (4 marks)

4 marks for 4 of:

Similarities sub max 3

- A. Intrinsic/fun/enjoyment
- B. Learning through movement
- C. Interaction with other children/social development
- D. Problem solving/creative/decision making/cognitive development
- E. Negotiation with others/ communication.

Differences in picture

- F. Freedom of movement/free space
- G. Teacher guiding the task/adult authority/children told what to do sub max 3
- H. Formal educational objective
- I. Less choice/less spontaneous/ compulsory lesson (accept reverse);
- J. Kit/uniform/apparatus.

- 5 (c)** How can schools and community sports clubs work together to increase participation in physical activity? (4 marks)

4 marks for 4 of:

- A. Publicise/advertise/notice boards;
- B. Increase links between the two/visits/liaison/school-club links/personnel/coaches;
- C. Dual use/sharing facilities;
- D. Local/Government policy/eg PESSCLS/sports colleges/sport development officers/SSCOs;
- E. Offer discounts/membership/subsidised use of facilities/youth sections;
- F. Offer (increased) range of activities/roles/extra curricular activities;
- G. Come and try days/taster sessions/holiday scheme;
- H. Increased awareness of health and fitness issues.

Question 6

- 6 (a) (i)** What are the **three** key aims of Sport England? (1 mark)

- A. *Grow, Sustain, Excel or Start, Stay, Succeed;* Must get all terms from either set of three

- 6 (a) (ii)** Why has the UK Government 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. *Improves health/fitness of the population/concerns over obesity/prevention better than cure/prevents strain on NHS;*
- C. *Helps prevent crime/social control;*
- D. *Increase medal winners/national pride/feel good factor/standard of elite/talent ID;*
- E. *Creates employment/gives people life skills;*
- F. *Contributes to education policies;*
- G. *Part of system of governments joined up policies;*
- H. *Wanting more control of sport/how money is spent/revenue from sport;*
- I. *Social-cultural policies/integration of society/equal opportunities/regeneration;*
- J. *2012 Olympics.*

- 6 (b)** What are the advantages **and** the disadvantages for the general public of more private fitness clubs opening? (4 marks)

4 marks for 4 of:

Advantages

- A. *More choice;*
- B. *Better/more up to date facilities;*
- C. *Personal trainer/more expertise;*
- D. *More opportunities to keep fit;*
- E. *Special deals for customers/family membership.*

sub max 3

Idea is can go public or private

Equipment freely available

Disadvantages

- F. *More costly;*
- G. *Too expensive for some/elitist;*
- H. *Less numbers/‘get out’ for local authorities/public providers;*
- I. *Public services suffer.*

Sub max 3

- 6 (c)** Give **three** reasons for the lower participation rates among some ethnic minority groups. (3 marks)

3 marks for 3 of:

- A. *(Racial) discrimination/prejudice;*
- B. *Not encouraged/actively discouraged by parents/peers;*
- C. *Low status/priority given to sport;*
- D. *Links to lower socio-economic status/finance/transport;*
- E. *Conflict with religious customs/observance/dress code;*
- F. *Lack of role models/lack of media coverage/fewer coaches;*
- G. *Stereotyping/channelling.*

Fear of discrimination
Accept preference for academic work

Misconception that certain ethnic groups suit certain activities

Section B

Question 7

You have been asked to develop a training programme to improve the fitness and skills of a group of AS level Physical Education students.

Identify the main reasons for conducting fitness tests and discuss the possible limitations of fitness testing.

In addition, describe the factors that you would consider when deciding whether to use 'massed practice' or 'distributed practice' to develop skills.

Main reasons:

- A. *Identify strengths and/or weaknesses in a performance/success of a training programme/show improvement;*
- B. *Physiological potential/identifies (starting) level of fitness/some (maximal) tests increase fitness/aid training;*
- C. *Compared against norms of the group;*
- D. *Helps motivate performer/sets goals;*
- E. *Provides variety to training programme;*

Limitations:

- F. *They are not sport specific/too general;*
- G. *They do not replicate movements of activity;*
- H. *Do not replicate competitive conditions required in sports;*
- I. *Many do not use direct measuring/sub-maximal – therefore inaccurate/some need motivation/some have questionable reliability;*
- J. *Tests used often/may lack validity/eg;*
- K. *Validity – test what they are supposed to test;*

Factors concerning performer that affect decision:

- L. *Stage of learning – Massed for experienced or autonomous performer/distributed for novice or cognitive performer;*
- M. *Fitness – Massed for very fit performer/distributed for less fit;*
- N. *Motivation – Massed for highly motivated performer/distributed for less motivated*

Factors concerning task that affect decision:

- O. *Complexity – Massed for simple skills/distributed for complex/strenuous;*
- P. *Continuity – Massed for discrete skills/distributed for continuous skills;*
- Q. *Muscles used – Massed for fine skills/distributed for gross skills;*
- R. *Time available – Massed when time is limited/distributed when plenty of time available;*
- S. *Speed of action – Massed for quick/rapid skills/distributed for long-lasting skills;*
- T. *Safety – Massed when no danger/distributed when potential danger.*

Band/Level Descriptors

LEVEL ACHIEVED	NO OF CORRECT RESPONSES	DISCRIMINATOR	INITIAL MARK	OPTIONAL QWC/ COVERAGE	POTENTIAL FINAL MARK
4	13+	15+ items	11	+1	11 or 12
		13 or 14 items	10	+1	10 or 11
3	9-12	11 or 12 items	8	+1	8 or 9
		9 or 10 items	7	+1	7 or 8
2	5-8	7 or 8 items	5	+1	5 or 6
		5 or 6 items	4	+1	4 or 5
1	1-4	3 or 4 items	2	+1	2 or 3
		1 or 2 items	1	+1	1 or 2
	0				0

Band Range	Band descriptors
10-12 marks Level 4	<ul style="list-style-type: none"> 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 marks Level 3	<ul style="list-style-type: none"> 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 marks Level 2	<ul style="list-style-type: none"> 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 marks Level 1	<ul style="list-style-type: none"> 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
0 marks Level 0	<ul style="list-style-type: none"> Addresses no aspect of the question