



General Certificate of Education

Health and Social Care

8621/8623/8626/8627/8629

**HC13 The Role of Exercise in Maintaining
Health and Well-Being**

Mark Scheme

2010 examination - January series

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GCE Health and Social Care HC13 January 2010 Mark Scheme

1

- ai) Ref to Glynis having poor stamina – endurance AW(1) due to inefficient AW oxygen uptake Not air(1) poor AW transport to cells/tissues/muscles (1) reduced AW cellular respiration – energy release (1) max 3 3 marks

Allow any example demonstrating poor endurance such as tires easily – quickly/unable to do housework – carry shopping for long periods (1) 4 marks

- a ii) Any four of: increased ability for diffusion of oxygen into the blood/increased lung capacity surface area (1) increased oxygen carrying capacity of her blood (1) reduced stress on her heart / lowered blood pressure(1) lowered pulse rate (1) increased stroke volume of her heart AW (1) improved arterial wall elasticity AW (1) increased capillaries in her lungs/muscles (1) larger/stronger skeletal muscles (1) max 4 4 marks

- bi) Ref to dynamic strength as high speed muscle contractions AW (1) while overcoming resistance (1) by exerting force (1) Allow ref to dynamic strength as power (1) max 3 3 marks

Allow any two suitable examples-sprinting/jumping/weight lifting/throwing/ cycling for 2 marks Not running/swimming 5 marks

- bii) Ref to mobility as the ability to move (1) with speed (1) balance (1) and/or endurance AW (1) max 3 3 marks

- biii) Ref to Glynis may exercise in a group/team/social interaction/support/contact/in the presence of others-allow example-gym/leisure centre/swimming pool (1) provides opportunities to meet **new** people (1) to develop her social skills/communication/inter-personal(1) forming new relationships/friendships (1) develop existing relationships/friendships (1) max 4 4 marks

Total 20 marks

2

- a) Ref to medical checks/expert advice AW (1) to set limits for activities/prevent over exertion AW/ensure no underlying medical problems (1) wearing appropriate clothing and footwear/using suitable equipment (1) to avoid injury/accident/overheating/ease of movement (1) : using **monitoring** equipment when exercising (1) to prevent over exertion AW/set appropriate targets (1)

Max 2 practice + 2 limited reasons
4 marks

- bi) Answers are likely to point out that regular exercise can control stress by helping physically and mentally. The effects being achieved by regular exercise helping to lower anxiety AW/clear the mind/improve sleeping pattern/improve concentration span/improve decision-making/reduce blood pressure/help prevent indigestion/help prevent palpitations and 'muscular' aches and pains so the individual is able to meet the challenges of everyday life. Relevant explanations of emotional effects brought about by mood enhancement/caused by chemicals/endorphins AW/ secreted by nerves/in pituitary gland in the brain. Physical effects resulting from improved cardiovascular/circulatory function AW improved muscle strength and stamina.

Mark Ranges

0 marks

No response worthy of credit

1-3 marks

Answers that show some relevant knowledge of stress control but are brief and superficial, lacking in structure and may be repetitive e.g. repeated coverage of lowering anxiety/reduced worries/feeling less stressed. These answers will tend to concentrate on the emotional and omit physical effects. There will be little use of technical terminology and effects tend to be simply stated rather than explained.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

4-6 marks

Answers that are organised, presenting a reasonably coherent explanation of how the effects are achieved. There may be some lack of detail but the answers will cover both physical and emotional effects using some relevant technical terminology.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

7-8 marks

Answers are well structured, explaining in good detail how the different physical and emotional effects are brought about. Relevant technical terminology is correctly used.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

8 marks

- bii) Answers are likely to point out that regular exercise can delay rather than prevent some of the physical loss of capacity caused by ageing. Specific effects are likely to include delayed loss of body system/organ effectiveness in the respiratory/circulatory/digestive/musculo-skeletal systems AW.

Maintained lung function in terms of external respiratory efficiency/gas exchange AW/cardiac output relating to stroke volume/circulatory efficiency by resisting

atherosclerosis AW/delayed loss of stamina/muscular strength/flexibility. Regular exercise reducing protein depletion of muscles/maintaining ligaments and preserving muscle flexibility/bone density maintained/through calcium deposition/reduced risk of osteoporosis/blood pressure reduced/less risk of thrombosis AW/blood cholesterol decreased/metabolic rate maintained.

Mark ranges

0 Marks

No response worthy of credit

1-3 marks

Answers show some relevant knowledge of the effects of ageing but tend to state some of the possible effects of regular exercise rather than explain them. Answers will be brief, lacking detail and may suggest that ageing effects can be prevented rather than delayed.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

4-6 marks

Answers present a reasonably coherent account explaining in some detail how the effects of ageing may be delayed. There will be some relevant technical terminology e.g. cardiac function may refer to heart muscle strength being maintained but not explaining stroke volume and/or cardiac output.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

7-8 marks

Answers are coherent and well-structured explaining in good detail how the different effects of ageing may be delayed e.g. cardiovascular function maintained by stroke volume (blood volume per contraction) being preserved and ventricle contractions staying powerful. Relevant technical terminology is correctly used.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

8 marks

Total 20 marks

3

- ai) Peak Flow
 Adult W – below normal result (1) may be least fit/asthmatic/respiratory problem
 (1) Adults X/Y/Z – in normal range – 1 each (3) Allow Adult Z may be biggest/Y
 smallest. Not relative fitness X/Y/Z(1) Max 4 4 marks
- a ii) BMI
 Adult W – less lean/underweight (1)
 Adult X – obese AW (1) very overweight/maybe very muscular (1)
 Adult Y – normal range (1)
 Adult Z – normal range (1) 4 marks
- a iii) Resting pulse
 Adult W – normal range (1)
 Adult X – normal range (1)
 Adult W/X/Z similar fitness (1)
 Adult Y – above normal range (1) / least fit (1)
 Adult Z - normal range (1)
 Disqualify marks of W/Y/Z which suggest relative fitness values with comparisons
 to each other 4 marks
- a iv) Recovery time
 Adult W – with Y – least fittest (1)
 Adult X – fittest of the four AW (1)
 Adult Y – with W – similar fitness (1)
 Adult Z – second fittest of the four AW (1)
 Disqualify marks if contradictions made in any part of the answer 4 marks
- bi) Ref to BMI being weight in kilograms (1) divided by (1) height in metres squared
 (1) 3 marks
- bii) Ref to does not differentiate between fat and muscle for high values AW
 Not just body build 1 mark

Total 20 marks

4

a)	Barrier (1 mark)	May be overcome by (1)
	Costs e.g. gym fees	exercise for 'free' e.g. walk, jog, DVD
	Skill/fitness level	use beginners class/exercise with friend/at home
	Facility location	exercise at home – housework/walk locally - to transport
	Family commitments	exercise with family members
	Cultural attitudes or e.g. gender mixed exercising	separate gender gym services/at home exercise

max 3 + 3 6 marks

bi) Answers are likely to point out that regular exercise will improve or regulate Ronan's type 1 diabetes by using up energy/from carbohydrates – sugars/which reduces insulin demand/making it easier for Ronan to regulate blood sugar levels/and less need for liver/muscles/to convert glucose/to glycogen.

Ref to Ronan's hypertension being helped by regular exercise improving arterial elasticity/by stretching arterial muscle walls/which reduces resting blood pressure/both systolic/and diastolic pressures/so reducing atherosclerosis/atheroma/plaque AW/reducing blood cholesterol/helping HDL:LDL balance/improving blood flow/through less arterial resistance.

Mark Ranges

0 marks

No response worthy of credit

1-3 marks

Answers show some relevant knowledge of the impact of regular exercise on type 1 diabetes and hypertension but will be brief and lacking in detail. Effects will tend to be stated rather than explained e.g. regular exercise lowers blood sugar but no explanation of how this is achieved.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

4-6 marks

Answers give a reasonably coherent account explaining in some detail how regular exercise might improve or regulate type 1 diabetes and hypertension e.g. blood sugar levels reduced as glucose used to supply energy. There is some relevant technical terminology.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

7-9 marks

Answers are coherent and well-structured explaining in good physiological detail how type 1 diabetes and hypertension might be improved or regulated e.g. blood sugar levels reduced as exercise increases energy demand so cellular respiratory rate in muscle tissue increases metabolism of glucose. Relevant technical terminology is correctly used.

Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band.

9 marks

- bii) Ref to Ronan needing medical check/expert advice to determine safety (1) a very gentle/ low intensity exercise to begin (1) with small progression steps AW increasing demand (1) suitable suggestions – low impact – walking/swimming/cycling (1) with monitoring of progress/demand AW (1) Allow ref to minimum high intensity work (1) concentrating instead on endurance (1) rhythmic AW activity (1)

max 5 5 marks

Total 20 marks

Paper total 80 marks