ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Health & Social Care 8621/8623/8626/8629

HC13 The Role of Exercise in Maintaining Health and Well-being

Mark Scheme

2007 examination - January series

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.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

The Role of Exercise in Maintaining Health and Well-being HC13

Question 1

ai) VO_2 max 1 mark

aii) Good aerobic fitness is – the body can take in O_2 (1) transport it to cells and tissues (1) utilise it/respire with it (1) efficiently/with ease AW (1) to sustain work for long periods/endurance high AW (1) ref to working beyond 12 mins (1) max 4 4 marks

aiii) Ref to Ali's body will have – increased surface area of the lungs/lung capacity (1) increasing O_2 diffusion into the blood (1) his blood's O_2 carrying capacity will have increased (1) heart working capacity/cardiac output/stroke volume AW will have increased (1) pulse rate lower/heart less stressed (1) arterial wall elasticity will have increased (1) withstanding greater blood pressure fluctuations (1) number of capillaries in lungs increased (1) capillaries in skeletal muscles increased (1) muscles increase in size (1) more effective respiration/metabolism/use of O_2/VO_2 max inc (1) develop endurance (1) max 9 9 marks

b) 1. Dynamic strength – ref to power/exerting force (1) ability of neuro-muscular system (1) to overcome resistance (1) with high speed contraction (muscle) (1) e.g. when sprinting/throwing/weightlifting/jumping (1) max 3 3 marks

2. Flexibility – amount of stretch AW (1) allowed by ligaments/tendons/muscles (1) allow example of movement (1) around joint/of whole body (1) without pain (1) max 3 3 marks

Question 2

ai) Any 3 of: with appropriate linked reason
Expert advice/Medical check (1) – to prevent over-exertion (1)
Warm up (1) prepare body for exercise (1) or physiological example

Allow more physiological detail in warm up/down answers if offered e.g. reducing O_2 deficit/removing oxidising lactic acid

Wear correct/appropriate clothing (1) prevent accidents/temp control/ comfort, freedom of movement/allow sweating
Correct use of monitoring equipment (1) to make appropriate progress (1)
max 3 + 3 6 marks

aii) Any 2 of: Social benefits (1) if meets/interacts with others when exercising (1) (2 marks)
Combat aging (1) through maintaining body system function e.g. delayed muscle loss (1) (2 marks)
Respiratory/cardio benefit (1) lung function/atherosclerosis (1) (2 marks)
Reduce stress (1) by 'clearing the mind' (1) concentrate/sleeping patterns/mood enhancing chemicals (1) (2 marks)
Raise self-esteem/feel good/confidence (1) as emotional effect (1) (2 marks)
max 2 + 2 4 marks

b) Ref to: Alison will suppress her appetite (1) reducing risk of overeating (1)
ref to appestat (1) in hypothalamus (1) receiving information from the blood (1)
being helped to adjust calorific intake/because of the exercise (1)
She will increase energy output (1) affecting the energy equation (1) so if
output due to exercise more than input (weight loss) (1) this is a negative balance (1)
Her exercise will use up carbohydrates/sugars/starches (1) by converting stored
glycogen (1) from liver/muscles (1) to glucose (1) for energy supply needed by the
exercising (muscles)/ respiration/metabolism AW (1)
Fat will also be used (1) as her body fat triglycerides (1) converted to free
fatty acids (1) max 10 10 marks

Question 3

ai) Ref to: Similar perception at start (1) Female D (likely) the fittest (1) because overall rise
recorded least (1) small increases/1-2 point rises each min (1)
Female B (likely) the least fit (1) greatest increase overall (1) large increase
2-3 mins/3-4 mins (1) working near maximum at 4 mins (1)
Females A/C (likely) similar fitness (1) similar increases overall/7 pts (1)
similar pattern between minutes/3-4 pts each min (1)
Allow point for currectly placing A or C between other two individuals on
fitness scale e.g. A/C less fit D/more fit than B (1) max 10 10 marks

aii) Ref to – perceived exertion scales are subjective /not objective AW (1) same numbers
can mean different degrees of effort/vice versa (1) 2 marks

b) BMI indicates that she is overweight 2 marks
Peak flow suggests asthma/respiratory problem/small person
1 mark

c) i) BMI is weight in kilograms (1) divided by (1) height in metres^2 (1) 3 marks
ii) Peak flow is obtained using a peak flow meter/spirometer (1) from a
single (1) hard exhalation (1). Allow ref speed/rate of flow (1)
exhaled air max 3 3 marks

Question 4

ai) 1. Re. diabetes – regular exercise will help Mitchell use up sugar/carbohydrate (1)
reducing blood sugar levels/prevent hyper(glycaemia) (1) reduces stress/pressure on body to
convert as much sugar to glycogen (1) in liver/muscles (1) reduces risk of
excreting sugar in urine (1) causing hypo/low levels/coma (1)
Allow mark for correct ref to less insulin required (1) max 6 6 marks

2. Re heart disease – regular exercise will help Mitchell maintain arterial
elasticity AW (1) reducing risk of plaque formation/atherosclerosis or a similar condition
AW (1) increased proportion of HDL to LDL (High density Lipoproteins to Low density
Lipoproteins (1) and overall cholesterol level reduced (1) reduces/hypertension 4 marks

b) Any 4 of: begin with light walking/short distances/gentle steady speed (1) progress
gradually (1) don't overexert (1) check with medical advice (1) ensure
safety/walk with others (1) use comfortable/appropriate shoes/clothes (1) don't get
too hot or cold (1) max 4 4 marks

c)	Any 3 of	with linked suggestions (1 each)
	Costs or e.g. equipment/clothing (1)	exercise at home/off-peak
	Skill level (1)	sessions/beginners
	Fitness level (1)	classes/walk to work/exercise
	Facility location (1)	with family/do housework
	Work/family commitments	
	Cultural barriers (1)	single sex sessions (1)
	max 3	6 marks

Paper Total 80 marks