



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

Health and Social Care

HC13

**(Specification
8621/8623/8626/8627/8629)**

**Unit 13: The Role of Exercise in Maintaining
Health and Well-Being**

Final

Mark Scheme

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Question 1

Question	Part	Sub Part	Marking Guidance	Mark	Comments
1	01		VO ₂ max measures aerobic fitness (1) in terms of the maximum capacity AW (1) to take in oxygen (1) transport it (1) and use it in cellular respiration AW (1) units ml/kg/min – millilitres of oxygen /kilograms of body weight/minute (1) max 4 without units Allow – ability to endure/sustain work for very long periods/stamina (1)	5	
1	02		Leroy's VO ₂ max measurement indicates he is aerobically fitter AW than Tom NOT Leroy is fit or Tom is not fit.	1	Not healthier
1	03		Regular exercise will increase Leroy/Tom's VO ₂ max measurement/by strengthening – increased efficiency of diaphragm – intercostals muscles/improving the ability to expand their lungs – increasing lung capacity/improving oxygen uptake/strengthening – increasing the efficiency of heart muscle/in terms of maximum rate of beat/and stroke volume – cardiac output AW/increasing development of capillary networks for muscles/increased elasticity of arteries allow reference to less risk atheroma/by repeated blood pressure changes/improving oxygen delivery to cells – tissues – muscles/increasing skeletal muscle tissue – stamina – muscle strength max 8	8	Allow resting pulse reduced
1	04		Dynamic strength (power) is the ability of a muscle(s) to contract at speed (1) while overcoming resistance (1) plus suitable example – sprinting/throwing/weight lifting/jumping (1)	3	Allow fast swimming/ cycling
1	05		Flexibility (1) contributes by allowing a wide range of movement/by whole body or a single joint/enabling good balance – freedom of movement free pain - discomfort AW/allow ref to ligaments and tendons allowing movement max 3	3	

Question 2

Question	Part	Sub Part	Marking Guidance	Mark	Comments
2	06		<p>Ref to regular exercise emotionally benefitting individuals by enhancing mood – feel good AW/by stimulating endorphins – encephalins – serotonin secretion/in the brain from nerve endings/helps also raise confidence-self-esteem/especially if lose weight – maintain ‘ideal’ weight achieve body shape they want/reduce stress max 3</p> <p>Benefits individuals socially if exercise activities involve others – provides opportunities to interact/ meet new people/with likeminded-common interest-social support approval individuals/helps develop new friendships/maintain existing friendships/develop social skills max 3</p>	6	
2	07		<p>Ref to warm-down programmes helping prevent injuries if stopping strenuous exercise suddenly/less risk of cramp-discomfort-soreness/by clearing lactic acid from muscles/reduce of oxygen debt/maintaining a higher metabolic rate/prevents dizziness/from reduced blood pressure/insufficient oxygen reaching the brain/prevents blood pooling in veins max 5</p>	5	
2	08		<p>Stretch and Challenge. Likely points will include – ageing naturally causes a loss of effectiveness in body systems/regular exercise helps delay – slows the rate of decline – maintains body system effectiveness/this may be different for different individuals/for the respiratory system/lung capacity will decrease/musculo-skeletal system/loss of strength/loss of stamina – endurance/speed of movement/flexibility/bone density reduced/for circulatory systems cardiac output AW reduced/blood pressure rises/blood cholesterol/regular exercise helps maintain lung capacity AW/reduces protein depletion in muscles/maintains flexibility strength and elasticity of muscles and ligaments/maintains bone density through calcium</p>	9	

			<p>deposition/lowers chance of osteoporosis/resting blood pressure reduced/reducing risk of clotting thrombosis AW/level of blood cholesterol reduced/reduces atherosclerosis-atheroma-plaque AW/helps maintain metabolic rate/energy levels of the individual.</p> <p>Mark Ranges</p> <p>0 No response worthy of credit</p> <p>1-3 marks Generally vague and repetitive answers covering 1-3 points with little, if any, physiological detail. There will be little use of appropriate terminology. Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band. Conversely, those who display some confusion and weakness in QWC supporting knowledge and understanding should be placed at the bottom end of the mark band.</p> <p>4-6 marks More detailed responses covering 4-6 points in some physiological detail. There will be some use of appropriate terminology and answers will be organised but lack some precision. Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band. Conversely, those who display some confusion and weakness in QWC supporting knowledge and understanding should be placed at the bottom end of the mark band.</p> <p>7-9 marks Answers cover 7 or more points in good physiological detail and are well structured. There will be good use of appropriate technical terminology. Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band. Conversely, those who display some confusion and weakness in QWC supporting knowledge and understanding should be placed at the bottom end of the mark band.</p>		
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Question 3

Question	Part	Sub Part	Marking Guidance	Mark	Comments
3	09		Female X normal range/ Female Z normal range/ Female Y normal range. Allow Female X and Z similar fitness levels. Female Y less fit/unfit max 3	3	Must refer to all three females for full marks.
3	10		Female Z has smallest rise in pulse rate/suggests she's fittest. Female Y has largest rise in pulse rate/suggests she's least fit. Female X rise more than Z – less than Y/suggests less fit than Z – fitter than Y. Female Z shortest recovery time/suggests she's fittest. Females X and Y same recovery time – equal fitness level	5	
3	11		Female X in normal range (1) Female Y in obese category AW (1) Female Z in normal range (1)		Allow comparisons – Female X/Z likely to be fitter than Y/ Y least fit and Females X and Z likely to be similar fitness.
3	12		Ref to individual sits calmly/still – relaxed/pulse taken at wrist side of groin-neck/using fingers/not thumb – as has its own pulse/pressing to feel arterial expansion – contraction/counting beats/for 20 sec – 30 sec/x3 – x2 to get beats per minute/60 secs max 6 marks After exercise pulse retaken every minute AW until resting rate achieved 1 mark	7	
3	13		Strength – standardised data available/reliable measure (1) Limitation – may be affected by other factors – anxiety/caffeine (1)	2	

Question 4

Question	Part	Sub Part	Marking Guidance	Mark	Comments
4	14		Rick can exercise at home/walk/jog/do housework/use exercise CD – DVD Allow cycling.	2	Not transport to gym.
4	15		Any two of: skill – fitness level/costs/work – family commitments	2	Allow culture.
4	16		Likely points will include Rick needing low intensity activity initially AW/following medical check – advice/gradually increasing activities/repetitious –allow examples – walking/swimming/cycling/dancing progressing to jogging – running/monitoring progress carefully/avoiding over exertion/aiming at rhythmic AW activity max 6	6	Allow appropriate equipment as alternatives to activities. Marks e.g. exercise bikes, treadmills, cross trainers.
4	17		<p>Stretch and Challenge. Likely named major diseases or disorders will be: heart diseases/cerebral infarction – stroke AW/type 2 diabetes – allow just diabetes but not type 1 /diseases linked with obesity Heart diseases prevented by reducing risk of atherosclerosis/less plaque deposits/by maintaining good circulation/arterial diameters – lumen kept wide/walls elastic/blood cholesterol lowered/improves HDL:LDL ratio/less risk of embolism – blockage/myocardial infarction - cerebral infarction prevented by less risk of thrombus/blocking blood supply to the brain/or weakened arterial walls/aneurism AW bursting/as blood pressure lowered – type 2 diabetes prevented as exercise uses glucose/reduces need for insulin/body cells less likely to become resistant to insulin/as blood sugar levels reduced/helps prevent obesity/factor in type 2 diabetes – obesity related diseases – disorders – gallstones less likely to form/as cholesterol reduced/less chance of joint damage/as weight reduced – maintained/less risk of hernia/muscle tone – strength maintained.</p> <p>Mark Ranges 0 No response worthy of credit</p>	10	

			<p>1-3 marks Only 1-3 points made with little physiological reasoning. Answers generally vague and repetitive with little use of appropriate terminology. Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band. Conversely, those who display some confusion and weakness in QWC supporting knowledge and understanding should be placed at the bottom end of the mark band.</p> <p>4-7 marks More detailed responses covering 4 or more points in some physiological detail. Answers will be organised but lack precision and there will be some use of appropriate terminology. Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band. Conversely, those who display some confusion and weakness in QWC supporting knowledge and understanding should be placed at the bottom end of the mark band.</p> <p>8-10 marks Answers are well structured and cover 8 or more points in good physiological detail. There will be good use of appropriate terminology. Candidates who deploy appropriate knowledge and understanding and display higher QWC skills should be rewarded at the top of the mark band. Conversely, those who display some confusion and weakness in QWC supporting knowledge and understanding should be placed at the bottom end of the mark band.</p>		
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