Question Number	Answer	Additional Guidance	Mark
1(a)		**NB any sign of an arrow then item to go to review.**	
	1. platelets ;	1. **ACCEPT** plattelets, platellets	
	2. prothrombin ;	2. **ACCEPT** prothrombrin	
	3. fibrin ;		**(3)**

Question Number	Answer	Additional Guidance	Mark
1(b)	1. prevents oxygen reaching the heart {muscle / cells / tissue / eq} ;	1. **ACCEPT** heart muscle ischaemic	
	2. prevents (aerobic) respiration ;	2. **ACCEPT** reference to anaerobic respiration / lactic acid production **ACCEPT** { no / less } ATP is produced	
	3. (cardiac) muscle { unable to contract / dies / eq } ;	3. **ACCEPT** produces interference in the electrical impulses across the heart / eq **ACCEPT** cells of the heart die	**(3)**

Question Number	Answer	Additional Guidance	Mark
1(c)(i)	1. description of the trend e.g. increasing ratio decreases death rate, negative correlation / eq ;		
	2. highest death rate in countries with lowest ratio of unsaturated to saturated fatty acids / eq ;	2. **ACC T** converse	
	3. correct manipulation of figures to illustrate relationship ;	**3**. e. g. Finland and Italy 2x ratio / deaths down by 268 Finland and USA ratio up by 0.1 / deaths down by 95	**(3)**

Question Number	Answer	Additional Guidance	Mark

1(c)(ii)	1. increase the ratio of unsaturated to saturated in their diet / eq ;
	
	2. because in countries with a low ratio of unsaturated to saturated the death rate by CVD is high / eq ;
	
	3. replace animal fats with plant oils / reduce animal fats / increase plant oils ;
	
	4. because { animal fats / beef / butter } have a high % of { saturated fatty / palmitic / stearic } acids /
	  OR
	  { plant oils / olive and corn oil } have a high % of {unsaturated fatty / linoleic / oleic } acids
	  OR
	  { saturated fatty / palmitic / stearic } acids raise blood cholesterol /
	  OR
	  { unsaturated fatty / linoleic / oleic } acids {reduce / do not raise } blood cholesterol (to reduce chance of death) ;
		1.ACCEPT eat more unsaturated and less saturated
		
		3. **ACCEPT** suitable reference to beef, butter, olive oil and corn oil
			(3)

Question Number	Answer	Additional Guidance	Mark
1(d)	1. other { variables / uncontrolled variables / eq } affect CVD ; 2. genetic differences (between national populations) / eq ; 3. (countries have) {environmental / life style } differences / eq ; 4. idea that data does not provide a causal { link / mechanism} ;	 2. **ACCEPT** gender 3. **ACCEPT** differences in levels of activity, smoking, other dietary factors e.g. salt, alcohol consumption **ACCEPT** age profiles of countries may differ	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(a)	1. idea that stimulation generated from within (muscle) ; 2. idea that this results in depolarisation ;		**(2)**

Question Number	Answer	Additional Guidance	Mark
2(b)	1. idea that it shows electrical activity of the heart ; 2. idea of how to identify {one heart beat / time for one heart beat} ; 3. count the number of { these / peaks / eq } in a {set time / stated time} or how long from one set of electrical activity to the next ; 4. description of how to obtain heart rate e.g. beats divided by time ;	**ACCEPT for 2:** from one {P wave / QRS complex / T wave } to the next	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(c)	**QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence** 1. the concentration of carbon dioxide in the *alveoli* is higher / eq ; 2. the concentration of carbon dioxide in the blood is higher / pH of blood is lower / eq ; 3. detected by *chemoreceptors* in {*medulla* /*carotid* artery / *aorta* }; 4. reference to {*cardiovascular / cardiac*} control centre in *medulla* ; 5. reference to *autonomic* nervous system / *sympathetic* nerve ; 6. more impulses to *SAN* / eq ; 7. { *noradrenalin(e) / norepinephrine* } released onto *SAN* ; 8. *SAN* (excitation) rate increased / eq ; 9. heart rate will increase / eq ;	**QWC Emphasis is on spelling of technical terms** **1 ACCEPT** {diffusion / concentration} gradient increased	**(5)**

Question Number	Answer	Mark
3(a)(i)	31.0 / 31.02 / 31 ;	**(1)**

Question Number	Answer	Additional Guidance	Mark
3 (a) (ii)	Obese class I / moderately obese ;	ACCEPT category based on answer to (ai)	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(a) (iii)	(QWC – **Spelling of technical terms must be correct** and the answer must be organised in a logical sequence) 1. idea of damage to {*endothelium / endothelial lining*} of {*artery / arteries*} ; 2. reference to *inflammatory* response ; 3. leading to formation of {*atheroma / plaque / atherosclerosis* } ; 4. increased risk of blood clot formation / eq ; 5. ref to {loss of elasticity of *artery* / narrowing of *lumen* / eq } ; 6. idea of (*positive feedback* causing) further increase in blood pressure ;	QWC emphasis is spelling [penalise once only] 1. ACCEPT lining of *artery* IGNORE wall NOT vein 2. ACCEPT detail e.g. foam cells, white cells move into wall , macrophages etc 4. CCEPT *thrombus* 5. CCEPT hardening of *artery* wall, blocking of artery	**(4)**

Question Number	Answer	Additional Guidance	Mark
3 (b)	Explanations should be linked to the medical advice. 1. reduce energy intake / increase activity / follow calorie controlled diet / eq ; 2. idea of change in balance of energy budget ; 3. lower {weight / BMI / obesity level / eq} / reduce risk of {atherosclerosis / diabetes / eq} ; OR 4. statins / sterols / reduce { cholesterol / saturated fats / eq} in diet / eq ; 5. reduce blood cholesterol levels ; 6. idea of reducing risk of atherosclerosis / eq ; OR 7. eat more fruit / vegetable / vitamins / moderate alcohol intake / eq ; 8. reference to antioxidants ; 9. they protect against free radical damage / reduce damage to cells / eq ; OR 10. anticoagulants / platelet inhibitory drugs / warfarin / aspirin / eq ; 11. prevent blood clot formation / eq ; 12. reduces risk of blocking artery / eq ;	NB: if more than one piece of medical advice given, mark the one which has the best explanation IGNORE smoking, salt intake 1. **NOT** just healthier diet ACCEPT regular exercise / lower {fat / carbohydrate } intake 2. **ACCEPT** lowers LDL / HDL ratio 3. and 6. **ACCEPT** reduces chance of atheroma / blood clot / eq 4. **ACCEPT** improve HDL/LDL ratio **IGNORE** increase HDL (unless instead of LDL) 10. **DO NOT ACCEPT** drugs to treat blood pressure e.g. beta blockers	(3)

Question Number	Answer	Additional Guidance	Mark
3 (c)	1. idea that death rates decrease over time for three of the countries ; and any two from 2. death rate for Poland has{ increased / eq} (overall) ; 3. limitations of the data due to number of countries / eq ; 4. limitations due to timescale of data / eq ; 5. limitations due to men only data / eq ;	1. **ACCEPT** all except Poland / eq **IGNORE** separate descriptions of data for Finland, UK and Italy 2. **IGNORE** decreased after 1990	(3)

Question Number	Answer	Mark
4(a) (i)	ACCEPT answers between 0.14 and 0.15 inclusive ;	**(1)**

Question Number	Answer	Mark
4(a) (ii)	ACCEPT answers between 13.4 and 13.6 inclusive ;	**(1)**

Question Number	Answer	Additional Guidance	Mark
4(b)	1. pressure increases from 0 to 3.3 during {atrial systole / ventricular diastole / from 0 to 0.14s / eq} ; 2. pressure increases to {14.5 / 14.4} {during ventricular systole / from 0.14s / eq}; 3. pressure decreases to 0 (during diastole) / eq ;	IGNORE units 1. ACCEPT between 3 and 3.5, to 0.12 to 0.14s 2. ACCEPT calculated increase e.g. 11.2 (range 11 to 11.5), from 0.12s 3. ACCEPT calculated decrease e.g. 14.5 (range 14 to 14.5)	**(3)**

Question Number	Answer	Additional Guidance	Mark
4 (c)	(QWC – Spelling of technical terms must be correct and the answer must be organised in a logical sequence)	QWC emphasis on clarity of expression Marking points are for comparing what is happening in L.A. and L.V. and giving reasons for these. NOT just a description of the cardiac cycle ACCEPT converse in each statement	
	1. {pressure changes / maximum pressures} are smaller in the atrium than the ventricle / eq ;	1. ACCEPT higher pressure in V than A in context of pumping distance ACCEPT piecing together for MPs 1, 2, 3	
	2. the atrium has less (cardiac) muscle than the ventricle ;		
	3. the atrium does not have to push the blood as far as the ventricle has to / eq ;		
	4. the increase in pressure happens in the atrium before the ventricle / eq ;		
	5. idea that atrial systole has to happen before ventricular systole in order for the ventricle to fill with blood ;	5. ACCEPT delay at AVN / eq	
	6. idea that increase in atrial pressure causes increase in {pressure / volume} in ventricles ;		
	7. appropriate reference to effect of atrioventricular valve (AV) (on pressure) ;	7. E.g. when pressure in the atrium exceeds pressure in the ventricle the AV valve opens preventing further significant rise in the pressure in the atrium	
	8. credit correct comparative manipulation of figures to illustrate a marking point ;	8. .g. compare maximum pressures exerted	**(5)**