Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2019

Life and Health Sciences

Assessment Unit AS 2
assessing
Human Body Systems

[SZ021]

WEDNESDAY 15 MAY, AFTERNOON

MARK SCHEME

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

				AVAILABLE MARKS
1	(a)	(i)	542/2000 [1] [542/2000] × 100 = 27.1/27% [1] Correct answer [2] [2]	
		(ii)	Any **two** from: • More sugar (5 vs 3g); • Too much fat (30 vs 8g); • Too much sat fat (6 vs 3g); • Too much salt (3 vs 2g). • Higher energy/calorie intake (542 vs 357) [2]	
		(iii)	Higher in sugar/5 vs 3g [1]	
		(iv)	Leads to tooth decay/diabetes/obesity [1] [1]	
	(b)	(i)	Any **three** from: • Banana more likely to lead to a feeling of fullness (helping in weight control); • Energy (kcal) content of chocolate is significantly higher than in the banana/or converse/468 v 81; • Banana contains vitamin B/converse/high levels; • Banana contains vitamin C/converse/high levels. • Sugar is lower (18 vs 25)/converse • The sugar in banana (fructose) is natural/converse [3]	
		(ii)	• Break down/(and) release energy from food • Keep the nervous system healthy • Keep skin and eyes healthy • Form haemoglobin • Form healthy red blood cells • Reduce the risk of central neural tube defects, such as spina bifida, in unborn babies • Or any other appropriate response [1]	
		(iii)	• (Maintaining) healthy skin/blood vessels/bones and cartilage • Helping with wound healing • Healthy gums • Prevents scurvy • Absorption of iron • Or any other appropriate response [1]	11
2	(a)	(i)	Body (maintaining) a steady state/set point/constant internal environment. [1]	
		(ii)	Any **three** from: • Affect blood pressure. • Affect the amount of water in the blood/water balance/controls water movement. • Affect the pH of the blood/keep blood pH constant/buffer blood. • Nerve impulse • Hydrochloric acid in stomach • Electrical balance/muscle contraction [3]	
	(b)	(i)	Hormone/steroid hormone. [1]	
		(ii)	Aldosterone (production) is reduced/stopped. [1] **Negative** feedback. [1] [2]	

					AVAILABLE MARKS
		(iii)	Any **two** from: • Drink too much water/more than 2 litres per day. • Eat too little salt/restrict salt intake/no salt. • Sodium is not absorbed due to kidney disease	[2]	
	(c)		Any **three** from: • (Increased) cardiovascular disease/CHD/heart disease/heart attack; • Hypertension/high blood pressure; • (Increased risk of) stroke; • (Increased risk of) kidney damage; • Increased risk of dehydration.	[3]	12
3	(a)	(i)	Day 1 D: 2 egg salmon omelette/2 eggs + salmon = 6.0 μg D: Liver and mushrooms = 6.0 μg D: Mushroom 2 egg omelette/mushrooms + 2 eggs = 6.0 μg D: Liver and salmon = 6.0 μg	[1]	
		(ii)	Day 2 breakfast B: Cereal and milk = 4.0 μg [1] Any **one** appropriate combination D: 2 egg salmon omelette/2 eggs + salmon = 6.0 μg/ D: Liver and mushrooms = 6.0 μg/ D: Mushroom 2 egg omelette/mushrooms + 2 eggs = 6.0 μg [1] D: Liver and salmon = 6.0 μg	[2]	
	(b)		Any **two** from: • (Overuse of) sunblock/clothing blocking sunlight exposure; • Not enough vitamin D producing/strong sunlight/poor weather; • Too much time spent indoors/too much screentime; • Avoidance/dislike of vitamin D containing foods.	[2]	
	(c)	(i)	Important to help baby grow strong **bones**.	[1]	
		(ii)	• Should consider getting vitamin D from (fortified) food; • Should consider taking a daily vitamin D supplement (containing 10 μg of vitamin D); • Sun holiday/move to sunnier country/increase sun exposure.	[2]	8
4	(a)	(i)	60–100 beats per minute.	[1]	
		(ii)	Thick(er) muscle/thick(er) walls/more muscle.	[1]	
	(b)	(i)	1 beat = 1.0 – 0.1 = 0.9 s [1] 60/0.9 = 66.7 beats per minute/67 beats per minute [1] Correct answer [2]	[2]	
		(ii)	Max volume – min vol = 118 – 50 = 68 cm^3. correct answer [1]	[1]	
	(c)	(i)	Smooth muscle/lumen/middle layer.	[1]	
		(ii)	• Larger lumen/volume/blood flow (of blood vessels) lumen widens; • Less friction/resistance (in blood vessels)/more blood can pass through the vessel.	[2]	8

AVAILABLE MARKS

5 **(a)** Spread units evenly over **3 days** or more. [1]

(b) Appropriate scaling of y-axis starting at (0). [1]
Axes labelled appropriately including correct units. [1]
bars plotted correctly for 14 units/age group. [2]
bars plotted correctly for more than 14 units/age group. [2]

Allow maximum of one incorrect bar plotted per units/week. [6]

(c) (26 + 17) = 43% [1] ecf
100 – (26 + 17) = 57%.
100 – 43 = 57% [1] [2]

(d) **Indicative content:**

- Young adults and adults and middle-aged comparable percentage consuming 14 units (26 and 28 and 24);
- In **all** age groups (**all** named) a greater percentage are consuming '14 unit' than 'more than 14 units' (26 v 17 and 28 v 11 and 24 v 8 and 9 v 2);
- In **named** age group a greater percentage are consuming '14 unit' than 'more than 14 units' (26 v 17 or 28 v 11 or 24 v 8 or 9 v 2). Maximum 1 mark for 1 named age group;
- Adults – **highest** percentage consuming 14 units (28%);
- Young adults – **highest** percentage consuming more than 14 units (17%);
- Elderly – **lowest** percentage consuming more than 14 units (2%);
- With increasing age lower percentage of each group consuming more than 14 units per week (17 and 11 and 8 and 2%);
- Percentage **not** consuming in **named** age group (YA 57% or A 61% or MA 68% or E 89%) – Maximum 1 mark for 1 **named** age group;
- Percentage **not** consuming **comparison** between (2–4) groups; Maximum 1 mark for 1 comparison;
- In **named** age group, % not consuming **+** % 14 units = percentage (YA 83% or A 89% or MA 92% or E 98%). Maximum 1 mark for 1 **named** age group;
- Elderly – **lowest** percentage consuming up to 14 units (9%);
- Percentage consuming either 14 or more comparison between (2–4) groups; Maximum 1 mark for 1 comparison;

Level of Response	Marking Criteria	Marks
Excellent	Candidates give 5 or more points from the indicative content. Presentation, spelling, punctuation and grammar are excellent.	[5]–[6]
Good	Candidates give 3–4 points from the indicative content. Presentation, spelling, punctuation and grammar are sufficiently competent to make the meaning clear.	[3]–[4]
Basic	Candidates give 1–2 points from the indicative content. There may be some errors in spelling, punctuation and grammar.	[1]–[2]
	Response is not worthy of credit.	[0]

[6]

15

			AVAILABLE MARKS
6	(a)	Any **four** from: • Meter set to zero; • Meter held horizontally; • Deep(est) inhalation/deep breath; • Quickly/forcefully) exhale through the peak flow meter/blow hard; • (Highest) of (three) **repeat** readings taken; • Maximum amount exhaled/breathed out. [4]	
	(b) (i)	$\frac{340}{450} \times 100 = 75.5\%$ [1] ecf 100 – 75.5 = 24.5% [1] [2]	
	(ii)	Not ethical to fail to treat/or equivalent/to treat asthma during the trial/all were asthmatic/to prevent asthma attack [1]	
	(c)	Any **four** from: • Both increased to normal levels (450/L min^{-1})/both were effective; • Drug A increased to normal level sooner – by week 8 (vs week 12 for drug B); • At week 12 drug A increased PEFR to higher than drug B 465 L min^{-1} drug A vs 450 L min^{-1} drug B; • Group 1 was increased to better than normal levels; • Group 1 PEFR increased from 340 to 465 L min^{-1} (125 L min^{-1}); • Group 2 PEFR increased from 342 to 450 L min^{-1} (108 L min^{-1}) • Similar baseline at week 0/both approximately 340 • Drug A is more effective/converse [4]	11
7	(a) (i)	Any **two** from: • Electron transport chain • Krebs cycle/TCA/citric acid cycle • Link reaction [2]	
	(ii)	Glycolysis can continue and energy can still be released/ATP formed, even though oxygen is in short supply/respiration can continue when oxygen is low/allows **strenuous** activity or exercise to occur for longer. [1]	
	(b) (i)	Not enough oxygen present/anaerobic respiration/strenuous exercise. [1]	
	(ii)	Two correct points from graph (x – y) [1] 0.44 – 0.1 = 0.34 Correct subtraction: After – before [1] = z (0.45 – 0.1 = 0.35) Accept 0.34 as 2 marks. [2]	
	(iii)	• Anaerobic respiration delayed/aerobic respiration lasts longer; • Aerobic respiration provides more energy (for higher intensity of exercise). [2]	
	(iv)	Any **two** from: • Increased lung capacity (or other appropriate)/lungs(muscle) are stronger/increased tidal volume • People who undertake vigorous exercise regularly take in more oxygen (at higher intensities of exercise) • Increased breathing rate [2]	10
		Total	**75**