AQA

A-LEVEL

Biology and Human Biology

BI/HB/3X

Mark scheme

2410/2405

June 2016

Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' 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.

Further copies of this Mark Scheme are available from aqa.org.uk

BI/HBI/3X: Task 1

Question	Marking Guidance	Mark	Comments
1(a)	Measured the temperature of the water every 2 minutes/regularly;	1	Accept any given regular time interval
1(b)	Adding hot water;	1	Accept heating with the (Bunsen) burner Ignore adding cold water/removing (Bunsen) burner
2	1. Same amount (of Benedict's) to react / keeps this variable constant / it is a confounding/control variable; 2. Same (potential for) colour change / allows comparison;	2	Ignore references to fair test / 'so only independent variable affects dependent variable' / standardise procedure 2. Accept same (potential for) precipitate forming
3	**Qualitative:** Non-numerical / doesn't tell you the concentration / is a description; **Subjective:** Results depend on interpretation/judgement;	2	Ignore unqualified references to 'not quantitative' Accept 'different people see colours differently'
4(a)(i)	1. Maltose; 2. Water;	2	2. Accept H_2O
4(a)(ii)	Condensation;	1	
4(b)	(No) both (might) give the same result/colour/reaction;	1	Accept (No) (some) disaccharides don't react;
Total		**10**	

BI/HBI/3X: Task 2

Question	Marking Guidance	Mark	Comments
5	1. "Drink" in the first column; 2. Three fully descriptive column headings – <u>drink</u>, colour after Benedict's test, estimation of glucose concentration; 3. Colour correctly converted into numerical data; 4. Units given as g dm^{-3} and only used in column heading for numerical data; 5. At least two readings for each drink;	5	2. 'Colour with Benedict's' insufficient, accept colour after heating with Benedict's. If no column for colour then cannot award mp2 or mp3. 4. Allow g/dm^3 for g dm^{-3}
6	1. Graph has drink on x-axis and concentration of glucose on y-axis; 2. Y-axis labelled Glucose concentration/g dm^{-3} <u>and</u> x-axis labelled Drink; 3. Appropriate scale selected for y axis; 4. Bars plotted accurately; 5. Bars drawn equal width and not touching;	5	2. Allow ECF from table 2. Allow g/dm^3 for g dm^{-3} 5. Accept a single line for a bar 5. Bars should be equally spaced
Total		**10**	

BI/HBI/3X: Written Test

Section A

Question	Marking Guidance	Mark	Comments
7	Colour (of juice) makes it difficult to see result;	1	
8(a)	1. Use more (intermediate) concentrations; 2. More colours for comparison/interpretation;	2 max	1. Reject references to extending the range of concentrations Mark as pairs of statements. Accept: 1. Use a colorimeter; Reject calorimeter 2. Use a calibration curve; Accept: 1. measure mass of precipitate; 2. Use a calibration curve;
8(b)	No (no mark) 1. Likely to give same colour; 2. Unlikely to change (estimated) concentration much; OR Yes (no mark) 1. (More glucose present so) colour may be more yellow/brown/orange/red; 2. Could give higher concentration estimate;	2	Mark as pairs
9(a)	1.1 (g);	1	
9(b)	300(%);	1	

10(a)	1. Add iodine/potassium iodide solution; 2. Blue-black colour (with starch);	2	1. Reject if heated 2. Accept black 2. Ignore purple
10(b)	1. Hydrolysed by enzymes / hydrolysed by amylase/maltase; 2. Produces glucose (in the gut); 3. Small enough to cross the gut wall (into the blood) / monomers/monosaccharides (can) cross the gut wall (into the blood);	3	1. If named enzyme given, it must relate to the correct substrate 3. Accept cell membranes/epithelium/cells for 'gut wall'
10(c)	1. Time how long it takes to go brick red; 2. Weigh precipitate; 3. Dilute glucose samples / use smaller volume of glucose samples / use greater volume of Benedict's reagent;	1 max	Ignore references to colorimeter
11	1. Specific (to glucose); 2. Reference to the practicality of doing Benedict's at home; 3. Idea of colour of blood masking the colour change (with Benedict's); 4. More sensitive / (may) provide more accurate information (on concentration);	2 max	
TOTAL		**15**	

BI/HBI/3X: Written Test

Section B

Question	Marking Guidance	Mark	Comments
12	Easy to take a blood sample/more complicated/dangerous to take brain cell sample;	1	Accept 'No uptake into brain cells'
13	1. Reading scientific books/journals; 2. Asking other scientists; 3. From earlier investigations;	1 max	
14	(GLUT1 deficiency) is rare;	1	
15	1. Not all with reduced uptake had the mutation OR some/one who had the mutation had normal uptake; 2. Reduced glucose uptake could be due to another disease/condition; 3. Only one study done/more investigations needed;	1 max	1. Accept some had reduced uptake but no mutation.
16(a)	1. Antibodies/lysosomal enzymes are proteins; 2. Fewer phagocytes/B cells/T cells/lymphocytes/plasma cells/memory cells/antibodies/lysosomes;	2	
16(b)	1. High fat intake (likely to) increase <u>blood</u> cholesterol; 2. (Raised cholesterol) linked to atherosclerosis/CVD/CHD/atheroma; 3. (Increased risk of/can lead to) myocardial infarction;	3	2. Accept (raised cholesterol) linked to blockage of coronary artery or to thrombosis 2. Ignore unqualified reference to heart disease

Question	Marking Guidance	Mark	Comments
17(a)	1. Other treatments were working better; 2. Found it difficult to follow the diet/did not like the diet; 3. Saw no improvement; 4. They died / relocated; 5. They developed high blood cholesterol;	2 max	
17(b)	1. (Yes) many of the children had fewer than 50%/90% of the original number of seizures per day after the diet; 2. (No) some children were still having over 90% of the original number of seizures per day after the diet; 3. (No) the number/percentage of children having over 90% of the original number of seizures per day increases after three years compared to one year; 4. (No) only 58.7/59% of the children were still following the diet after one year / only 55.3/55% of the children were still following the diet after three years; 5. Information about seizures per day is only given for two time points/study stops after three years / information only in 3 seizure percentage categories;	3 max	3. Accept (No) the number/percentage of children having under 50%/having 50-90% decreases from one year to three years; 5. Accept idea that we do not know if children now had no seizures or if some children now had more seizures than original;
18	1. They were having fewer seizures; 2. If they went off the diet, they might have a higher rate of seizures; 3. Might improve over the next year/might take more than a year to show the full effect; 4. Other treatment options might have even less effect;	1 max	
TOTAL		**15**	