Pearson Edexcel

Mark Scheme (Results)

January 2019

Pearson Edexcel International GCSE

In Human Biology (4HB0) Paper 2

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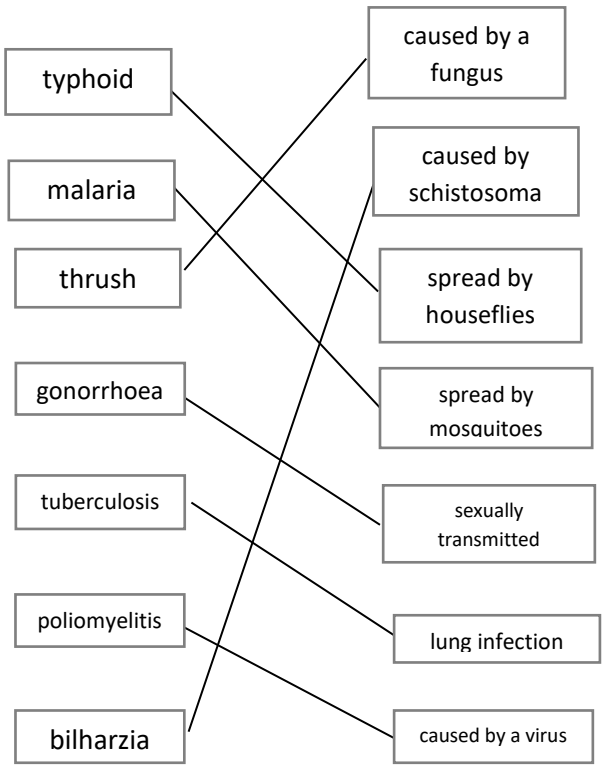
General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question number	Answer	Notes	Marks
1		All correct = 6 marks 5 or 6 correct = 5 marks	6 Total 6 marks

Question number	Answer	Notes	Marks
2 (a) (i)	• otherwise would see food/ identify food by sight/would not need to taste or smell food/to ensure food is identified by taste/smell only;		1
(ii)	• 160; • 200; • 80%;	Full marks for correct final answer	3
(iii)	THREE OF • more people correctly identified food when nostrils not closed/when only eyes covered/ easier to identify food when nostrils not covered; • smell increases ability to identify food; • taste increases ability to identify food: • variations/differences between people; • reference to guesswork; • anomalous result for Person 3	Accept description of differences	max 3
(iv)	• size/volume/mass/type of food; • time left on tongue/same area of tongue; • same people/age/gender;		3
(b)	TWO OF • reduce/eliminate effect of anomalous result/to identify anomalies; • to compare results; • calculate mean; • more reliable;		max 2
(c)	touch/texture/sight;	ACCEPT description that implies sense or valid alternative	1
			Total 13 marks

Question number	Answer	Notes	Marks
3 (a) (i)	• deamination; • (excess) amino acids; • in liver;	Allow 1 mark for breakdown of amino acids for marking points 1 AND 2	3
(ii)	• not very toxic/medium toxicity; • highly soluble; • little water needed to remove it/enables water to be conserved; • not much energy/only 4ATP required to remove each molecule/little energy used;		4
(iii)	• urine is a solution/fluid/urea is a solid; • urine is a mixture/urea not a mixture; • (urine) contains dissolved salts/urea; • urea is an excretory substance/nitrogen containing molecule;		3
(b) (i)	plasma;		1
(ii)	• kidneys keep urea concentration constant/at 100 au/remove urea from the blood; • concentration keeps on rising when kidneys not working;		2
(c)	• dialysis; • transplant;		2
			Total 15 marks

Question number	Answer	Notes	Marks
4	8 of • diffusion • movement from high to low concentration/down a concentration gradient; • osmosis; • movement of water molecules; • from high to low water potential/from a dilute to solution to a (more) concentrated solution; • through selectively permeable membrane; (Factors affecting diffusion/osmosis): • surface area; • temperature; • distance to travel; • ref to steepness of gradient; • active transport/uptake; • uses energy/ATP; • against a concentration gradient;	Ignore references to concentrations of water ALLOW once with ref to diffusion/osmosis MP's 7-10 allow once with ref to either diffusion or osmosis	8 Total 8 marks

<table>
<tr><th>Question number</th><th>Answer</th><th>Notes</th><th>Marks</th></tr>
<tr><td>5 (a) (i)

(ii)</td><td><table><tr><th>Function</th><th>Letter of chamber</th></tr><tr><td>receives oxygenated blood</td><td>Y;</td></tr><tr><td>sends blood to lungs</td><td>W;</td></tr><tr><td>receives deoxygenated blood</td><td>X;</td></tr><tr><td>sends blood to body</td><td>Z;</td></tr></table>
• prevents backflow of blood;
• from left ventricle to left atrium;</td><td>

Accept from Z to Y</td><td>4

2</td></tr>
<tr><td>(b)</td><td>FOUR OF
• blood can pass between ventricles/oxygenated and deoxygenated blood mix;
• blood doesn't travel to lungs/body effectively;
• poor oxygenation/less oxygen in blood/to body cells;
• less aerobic respiration/less energy/less growth;
• reference to anaerobic respiration/build-up of lactic acid;
• reference to drop in blood pressure/increase in heart rate;</td><td></td><td>Max 4

Total 10 marks</td></tr>
</table>

Question number	Answer	Notes	Marks
6 (a)	temperature;		1
(b)	• maximum rate of activity between 60-70 ° /optimum temperature for this enzyme is between 60-70 °C ; • optimum temperature for human enzymes 37-40°C; • this enzyme would be less active/inactive at body temperature/37-40 °C; • human enzymes denature/breakdown above optimum/over 40 °C;		4
(c)	• enzyme denatures; • shape of active site lost/disrupted; • no enzyme-substrate complexes formed/no binding of substrate possible;	Reject dies	3 Total 8 marks