



Mark Scheme (Post Revision)

SAM

Pearson Edexcel International GCSE
in Human Biology (4HB1)
Paper 01

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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	<table><tr><th>Description</th><th>Substance</th></tr><tr><td>involved in blood clotting</td><td>fibrinogen;</td></tr><tr><td>protects developing fetus</td><td>amniotic fluid;</td></tr><tr><td>is a storage form of glucose</td><td>glycogen;</td></tr><tr><td>controls the metabolic rate of the body</td><td>thyroxine;</td></tr><tr><td>causes a rise in blood glucose levels</td><td>glucagon;</td></tr><tr><td>found in red blood cells</td><td>haemoglobin;</td></tr><tr><td>level in blood rises before ovulation</td><td>oestrogen;</td></tr></table>	Description	Substance	involved in blood clotting	fibrinogen;	protects developing fetus	amniotic fluid;	is a storage form of glucose	glycogen;	controls the metabolic rate of the body	thyroxine;	causes a rise in blood glucose levels	glucagon;	found in red blood cells	haemoglobin;	level in blood rises before ovulation	oestrogen;	<p>only accept correct spelling for glycogen</p> <p>only accept correct spelling for glucagon</p>	<p>7</p> <p>Total 7 Marks</p>
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Question number	Answer	Notes	Marks
2 (a)	<ul style="list-style-type: none"> • scales and units; (1) • correct plots; (2) • two days identified/key; (1) • X and Y axes correct way round; (1) • points joined to form lines; (1) 		6
(b)	any two of <ul style="list-style-type: none"> • both follow same pattern; (1) • increased initially; (1) • decrease after (about) 2 hours; (1) 	Allow marks for description of separate lines	2
(c)	any four of <ul style="list-style-type: none"> • hotter on day 2; (1) • so more sweat; (1) • more ADH secreted; (1) • more water reabsorbed; (1) • less passed out as urine; (1) 	accept reverse argument for day 1	4
			Total 12 Marks

Question number	Answer	Notes	Marks
3 (a)	<ul style="list-style-type: none"> • glycerol; • fatty acids; 		2
(b)	<ul style="list-style-type: none"> • crush food; • add alcohol; • add drops of water; • milky colour shows presence of lipid; 		4
(c) (i)	<ul style="list-style-type: none"> • B; (lipase) 		1
(ii)	<ul style="list-style-type: none"> • increases surface area; • because broken down into smaller droplets; • more area for lipase to act on; 		3
(iii)	<ul style="list-style-type: none"> • add equal amounts of lipid to two (test) tubes; • add equal volume of water to both; • add bile salts to one tube; • shake the two tubes; • leave to stand; • look for separation/milky appearance; 		5
			Total 15 Marks

Question number	Answer	Notes	Marks
4 (a) (i)	<ul style="list-style-type: none"> • A; (DNA) 		1
(ii)	<ul style="list-style-type: none"> • B; (mRNA) 		1
(iii)	<ul style="list-style-type: none"> • large molecule; • (cannot pass through) pore in nuclear membrane; 		2
(iv)	Any three of: <ul style="list-style-type: none"> • larger molecule; • deoxyribose vs ribose; • uracil vs thymine; • double stranded v single stranded; 		3
(b)	<ul style="list-style-type: none"> • X/DNA contains codes/genes; • transcribed /copied as RNA; • translated at Z/by ribosomes; • into protein/peptide; 		4
			Total 11 Marks

Question number	Answer	Notes	Marks
5 (a)	<ul style="list-style-type: none"> • spirometer (1) 		1
(b)			
(i)	<ul style="list-style-type: none"> • 8 in 30 seconds (1) • 16 per minute (1) 		2
(ii)	<ul style="list-style-type: none"> • $3.0 + 3.1 + 4.0$ (1) • $10.1 \div 3$ (1) • $3.3 \text{ (dm}^3\text{)}$ (1) 		3
(iii)	<ul style="list-style-type: none"> • exercise requires more energy/more respiration (1) • more oxygen required/CO_2 removed (1) • more air taken into lungs for gaseous exchange 		3
(iv)	Any three of: <ul style="list-style-type: none"> • extra oxygen needed • break down lactic acid • repay oxygen debt • remove excess CO_2 		3
(c)	<ul style="list-style-type: none"> • breathe out into limewater at rest • repeat during exercise; • one that goes cloudy quicker contains more CO_2 		3
			Total 15 Marks

Question number	Answer	Notes	Marks
6 (a) (i)	<ul style="list-style-type: none"> • spiral/like a snail shell (1) 		1
(ii)	<ul style="list-style-type: none"> • C (stapes) 		1
(iii)	<ul style="list-style-type: none"> • B (round window) 		1
(iv)	<ul style="list-style-type: none"> • transfer sound/vibrations (1) • from middle ear/incus (1) • to cochlea (1) 		3
(v)	4 of <ul style="list-style-type: none"> • three compartments (1) • membrane labelled (1) • perilymph labelled (1) • endolymph labelled (1) • sensory area labelled (1) 		4 max
(b)	<ul style="list-style-type: none"> • pressure in middle ear changes/not equal to atmospheric pressure (1) • affects movement of round window/B (1) • distorts hearing/can't hear as well (1) 		3
(c)	2 of <ul style="list-style-type: none"> • hair cell (1) • in cochlea (1) • destroyed/killed (1) 		2 max
			Total 15 Marks

