

Mark Scheme (Results)

Summer 2012

International GCSE

Human Biology (4HB0) Paper 02

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INTERNATIONAL GCSE HUMAN BIOLOGY PAPER 02 – SUMMER 2012

Question number	Answer	Notes	Marks
1 (a) (i)	A = myelin sheath; B = dendrites; C = cell body/ cytoplasm; D = node of Ranvier;		4
(ii)	motor;		1
(iii)	arrow pointing away from cell body;		1
(iv)	sensory; relay/ intermediate;		2
(b)	protective; fast; Involuntary/ automatic/ not controlled by brain;		2 max

Total 10 marks

Question number	Answer	Notes	Marks
2 (a) (i)	only small numbers of bacteria taken in; need to multiply/ reproduce; time taken for bacteria/ food to pass along gut;		2 max
(ii)	bacteria produce toxins; affect gut (lining); make it permeable to fluids/ loss of fluids from blood;		2 max
(b) (i)	hands covered in bacteria/ washing removes bacteria; can't be transferred to food;		2
(ii)	bacterial reproduction slowed; less bacteria to cause food poisoning/ enzymes/ chemical reactions slower;	Reject stopped	2
(iii)	meat can contain bacteria; if stored higher blood/ juices/ liquid could drip onto/ contaminate other food;		2

Total 10 marks

Question number	Answer	Notes	Marks
3 (a)	(i) start as a single bacterium; multiply/ divide many times/ large number produced; by mitosis/ binary fission; feed on nutrients/ agar;		2 max
	(ii) if not sterile would contain bacteria; these would affect result/ bacteria enters from outside;		2
	(iii) distribute milk evenly/ spread milk;		1
	(iv) prevents lid from coming off/ stops other bacteria entering;		1
	(v) too many colonies otherwise/ stop colonies merging/ so colonies can be counted;	must be reference to colonies.	1
(b)	(i) dish 1 = 24; dish 2 = 25; dish 4 = 26;		3
	(ii) mean figure for dish is 25; dilution is 200/ 2 x 200; 25 x 200 =5000;		3
	(iii) can't tell/ count how many colonies present; couldn't determine (original) numbers of bacteria that produce colonies;	Accept OWTTE	2

Total 15 marks

Question number	Answer	Notes	Marks
4 (a)	supplies blood/ oxygen/ nutrients to heart <u>muscle</u> ;		1
(b) (i)	cholesterol/ fat / lipid/ triglyceride;		1
(ii)	high (blood) cholesterol/ <u>saturated</u> fat levels; high blood pressure; lack of exercise; overweight; smoking; stress; hereditary factors;		2 max
(iii)	blood flow slows/ stops in vessel; less/ no oxygen/ glucose to heart muscle; heart <u>muscle</u> dies/ stops functioning; heart attack;		3 max

Total 7 marks

Question number	Answer	Notes	Marks
5 (a) (i)	no readings between pH 3.25 and 4.3; rate may go up after 3,25; so optimum would be higher;		3
(ii)	stomach; low pH/ acidic/ HCl present/ enzyme has low optimum pH;		2
(b)	denatured; as high pH breaks bonds; changes shape of active site; substrate unable to enter active site/ form enzyme-substrate complexes;		3 max

Total 8 marks

Question number	Answer	Accept	Marks
6 (a) (i)	Mother $I^A I^O$ Child $I^O I^O$ ;		1
(ii)	<p>(mother) <math>I^A I^O</math>      (father) <math>I^A I^B</math></p> <p>gametes <math>I^A I^O</math>      <math>I^A I^B</math>;</p> <p>offspring <math>I^O</math>; <math>I^A I^A</math>      <math>I^A I^B</math>      <math>I^A I^O</math>      <math>I^B</math></p> <p>blood group B; A      AB      A</p>	child is homozygous; child must inherit $I^O$ from each parent ; Father has $I^A I^B$ / has no $I^O$ ;	3
(b)	<p>(mother) <math>I^A I^O</math>      (father) <math>I^B I^O</math>;</p> <p>gametes <math>I^A I^O</math>      <math>I^B I^O</math>;</p> <p>offspring <math>I^O</math>; <math>I^A I^B</math>      <math>I^A I^O</math>      <math>I^B I^O</math>      <math>I^O</math></p> <p>blood group O; AB      A      B</p>		4
6 (c)	reference to rejection; doesn't clump/agglutinate; otherwise vessels blocked; no/less oxygen transported;		2 max

Total 10 marks

PAPER TOTAL: 60 MARKS





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