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Mark Scheme (Results)

Summer 2012

International GCSE Human Biology (4HB0) Paper 02



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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

INTERNATIONAL GCSE HUMAN BIOLOGY PAPER 02 – SUMMER 2012

Total 10 marks

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	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)					
(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 muscle;		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/HCI 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	l ^o ;			1
		(ii)	(mot I ^A)			(fai ľ ^A	ther) β	child is homozygous; child must inherit I ⁰ from each parent ; Father has I ^A I ^B / has no	3
			gametes I ^A	I ⁰		I ^A	І ^в ;	I ^o ;	
			offspring l ^o ;	I ^A I ^A	I ^A I ^B	I ^A I ^O	I ^B		
			blood group B;	A	AB	A			
	(b)		(mother) I ^A I ⁰			(father) I ^B I ^O ;			
			gametes I ^A	I ⁰		I ^B	l ⁰ ;		
			offspring l ^o ;	I ^A I ^B	I ^A I ^O	I ^B I ^O	lo		
			blood group O;	AB	А	В			4
6	(c)		reference to rejec doesn't clump/ago otherwise vessels no/less oxygen tra	glutinat blocke	ed;				2 max

Total 10 marks

PAPER TOTAL: 60 MARKS

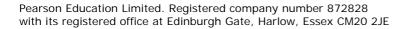
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Order Code xxxxxxx Summer 2012

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