

Mark Scheme (Results) January 2010

GCE O

GCE O Biology (7040) Paper 01

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Question Number	Answer	Mark
1 (a)	small lumen / eq.; more muscle / elastic tissue; thick outer layer;	(3)
(b)	(i) pulmonary vein; (ii) renal vein; (iii) pulmonary vein; (iv) vena cava / pulmonary artery; (v) renal vein;	(1) (1) (1) (1) (1)
(c)	one cell thick / thin / eq; permeable walls / substances pass through; I diffusion slow flow rate; network / many / surface area / eq;	Max (2)

(Total 10 marks)

Question Number	Answer	Mark
2 (a) (i)	1.06:1;	(1)
(ii)	1:1 / 50:50 / eq;	(1)
(b)	normal; all offspring have normal wings / eq;	(2)
(c) (i)	parents LI LI; gametes L I L I; genotypes of offspring LL LI LI II; phenotypes normal normal normal vestigial; NB ecf gets 3 max	(1) (1) (1) (1)
(ii)	3.54:1;	(1)
(iii)	more die / less survive / cannot fly / cannot feed / due to chance / eq;	(1)
(d)	cannot produce song / different song / eq; do not attract females / females cannot hear / eq; cannot fly;	Max (2)

(Total 12 marks)

Question Number	Answer	Mark
3	Group	Example
	(Plants)	Bean / eq;
	Animal / insect;	(Housefly)
	(Bacteria)	<i>Lactobacillus</i> / eq;
	Fungi / eq;	(Mucor)
	(Virus)	(HIV)
		4

(Total 4 marks)

Question Number	Answer	Mark
4	(a) (i) nitrification / nitrifying;	(1)
	(ii) amino acids; protein;	(2)
	(b) (i) waste / named nitrogenous waste / faeces; bacteria / decomposers / eq; less oxygen / more carbon dioxide; less food;	(3)
	(ii) less oxygen / more carbon dioxide; from photosynthesis; respiration; nitrate <u>not</u> absorbed / nitrate increases; less food;	(3)

(Total 9 marks)

Question Number	Answer	Mark	
5	a)	2 copies of each chromosome/ 2 full sets of chromosomes / 2n;	(1)
	b)	30 / 15 pairs;	(1)
	c)	cannot reproduce / cannot produce offspring / eq;	(1)
	d)	odd number of chromosomes / 61 / one extra; cannot form pairs / cannot be divided by 2 / 30.5 not possible / haploid not whole number; cannot produce gametes / sterile;	(2)
	e) (i)	roots;	(1)
	(ii)	prevent washed away / prevent erosion / damage to property / maintain habitat / eq;	(1)
	f)	less invertebrates; less birds; nowhere for invertebrates to live / habitat destruction; less food for invertebrates / less food for birds; effect on food chain / reduces species diversity / extinction / migration / eq;	Max 3

(Total 10 marks)

Question Number	Answer	Mark	
6	(a)	quick to appear / eq; rise faster / eq; more made / eq; lasts longer / eq;	Max 3
	(b)	starts at 100 /102 days; curve must mirror that of first injection;	2

(Total 5 marks)

Question Number	Answer	Mark
7 (a)	6;	1
(b)	11;; one mark for 143 cows	2
(c)	weather / drought / flood / natural disaster / eq; disease; culled by humans / age / natural death; accidents; lack of food / lack of dietary component / eq; pollution / pesticide / eq;	Max2
(d)	sheep / cow in middle; →; allow as food web	2

(Total 7 marks)

Question Number	Answer	Mark
8 (a) (i)	40;	1
(ii)	0.73 / 0.729; reject 0.72	1
(b) (i)	<u>accurate</u> / reduce error; might eat all grass / stop eating / get full / eq; lower value; less time for water loss; quicker to get results; more time for repeats;	Max2
(ii)	prevent escape; allow breathing / air in / O ₂ in / CO ₂ out / gas exchange; respiration;	Max 2
(iii)	light intensity; humidity / water / eq; species/type of grass / eq; I same grass species/type of locust; size of locust; age of locust; sex of locust; same time <u>of day</u> ; I space / wind	Max3
(c) (i)	more grass eaten at warmer temperature / eq;	1
(ii)	more active / more energy / more respiration / more metabolism / more enzyme activity;	1

(Total 11 marks)

Question Number	Answer	Mark																				
9 (a)	A nucleus; B vacuole; C cytoplasm;	3																				
(b) (i)	weak to strong solution /eq; partially permeable membrane;	2																				
(b) (ii)	long / eq; large surface area;	2																				
(c)	<table border="1"> <thead> <tr> <th>Statement</th> <th>Root hair cell</th> <th>Cell 1</th> <th>Cell 2</th> </tr> </thead> <tbody> <tr> <td>The cell with the highest concentration of solution</td> <td></td> <td></td> <td>v;</td> </tr> <tr> <td>The cell with the lowest solute concentration</td> <td>v;</td> <td></td> <td></td> </tr> <tr> <td>The cell nearest to the xylem vessels</td> <td></td> <td></td> <td>v;</td> </tr> <tr> <td>The cell with the highest availability of water</td> <td>v;</td> <td></td> <td></td> </tr> </tbody> </table>	Statement	Root hair cell	Cell 1	Cell 2	The cell with the highest concentration of solution			v;	The cell with the lowest solute concentration	v;			The cell nearest to the xylem vessels			v;	The cell with the highest availability of water	v;			4
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(Total 11 marks)

Question Number	Answer	Mark
10 (a)	smaller men have higher heart rate / converse;	1
(b) (i)	105.88 / 105.9 / 106;; allow one mark for 140 or 68 or 72	2
(b) (ii)	oxygen; glucose; respiration / energy; CO ₂ ; muscle;	3
(c) (i)	25 857;; allow one mark for 117 or 221	2
(c) (ii)	smaller heart / eq; volume per beat is less; less body mass / less cell present; less demand for glucose / oxygen; less respiration / less energy demand;	Max 3

(Total 11 marks)

Question Number	Answer	Mark
11 (a)	darker / more yellow / orange;	1
(b)	respiration; body temperature increases; reduce body temperature / heat loss; water lost / dehydration / less water in blood / eq; sweating; more water reabsorbed; less water in urine / urine more concentrated / eq;	Max 3
(c)	sweat cannot evaporate; I cannot sweat under water;	2
(d)	carbohydrate / glucose / eq; energy / respiration; fat / lipid; for insulation; ion/salt / named ion; for stated purpose;	2
(e)	sweat / salts; skin; carbon dioxide; lungs;	2

(Total 10 marks)

(Total for paper: 100 marks)

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