Question number	Answer	Notes	Marks
1 (a) (i)	correct reference to oxygen + carbon dioxide;		1
(ii)	1. l ge (surface) area; 2. th / eq; 3. b od supply / capillaries; 4. perm ble;	Ignore thin cell walls	max 3

Question number	Answer	Notes	Marks
1 (b) (i)	S – scale linear; L – straight and through points; A – correct way; A – labelled (breathing rate) <u>per minute</u>/ (breaths) <u>per minute</u> + <u>^{o}C</u>; P – points plotted accurately;	Ignore extrapolation	5
(ii)	breathing rate higher (in warmer water) / mouth opens more often (at higher temperature) / eq;		1
(iii)	different size may need different amount of oxygen / bigger fish may need more oxygen / different size may have different breathing rates / eq;	Ignore idea of fair test	1
(iv)	1. ecies / type / eq; 2. ag 3. ge er; 4. ygen level / volume of water / size of tank / number of fish / source of water / light;	Ignore time / size of fish / type of tank / food	max 2
			Total 13 Marks

Question number	Answer	Notes	Marks
2 (a) (i)	trachea / wind pipe / cartilage; alveoli / alveolus / air sacs;	reject air pockets	2
(b) (i)	X – oxygen / O_2; Y - carbon dioxide / CO_2;		2
(ii)	8.4;		1
(iii)	B diffusion;		1
		Total	6

Question number	Answer	Notes	Marks
3(a)	A (right) lung(s) / intercostal muscle(s); B rib(s) / rib cage; C heart; D diaphragm;	 Allow diaphram	4
(b)	1. diaphragm/D contracts; 2. moves down / flattens / eq; 3. ribcage/B moves up/out / eq; 4. increase in (thorax) volume; 5. decrease in (thorax) pressure;	 Mp3 Allow ribcage expand / ribs expand	5 max
(c)(i)	1. Ff and Ff; 2. FF and Ff and Ff and ff;	Allow TE for children Allow ecf for 1 mark if parents wrong	2
(ii)	1. bacteria / pathogens / microorganisms / microbes; 2. reproduce / multiply / grow / feed / divide / eq; 3. remain in lung / cannot be removed / eq;	Mp1 ignore germs	2

(iii)	1. less air / oxygen / gas; 2. to alveoli / air sacs;		2

Total 15 marks

Question number	Answer	Notes	Marks	
4 (a) (i)	250 000;		1	
(ii)	32;; allow one mark for 80 000 in working		2	
(b)	1. rare / random; 2. change / damage / eq; 3. DNA / gene / allele / genetic code / eq;	random change in cells =2		2
(c)	1. less surface area; 2. slower diffusion / less diffusion / less gas exchange; 3. less oxygen / less carbon dioxide;	ignore less room allow converse for X		2
(d)	1. blocked / narrowed / clogged / eq; 2. <u>coronary artery;</u> 3. lot; 4. at / cholesterol; 5. less blood <u>to heart</u>; 6. less oxygen / less oxygenated; 7. <u>muscle</u> (cells); 8. less respiration / anaerobic respiration; 9. lactic acid / angina; 10. heart attack / heart stops / cardiac arrest / eq;			5

(Total for Question = 12 marks)