Unit 2 Key Area 2 Cellular Respiration Revision Q Mark Scheme

1. C
2. A
3. D
4. D
5. B
6.

a i	lactose concentration/percentage	1
a ii	Temperature/concentration of yeast/pH	1

b	As lactose increases (from 4%) to 16%, ethanol (concentration) increases 1 From 16% (to 20%) ethanol remains constant/levels off 1 As lactose (concentration) increases, ethanol (concentration) increases then levels off = 1 mark	2	Both variables must be named at least once to gain any marks Must mention16% as change point (not 2.8g/cm^3 ethanol)
c	37.5	1	NOT - 38
b ii	Aerobic respiration does not produce ethanol OR Aerobic respiration produces water not ethanol OR No/less fermentation so less ethanol produced	1	

7.	(a)	(i)	To allow (time) for... respiration/metabolic rate... to be affected by... temperature/conditions/change **OR** To allow crickets (time) to... acclimatise/adjust/respond to/get used to... temperature/condition/change **OR** To allow flask/equipment/crickets (time) to reach the temperature	1	Environment / surroundings / situation ≠ flask / conditions NOT – to allow crickets time to adapt NOT – to allow time for (steady rate of) respiration NOT – to acclimatise alone NOT – To allow it to adjust to the conditions NOT – to allow environment to reach the temperature
		(ii)	Description: (exactly) the same... set up/experiment... **OR** full description(same size/volume of flask, in water bath and CO_2 sensor) **AND** (With) no crickets/dead crickets/ glass beads **(1)** Explanation: To show it was the crickets that respired/metabolised/ produced the CO_2 **OR** No... CO_2 production/respiration/ metabolism... without live crickets/ with dead crickets/with no crickets/with control **(1)**	2	NOT – a flask with no crickets NOT – allow comparison alone NOT – to prove the independent variable is causing the result
	(b)		Axes labelled correctly and scales to fill at least half the grid **(1)** Points plotted correctly and joined with a ruler **(1)**	2	Common zero is acceptable 5 boxes = 200 or 5 boxes = 250 are both acceptable scales. Y axis does not have to start at 0 Mark not awarded if line extended to zero from 5°C If axes wrong way around but points plotted correctly, award 1 mark

(c)		As the temperature increased, the (rate of) metabolism increased	1	NOT - rate of... CO_2 production/ respiration alone NOT - As metabolism increases temperature decreases

8.

a	P is Acetyl CoA Q is Oxaloacetate	2
b	ATP/ Energy is required AND A greater amount of energy/ ATP is produced	2
c	Carry hydrogen and high energy electrons AND To the electron transport chain	2
d	• Less ATP/ energy is produced (1) • Fewer electrons are passed to electron transport chain OR • Fewer hydrogen ions are pumped through the membrane (1) OR • ATP synthase is damaged (1)	2

9.	a i	ADP + Pi/phosphate/inorganic phosphate Both required	1	NOT - P
	a ii	NAD	1	NOT - FAD
	a iii	It is a net/overall energy gain (following an energy investment at an earlier stage) OR More ATP/energy is produced/released than is used/invested (earlier/in stage1	1	Quantification acceptable ie 2 ATP used but 4 ATP produced
	b i	Increases the surface area for (action of) bacteria/Lactobacillus OR Bursts cells to release more substrate/cell contents for bacterial action	1	
	b ii	Acidic conditions/low pH/change in pH/decreased pH/anaerobic conditions/low oxygen inhibits/kills/other/most bacteria OR pH/oxygen levels optimum for Lactobacillus but not for other/most bacteria	1	