

1. B
2. C
3. B
4. D
5. C
6. B
7. C
8. C
9. D
10. D
11. A
12. C
13. C
- 14.

(a)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;"><i>Statement</i></th> <th style="text-align: center;"><i>Aerobic</i></th> <th style="text-align: center;"><i>Fermentation</i></th> </tr> </thead> <tbody> <tr> <td>Oxygen is required</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>Pyruvate is formed</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Lactate is formed</td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td>Carbon dioxide is formed</td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">(1)</td> <td style="text-align: center;">(1)</td> </tr> </tbody> </table>	<i>Statement</i>	<i>Aerobic</i>	<i>Fermentation</i>	Oxygen is required	✓		Pyruvate is formed	✓	✓	Lactate is formed		✓	Carbon dioxide is formed	✓			(1)	(1)	2	
<i>Statement</i>	<i>Aerobic</i>	<i>Fermentation</i>																			
Oxygen is required	✓																				
Pyruvate is formed	✓	✓																			
Lactate is formed		✓																			
Carbon dioxide is formed	✓																				
	(1)	(1)																			
(b)	Muscle contraction/cell division/protein synthesis/transmission of nerve impulses/active transport.	1	<p>Acceptable: carbon fixation or any other correctly named example.</p> <p>Not acceptable:</p> <ul style="list-style-type: none"> - photosynthesis - reproduction. 																		

15.

(a)	(i)	1·3	1	Acceptable - correct answer but not in table
	(ii)	Temperature	1	
	(iii)	(Respiration is) controlled by enzymes/enzymes are needed 1 Enzymes have been denatured (at 60°C) or description of denatured 1	2	Enzymes must be mentioned at least once for both marks to be awarded. Not acceptable - reference to denaturing at temperatures 'above optimum'
	(iv)	To show it is the germinating/live peas that are producing the result/using oxygen/respiling OR To show that <u>dead</u> peas do not respire	1	Reference to 'temperature having no effect on dead peas' does not negate an otherwise correct answer
(b)		X - Pyruvate OR Y - Ethanol/alcohol	1	

16.

(a)	(i)	Requires/uses/needs a lot of energy/ATP AND for movement/contraction	1	Both parts required for mark. Not acceptable: <ul style="list-style-type: none"> • requires energy • for respiration
	(ii)	Carbon dioxide/Water/(38) ATP	1	Not acceptable: Incorrect number of ATP
(b)		<u>Glucose</u> converted/broken down to pyruvate/pyruvic acid (1) Pyruvate/pyruvic acid converted to lactic acid (1) (2) ATP produced (1)	3	1 mark if glucose is original substrate and lactic acid is end product. The addition of CO ₂ negates. Arrows are acceptable in place of explanation. Any other number of ATP negates.

17.

(a)	Carbon dioxide		1	
(b)	pH 5	1	2	
	Highest (average) number of bubbles (for most groups)	1		Not acceptable - reference to individual results
(c)	All flasks at same pH	1	2	
	Yeast – different types of yeast in each flask OR Temperature – different temperatures OR Glucose – different glucose concentrations used	1 1 1		

18.

(a)	<u>Aerobic respiration</u>		1
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(b)

(Sperm) require more energy/ATP AND as they move (more)/are (more) active/to swim	1	Must be comparative in terms of energy/ATP.
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19.

(a)	<u>Aerobic respiration</u>		1	Not Acceptable - anaerobic / this is the 2 nd stage of respiration	
(b)	(i)	Glucose		1	
	(ii)	ADP + Phosphate/Pi/ PO ₄ → ATP		1	Complete answer required for mark Balancing not required, but wrongly balanced negates
(c)	(i)	Sprinter Highest lactic acid produced when oxygen is not used to release energy OR Highest percentage light tissue OR Highest fermentation OR Highest percentage of cells that do not use oxygen.	1	2	Second mark can be awarded for correct justification even if first answer is incorrect Acceptable - most, more than all the rest etc. as substitutes for 'highest' Not Acceptable - 'Lowest dark tissue cells'
	(ii)	Swimmer		1	