

- Mark Scheme

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Question	Answer	Marks	AO Element	Notes	Guidance
1	A - aerobic respiration	1			
2	D - sensitivity	1			
3	D - respiration	1			
4	movement ; respiration ; sensitivity ; growth ; reproduction ; excretion ; nutrition ;	4			
5	<i>any two from:</i> movement ; respiration ; sensitivity ; growth ; nutrition ; excretion ;	2			

Question	Answer	Marks	AO Element	Notes	Guidance
6	permanent ; increase in size ;	2			
7	movement ; respiration ; sensitivity ; reproduction ; nutrition ;	3			
8	an increase in complexity / AW ;	1			
9	<i>any three from:</i> removal from the, body / organism / cell ; toxic substances ; waste product(s), of metabolism / respiration ; (named) substances in excess (of requirements) ;	3			
10	B - carbohydrates, fats and proteins	1			

Question	Answer	Marks	AO Element	Notes	Guidance
11(a)(i)	<i>Triticum aestivum</i>	D		max [3]	5 / 6 right = 3 3 / 4 right = 2 1 / 2 right = 1 0 right = 0
	<i>Solanum tuberosum</i>	G			
	<i>Glycine max</i>	C			
	<i>Manihot esculenta</i>	F			
	<i>Ipomoea batatas</i>	B			
	<i>Zea mays</i>	A			
	<i>Oryza sativa</i>	E			

Question	Answer	Marks	AO Element	Notes	Guidance																								
11(a)(ii)	<table border="1"> <tr> <td></td> <td><i>general features</i></td> <td><i>monocotyledon features</i></td> </tr> <tr> <td>1</td> <td>leaf, width / shape ;</td> <td>narrow leaves ;</td> </tr> <tr> <td>2</td> <td>leaf connection to stem / AW ;</td> <td>sheath / no petiole ;</td> </tr> <tr> <td>3</td> <td>number of (named) flower parts ;</td> <td>flower parts in multiples of 3 ;</td> </tr> <tr> <td>4</td> <td>number of, cotyledons / seed leaves ;</td> <td>one cotyledon / seed leaf ;</td> </tr> <tr> <td>5</td> <td>type of root ;</td> <td>fibrous roots ;</td> </tr> <tr> <td>6</td> <td>pattern of vascular bundles ;</td> <td>scattered vascular bundles ;</td> </tr> <tr> <td>7</td> <td>presence / absence of cambium / AW ;</td> <td>no, cambium / woody tissue ;</td> </tr> </table>		<i>general features</i>	<i>monocotyledon features</i>	1	leaf, width / shape ;	narrow leaves ;	2	leaf connection to stem / AW ;	sheath / no petiole ;	3	number of (named) flower parts ;	flower parts in multiples of 3 ;	4	number of, cotyledons / seed leaves ;	one cotyledon / seed leaf ;	5	type of root ;	fibrous roots ;	6	pattern of vascular bundles ;	scattered vascular bundles ;	7	presence / absence of cambium / AW ;	no, cambium / woody tissue ;	1		max [1]	<i>Mark answers in context of either general features (first column) or referring to monocotyledonous plants (second column)</i>
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12	A - growth	1																											

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13	removal from the, body / organism/ cell; poisons/ toxins/ harmful substances; waste product(s), of metabolism/ respiration/ deamination/ chemical reactions; substances in excess (of requirements)/ AW;	3		max [3]	A 'substances that cause harm'/ 'harmful' A named example e.g. CO ₂ , urea, salt, named ions, amino acids, toxic waste of metabolism/ AW = 2 marks
14(a)(i)	lag (phase); log/ exponential (phase); stationary/ plateau (phase); death (phase);	4			

Question	Answer	Marks	AO Element	Notes	Guidance
14(a)(ii)	no longer reproducing/ death rate greater than or equal to 'birth' rate; ref to <u>lim</u> iting factor(s); no/ less, (named) nutrients; no/ less space; no/ less, oxygen; build-up of (named) waste; waste is toxic; idea that pH could change to be unsuitable;	2		max [2]	A reached carrying capacity A lactose/ sugar/ glucose/ salts/ minerals e.g. carbon dioxide/ lactic acid
14(b)	increase in, size/ length/ mass/ volume/ AW; increase in <u>dry</u> mass; increase in <u>cell</u> number; ref to permanent;	2		max [2]	note: increase in dry mass = 2 marks A ref to cell division/ mitosis/ reproduction of cells/ tissues R reproduction unqualified I development
					[Total: 35]