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Paper 3 Advanced Practical Skills 2

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MARK SCHEME

Maximum Mark: 40

Published

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This document consists of **4** printed pages.

Question	Answer	Marks
1(a)(i)	refers to the contents of the test-tubes reaching the temperature of the water-bath ;	1
1(a)(ii)	appropriate statement concerning temperature as a significant source of error with reference to the difference in temperature at the end of the investigation ;	1
1(a)(iii)	table drawn + heading, trial or test-tube ; records 3 times ;	2
1(a)(iv)	Suggests appropriate advantage of carrying out a trial test ; e.g. learning to identify when the end-point reached	1
1(a)(v)	time taken to reach end-point ;	1
1(a)(vi)	correct concentrations of 50, 25, 12.5 + % ; shows transfer of 20 cm ³ of 100 (%) to next dilution + 20 cm ³ transferred from 2 nd to 3 rd beaker and from 3 rd to 4 th + cm ³ ; adds 20 cm ³ of water to each beaker ;	3
1(a)(vii)	1 table drawn + heading, concentration of milk / % + time to reach the end-point / seconds ; 2 records at least 3 times for 3 substrate concentrations ; 3 records the fastest time for the highest concentration of milk ; 4 records times as whole seconds ;	4
1(a)(viii)	replaces milk with water or replaces enzyme with water or uses boiled and cooled enzyme ;	1
1(a)(ix)	states an appropriate concentration of milk ; uses at least five temperatures ; use of thermostatically controlled water-bath ;	3

Question	Answer	Marks
1(b)(i)	1 (x-axis) source of milk + (y-axis) percentage mass of protein ; 2 (x-axis) even width of bars + (scale on y-axis) 2.0 to 2 cm, labelled at least each 2 cm ; 3 correct plotting of five bars + bars in order of table ; 4 five separate bars + bars drawn with thin lines + labelled appropriately ;	4
1(b)(ii)	states that seal milk has the highest concentration of protein ; more enzyme substrate complexes formed or more substrates bind to active sites of enzymes ;	2

Question	Answer	Marks
2(a)(i)	1 plan diagram of appropriate size + no cells + no shading ; 2 correct section drawn + draws at least 3 different layers of tissue ; 3 draws 3 layers of tissue for the central stele or for the edge of the root ; 4 draws air spaces in the cortex ; 5 uses one label line + one label to identify the endodermis ;	5
2(a)(ii)	1 quality of line for the outer wall of xylem vessels + cells of appropriate size ; 2 draws only four xylem vessels + with the large xylem vessel touching each of the other 3 smaller vessels ; 3 cell walls drawn as two lines close together ; 4 draws the largest xylem vessel lumen at least twice the size of the smallest xylem vessel lumen ;	4
2(a)(iii)	correct annotation to lumen (e.g. unrestricted flow of water) or to wall (e.g. prevents xylem vessel collapsing) ;	1

Question	Answer	Marks
2(b)	1 correct measurement of scale bar ; 2 shows length of scale bar in μm, divided by 2499 ; 3 shows length of line, X–Y, divided by answer to mp2 ; 4 decides to record answer in μm ; <i>alternative ways to calculate actual diameter accepted</i>	4
2(c)	any three observable differences of comparison ;;; e.g. on M1 air spaces present while in Fig. 2.2. air spaces absent	3