



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE

0653/61

Paper 6 Alternative to Practical

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MARK SCHEME

Maximum Mark: 40

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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This document consists of **7** printed pages.

Question	Answer	Marks
1(a)(i)	7.5 / 8(%);	1
1(a)(ii)	A 35 and B 20 ; C 120 ; D > 300 ;	3
1(a)(iii)	B at top / D at bottom ; correct order B A C D ;	2
1(a)(iv)	as a control / to find out what happens with only water / to find out what happens with no pepsin / to show that pepsin has an effect / to show that pepsin acts as a catalyst ;	1
1(a)(v)	to maintain constant temperature / to maintain optimum temperature for enzymes / to keep at 40 °C ;	1
1(b)	two or more additional values of percentage or volume ; at least one value less than 15% / less than 2 cm ³ ;	2
1(c)	biuret ; lilac / purple / violet / mauve ; blue ;	3

Question	Answer	Marks
2(a)(i)	E acid F alkali / base ; and	1
2(a)(ii)	delivery tube into container of limewater and delivery tube under surface ;	1
2(a)(iii)	hydrogen ;	1
2(a)(iv)	sulfate ;	1
2(a)(v)	sulfuric acid ;	1
2(b)	ammonia / sodium hydroxide ;	1
2(c)	copper(II) and (ammonia =) blue ppt and dark blue solution or (sodium hydroxide =) pale blue ppt ;	1

Question	Answer	Marks
3	one mark from each section and then any other 3 marks from: 1. apparatus (allow from a <u>labelled</u> diagram) sea water in a suitable container and use of heating device / Bunsen burner ; measuring cylinder ; filter funnel and filter paper (may be from a diagram if the funnel clearly contains a filter paper) ; weighing scales ; 2. method filter to remove insoluble particles (before heating) ; heat / leave so that (all) water evaporates ; repeat for same type of seawater ; wear goggles when heating / wear goggles to prevent solution or salt from going into eyes / wear gloves so salt water does not touch skin / take precaution against hot apparatus e.g. use tongs, wait for apparatus to cool before touching ; 3. measurements and control idea of weighing empty evaporating basin / container ; same amount of water used / quotes volume of water used / measures volume or mass of water used ; measure mass / weigh salts after evaporation ; 4. processing and use of results calculate average mass of salts for each type of sea-water (if measurements repeated) ; calculate percentage mass or mass of salts in fixed volume of water ; compare <u>mass</u> of salts (if same volume used) / states that a larger <u>mass</u> has more dissolved salts ;	7

Question	Answer	Marks
4(a)(i)	78.0 (°C) ;	1
4(a)(ii)	°C ;	1
4(a)(iii)	65.5 (°C) ;	1
4(a)(iv)	reading thermometer perpendicular to the scale / thermometer bulb in centre of liquid / continuous stirring ;	1
4(b)(i)	axes correct way round and axes correctly labelled 'temperature (of water)' and 'time / min' ; suitable linear scale so plots occupy at least half of grid ; five points correctly plotted for either line $\pm \frac{1}{2}$ small square ;	3
4(b)(ii)	smooth best-fit line drawn ; both lines clearly and correctly labelled ;	2
4(c)(i)	(similarity) temperature decreases (with time) (in both experiments) ; (difference) temperature decreases faster in cup without lid ora ;	2
4(c)(ii)	3.5 minutes shown on graph ; candidate's value ± 0.5 (°C) (with a lid) ;	2