Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/63**

Paper 6 Alternative to Practical **October/November 2019**

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Question	Answer	Marks
1(a)(i)	(so that) all surface area in contact with solution / all potato tissue is in contact with (sugar) solution / all potato tissue affected / to allow comparison between tubes ;	**1**
1(a)(ii)	55 **and** 52 ± 1 ;	**1**
1(a)(iii)	–5 **and** –8 ;	**1**
1(a)(iv)	–6.5 ;	**1**
1(a)(v)	18% ;	**1**
1(b)(i)	(increased in length as) water entered potato / more sugar in potato / lower concentration of water in the potato ;	**1**
1(b)(ii)	same concentration of sugar / water in potato and solution ;	**1**
1(c)(i)	0.1 < value < 0.3 ;	**1**
1(c)(ii)	*any three from:* temperature ; type of potato ; same potato ; diameter of potato ; volume of solution ; (initial) length ; time ;	**3**
1(d)	add iodine ; (positive) blue-black / black **and** (negative) brown ;	**2**

Question	Answer	Marks
2(a)(i)	lighted splint **and** pops ;	**1**
2(a)(ii)	**G** sodium hydroxide / NaOH **and** **E** sodium / Na ;	**1**
2(a)(iii)	calcium / Ca^{2+} / copper / Cu^{2+} / Iron(III) / Fe^{3+} / zinc / Zn^{2+} ;	**1**
2(b)(i)	one sealed container containing reaction mixture and delivery tube ; tube enters solution **H** in a an open container ;	**2**
2(b)(ii)	limewater ;	**1**
2(b)(iii)	calcium ;	**1**

Question	Answer	Marks
3	*one mark from each section and then any other 3 marks from:* **1. apparatus** gas collection: measuring cylinder to collect gas / burette / (gas) syringe / balance (to measure change in mass) ; measuring cylinder (to measure volume of hydrogen peroxide) ; timer / stopwatch ; **2. method** reactants in a container with delivery tube into gas syringe or upturned container in water ; measure amounts of gas and take readings of time ; use same amounts of hydrogen peroxide and oxide(s) ; wear goggles to prevent hydrogen peroxide or oxides from harming / entering eyes ; repeat (for the same oxide) ; **3. measurements and control** measure volume hydrogen peroxide / specific amount / same concentration hydrogen peroxide ; same mass oxide (catalyst) ; measure volume / mass of gas given off in fixed time / measure time to collect fixed volume / mass of gas ; **4. processing and use of results** calculate average from repeated readings ; same volume least time is best catalyst / same volume most time is worst catalyst **or** same time largest volume collected is best catalyst / same time smallest volume collected is worst catalyst ; describe how to calculate a rate, e.g. cm^3 / s or 1 / *t* ;	**7**

Question	Answer	Marks
4(a)	0.30 ;	**1**
4(b)	0.77 / 0.767 ; answer to 2 decimal places ;	**2**
4(c)(i)	axes correct way round and axes correctly labelled with units ; suitable linear scale so plots occupy at least half of grid ; five points correctly plotted to ± ½ small square ;	**3**
4(c)(ii)	smooth curve with single, unbroken line through or near to all points ;	**1**
4(d)	as distance increases less force is required **ora** ; non-linear relationship / bigger change in force at small distances **ora** ;	**2**
4(e)(i)	*any two from:* **B** has most appropriate resolution for the readings / divisions are suitable for the readings ; **B** covers the range of the readings / has a larger (maximum) value than the readings / high enough for the readings / goes to 5 N ; **A** has big gaps (between divisions) / each division in **A** is 2.0 N / difference between readings too big / scale is too large ; **C** cannot measure (some of) values (in the table) / **C** cannot measure above 1 N / **C** does not measure high enough ;	**2**
4(e)(ii)	line at 1.8 N marked on newton meter **B** in Fig. 4.3 ;	**1**
4(f)	difficult to read newton meter (while door is moving) / difficult to ensure newton meter is pulled horizontally / at right angles / difficulty in pulling newton meter smoothly / meter reading varies ;	**1**