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Examiners' Report November 2008

IGCSE

IGCSE Science (Double Award) (4437)

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Contents

4437 Science (Double Award) Paper 1F

Too few candidates entered for this paper to be able to compile a meaningful report. Please refer to report Examiner's Report for **Biology 4325** for feedback relating to common questions.

4437 Science (Double Award) Paper 2F

Too few candidates entered for this paper to be able to compile a meaningful report. Please refer to report Examiner's Report for **Chemistry 4335** for feedback relating to common questions.

4437 Science (Double Award) Paper 3F

Too few candidates entered for this paper to be able to compile a meaningful report. Please refer to report Examiner's Report for **Physics 4420** for feedback relating to common questions.

4437 Science (Double Award) Paper 4H

Too few candidates entered for this paper to be able to compile a meaningful report. Please refer to report Examiner's Report for **Biology 4325** for feedback relating to common questions.

4437 Science (Double Award) Paper 5H

Too few candidates entered for this paper to be able to compile a meaningful report. Please refer to report Examiner's Report for **Chemistry 4335** for feedback relating to common questions.

4437 Science (Double Award) Paper 6H

Too few candidates entered for this paper to be able to compile a meaningful report. Please refer to report Examiner's Report for **Physics 4420** for feedback relating to common questions.

4437 Science (Double Award) Paper 07

General information

The paper was felt to be of a similar standard to those set previously. The candidates' performance was felt to be similar to that of the previous series. The paper discriminated well, with a very wide range of marks seen. The full range of marks was seen for each part of each question.

Question 1

This was an easy start to the paper – a practical question about measuring volumes of liquids.
Many candidates scored full marks, although a few did not realise that actual numerical answers were required to part (b).

Question 2

This question tested the candidates' knowledge and understanding of food tests.
Part (a) was answered well, although some candidates put microscope and/or funnel as items needed for testing food samples for glucose. Most knew Benedict's test, although some thought iodine was used. The majority of candidates knew that iodine was used to test for starch. A significant number lost the mark in part (b)(iii) as they simply put 'no colour change', rather than giving the colour of iodine itself, e,g, yellow/brown etc.

Question 3

This question required candidates to 'count' plants in quadrats and to demonstrate their analytical and evaluative skills.
In part (a) many gained full parts in (i) by completing the table correctly. However, few were able to spot the correct anomalous result of quadrat B, buttercup in field X. Instead many gave the 0 figure in quadrat B, buttercup in field Y, or circled more than one result. Most candidates were able to give the correct conclusions in part (b), but a minority did not understand the question or compared the wrong items. In (c) most calculated the total area sampled, although some lost their mark by not giving a unit. Many candidates were able to calculate the estimated population size , but others gained no marks or gained one mark for a part calculation.

Question 4

In this question, candidates were required to plot a graph and to describe and draw conclusions from their results.
The majority of candidates gained full marks in part (a). Some had the axes the wrong way round and others did not put a linear scale. Some candidates only described part of the graph and did not comment on the fact that the graph leveled off, thus losing a mark. Part (b) was poorly answered. Only the better candidates gained full marks, with many not understanding why there were changes in breathing rate. Most candidates gained one mark for either suggesting a method of gaining

more accurate results – usually by saying get someone else to count – but few gained the second mark by giving a reason for their answer.

Question 5

This question tested candidates' knowledge and understanding of enzymes and also their ability to suggest modifications and to evaluate an experiment.
Most candidates gained one mark in the first two sections of part (a). Only the more able gained the second mark in each. Part (iii) was very badly answered. If candidates gained a mark, it was usually for indicating that more readings should be taken. Only the very best candidates referred to measurements at smaller intervals or around 45 degrees. Part (b) was not answered well. Many candidates wrongly referred to temperature, which was the independent variable. About 50% of the candidates gained one or two marks for indicating a more precise way of measuring carbon dioxide production. Some forgot to explain why 'counting bubbles' was not a precise method, whilst others did this, but then did not give a more precise way.

Question 6

This question tested the candidates' understanding of planning and carrying out an experiment. It was based on how temperature affects transpiration in leaves.
Most candidates scored 3 or 4 marks. It was disappointing that the marks were not higher, as this type of question appears on every paper. Many candidates forgot to give examples of fair testing.

4437 Science (Double Award) Paper 08

Question 1

Almost all candidates scored full marks in part (a). In part (b), many candidates thought that a glass beaker might break because of the great heat generated, while several could not find the right words to indicate a method of securing the cup – "in a clamp stand" would have been correct, but not "on a stand", for example. A surprising number were unable to correctly read the thermometers in part (c) – some read each small division as 0.1 rather than as 0.2 °C, while others ignored the fact that the liquid was halfway between two divisions and read to the lower one. The simple point of repeating was usually scored in part (d).

Question 2

In part (a) almost all candidates correctly read the volumes on the gas syringes. In answering part (b), many candidates realised that there was something wrong with the volumes but were unable to express the point precisely enough (eg "used the wrong volume of water", rather than "did not use 25 cm3 of water"), while others were unable to state the correct effect on the concentration or rate. In plotting the graph, more chose to use the volumes of water, rather than volumes or concentration of acid, and some failed to include units. The obvious scale was invariably chosen and the points were usually accurately plotted. A disappointing number drew a straight line even when their points lay on an obvious curve, or included the anomalous point in a distorted curve. The use of the graph to read off the time for equal volumes was usually well done. In part (c), the simple relationship shown by the graph was rarely clearly stated. In part (d), most candidates realised that the beaker had something to do with heat or temperature, but often could not find the right words (eg "to cool the flask" rather than "to absorb the heat produced"). In part (e) most realised the importance of keeping the mass constant, but a disappointing number failed to use their knowledge of kinetic theory in the explanation; some lengthy answers contained neither of the words "particles" or "collisions".

Question 3

Part (a) was generally well done, although several answers referred to the greater capacity or accuracy of the burette. Common errors in part (b) included the omission of the final zero from 13.20 and occasionally reading the scale in the wrong direction (eg 14.80 instead of 13.20). The graph in part (c) was usually well done, with points plotted accurately and straight lines drawn; very few lines did not cross, although a common error was to draw the right hand line directly between the two highest points. The readings from the graph in part (d) were usually correct, but the final part was often given as the same volume as the one read off, rather than subtracting it from 20. In part (e), the idea of using the volumes written down in part (d) proved beyond many candidates. Few good answers were seen in part (f). Several candidates thought that the settling process indicated that the reaction was still occurring, but the description expected in (f)(ii) was frequently blank or that for an unworkable method. The simple steps of filter, wash, dry and weigh did not occur to most candidates, or they included too little detail (eg weighing the residue on the

filter paper without either subtracting the mass of a filter paper, or without removing the residue from the filter paper).

Question 4

Most candidates scored 2 or more marks in this question and, although it was impossible to be sure about the amount of guesswork involved, generally those who scored highly in other questions scored 3 or 4 marks here.. Very few wrote down more than two letters.

General Comments

Questions in this paper are targeted at full range of grades from G to A*.

4437 Science (Double Award) Paper 09

General Information

The examiners were pleased to note the high quality of the work from many candidates.

Question 1

In general this was the best answered question. In (a), nearly all gave filter funnel or funnel. Only a small minority suggested either a cork or rubber bung with a hole or a piece of rubber or (flexible) plastic tubing in (b)(i). Some indicated in (b)(ii) that the glass could break but few suggested that the student might cut herself. Nearly all recognised that (c)(i) is a measuring cylinder or a graduated cylinder. In (c) (ii), most gave the correct reading of 13 (cm^3) though 10.3 (cm^3) was sometimes suggested. Most suggested a stop watch or a stop clock in (d). Many candidates obtained all three marks in (e)(i). The commonest errors were to omit any units for volume and/or to fail to arrange the data in numerical order. Many candidates gained full marks in (e)(ii) but some failed to follow the instructions. The most common errors were either not to give units, to have the axes the wrong way round, to fail to indicate which point is the anomalous point and/or to fail to draw an appropriate line of best fit. In (f), many mentioned that oils are more runny at a higher temperature but few explained that it would not be possible to make a fair comparison unless the temperature was the same for both the engine oil and for the cooking oil.

Question 2

Nearly all candidates were able to suggest a suitable safety precaution in (a) such as noting that no bare wires were exposed or not touching the hot lamp. Most explained in (b) that the black tube prevents entry of light from the side but few explained that as the tube has a relatively small opening then, apart from the light which comes from the lamp, very little light will get in this way. Most suggested a metre rule in (c)(i). Many recognised in (c)(ii) that getting a true reading for the position of the filament and /or the position of the LDR at the end of the tube is the problem in attempting to measure the distance. Some clear, well expressed solutions were suggested in (c)(iii) such as measuring the diameter of the spherical part of the lamp, dividing by two to get the radius and adding this dimension to the distance from the outside of the lamp to the far end of the tube. Both (d)(i) and (d)(ii) were generally correctly answered. Some could not express the answer in (d)(iii) to two significant figures but a similar proportion could not convert milliamps to amps with the result that only a minority gained the marks. In (d)(iv), a significant majority noted that it is not justified to give the answer to more than two significant figures because the values of the voltage and the current are given to only two significant figures. A fairly common error was to suggest that the problem lay with the recurrent figure in the answer to the calculation. Only a minority noted the absence of one or both of the units in (e)(i). Most noted in (e)(ii) that as the distance increases the resistance decreases though some erroneously claimed that the numbers are inversely proportional. Only a minority also noted that as the distance increases the intensity of the light decreases.

Question 3

Most candidates obtained a smaller proportion of their total mark on this question than on either of the other two. Some candidates noted in (a) that dry sand will be more realistic because there is no water on the surface of the Moon. Another sensible suggestion was that dry sand will more easily move to form a crater than damp sand which is more likely to be too firm to do this. In (b), only a minority suggested that the starting conditions need to be the same if fair comparisons are going to be made or that the previous crater needs to be removed to avoid confusion with the most recent crater. A significant minority recognised in (c) that if the experiment is repeated a number of times an average result can be calculated. However few mentioned that the identification and elimination of any erroneous results is another reason. A significant mistake was to assert that this will make the results 'more accurate'. Most correctly measured the diagram and recorded the result in (d). Most correctly noted in (e) that, as the height from which the ball is dropped is increased, the radius of the resulting crater increases. However, only a minority made the point that the rate of increase in the size of the crater gets less as the height increases. Diameter or radius needs to be on the *y*- axis and mass on the *x*- axis and the curve should be convex from the origin. Many candidates gained two marks in (f) but a common mistake was to make the curve form a plateau or to rise to, and then fall from, a maximum value. Some good answers in (g), for example, 'Only one independent variable, either the mass or the height from which it is dropped, should be changed and other variables should remain constant. Otherwise you will not know which variable has caused the change in size of the craters'. However weaker candidates were often unsure or had difficulty in expressing themselves clearly.

SCIENCE (DOUBLE AWARD) 4437, GRADE BOUNDARIES

Option 1 : with Paper 7 (Biology) & Paper 8 (Chemistry)

	A*	A	B	C	D	E	F	G
Foundation Tier				51	41	32	23	14
Higher Tier	72	60	48	37	27	22		

Option 2 : with Paper 7 (Biology) & Paper 9 (Physics)

	A*	A	B	C	D	E	F	G
Foundation Tier				50	41	32	23	14
Higher Tier	71	59	47	36	27	22		

Option 3 : with Paper 8 (Chemistry) & Paper 9 (Physics)

	A*	A	B	C	D	E	F	G
Foundation Tier				51	42	33	24	15
Higher Tier	72	60	48	37	28	23		

Option 4: with Coursework (Paper 10)

	A*	A	B	C	D	E	F	G
Foundation Tier				54	44	34	25	16
Higher Tier	73	62	51	40	30	25		

Note: Grade boundaries may vary from year to year and from subject to subject, depending on the demand of the question paper.

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