OCR
RECOGNISING ACHIEVEMENT

GCSE

Science B

Gateway Science Suite

General Certificate of Secondary Education **J640**

Examiners' Reports

January 2011

J640/R/11J

Oxford Cambridge and RSA Examinations

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of pupils of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support which keep pace with the changing needs of today's society.

This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

OCR will not enter into any discussion or correspondence in connection with this report.

Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

CONTENTS

General Certificate of Secondary Education

Gateway Science B (J640)

EXAMINERS' REPORTS

Chief Examiner's Report

The entry for B621/01 and B621/02 dropped slightly from the corresponding session in January 2010, possibly because of a shift towards the separate sciences and vocational courses. The entry for B622/01 and B622/02 rose slightly, possibly due an increasing number of re-sits.

The papers produced a full range of marks and mean marks were all in the range 25 to 31. Centres appear to have the correct entry policies with only a small number of candidates entered for the incorrect tier.

Candidates have improved their ability to tackle questions involving extended writing. Good use is made of the bullet points which are provided to structure an answer. Candidates perform well on questions requiring data analysis and interpretation and can successfully carry out calculations involving selection of the appropriate formula, substitution and use of calculator to arrive at the final answer. A small number of candidates appear not to have access to a calculator. The writing of chemical equations continues to improve with candidates taking more care over the use of subscripts and upper and lower case in atomic symbols.

Areas of the specification that candidates find difficulty with include:

- first class proteins
- control of cell function by DNA
- negative feedback
- binomial system
- natural selection
- explanation of why reactions are exothermic or endothermic
- intelligent packaging
- multiplexing
- conduction and convection
- use of lasers in CD players
- Earth-Moon system.

B621/01 Foundation Tier

General Comments

The paper produced a mean mark of 28.0 which was slightly lower than the January 2010 performance. The paper gave candidates the opportunity to show what they know, understand and can do. Generally the candidates performed well with only a few papers where marks were really low.

One issue was the candidates' handwriting, which in many cases made marking very difficult.

There were several questions in which nearly all candidates scored poorly because of a simple lack of knowledge of the facts. In other areas, candidates had an understanding of the science behind each topic but were unable to express themselves in clear scientific terms.

The ability of some candidates to structure a chemical equation was disappointing. Frequently the correct components were identified but not necessarily included in the right order. Often arrows or plus signs were in the wrong places and 'heat' was incorrectly placed within the structure of the equation.

The ability of candidates to manipulate data in a table requires further consideration by teachers. Candidates seem to expect to simply read off a given figure rather than having to utilise some sort of deductive reasoning. They seem unaware that three columns of figures are included for a reason and these generally need to be used to achieve the correct answer.

The physics component of the paper was well answered with pupils able to show what they had learned. There is still confusion regarding heat transfer and loss, even though this is a topic which has appeared regularly in past papers. Answers lacked clarity and pupils frequently wrote about 'trapped heat' or 'keeping the cold out'.

Comments on Individual Questions

Section A – Module B1

1 (a) In part (i), many candidates scored two marks and very few did not score at least one mark. The term pathogen was very rarely given in part (ii). Common incorrect answers included insects and antigens.

1 (b) Correct answers were rare here, with the most common errors involving blood cells or antibodies.

1 (c) Again many candidates did not score on this question. Few managed to get the total idea of transfer of blood. Many vague answers were given due to poor use of language rather than lack of knowledge.

1 (d) Many realised that the climate was wrong and others had the idea of no mosquitoes. The better candidates put both of these ideas together.

1 (e) There were few references to enzymes. Some correct answers with dehydration/heat stroke were seen but many simply wrote 'overheat' and lost the mark. A number of candidates thought the question was asking at what temperature humans should be.

2 **(a)** Part (i) was generally very well answered, with a random smattering of other nutrients/foods. In part (ii) most candidates got the right answer, although too many clearly did not have a calculator.

2 **(b)** Very few correct answers were seen. Most referred to hygiene, lack of facilities or poor diet. Some repeated what they had put in (a)(i).

3 **(a)** Well answered, with most candidates scoring at least one mark – many two. The most common error was choosing the last option.

3 **(b)** Most candidates scored the marks in parts (i) and (ii). Those that didn't tended not to make themselves sufficiently clear; they were on the right track but basically said little more than that it was addictive.

4 **(a)** Most candidates wrote one of the correct options (many both). Height was the common wrong alternative offered.

4 **(b)** In part (i), squaring caused a problem for many candidates – many either ignored it or multiplied by two. There were some difficulties with rounding up or down. Part (ii) was generally well answered although many just said anorexic.

4 **(c)** A fairly even split between long-sight and short-sight.

Section B – Module C1

5 **(a)** Very few correct answers were seen in part (i). The weaker candidates came nowhere near an equation and a significant number of the better attempts lost the mark for having '+heat' (still a recurring problem) or sodium hydrocarbonate. In part (ii), again there were very few correct answers. Most were not even aware that a gas was involved.

5 **(b)** Most correct answers in part (i) referred to the food staying fresher rather than preventing reactions with oxygen. Part (ii) was generally well answered – some gave named examples rather than **type** and there was a fair representation by a variety of cooking ingredients.

6 **(a)** Few problems - most candidates scored the marks.

6 **(b)** There were few problems in part (i). In contrast in part (ii) very few correct answers were seen. Most chose meths as it burnt the most fuel, or propanol as it had the highest final temperature. There was little evidence of working with the figures and still poor grasp that the temperature rise is the important factor.

7 **(a)** Most candidates scored the marks although a few got them the wrong way round. Poly (chloroethene) was frequently the second answer.

7 **(b)** The majority scored the marks here but some candidates just gave examples of hydrocarbons from the list. Hydrogen and carbon dioxide or hydro and carbon were often the incorrect responses.

7 **(c)** Only a handful of correct answers were seen. More of the correct answers tended to say 'catalyst' rather than 'high pressure'. Most mentioned 'heat' and a fair number gave uses or properties of polymers or repeated their answers to (a).

8(a) & (b) Generally well answered although some answers were the wrong way round and some with random chemicals.

8 (c) The majority scored the marks – although some just said harmful. Some candidates talked about pollution or greenhouse gases.

8 (d) Generally well answered.

Section C – Module P1

9 Generally well answered – most candidates scored some marks, although less than half got all three (electromagnetic often being incorrect). Many said that radio waves were an example of infrared radiation, rather than electromagnetic.

10 (a) About half of the candidates got this correct – many left it blank. Starch or molecules were common incorrect answers.

10 (b) Most candidates managed to get at least one mark. Where they did not, it was often due to lack of precision. Hearing problems was the popular misconception, whilst cooking or frying the brain were seen too often.

11 (a) A number of candidates got the right idea but many simply gave any form of insulation (eg loft insulation or cavity wall insulation) for the house, rather than the windows.

11 (b) Candidates found part (i) difficult, with very few correct answers. Most, basically said it kept the house warm. There were quite a few who muddled conductor and insulator – and said it was 'a good conductor'. Another area where once again candidates show a really poor grasp of the specification content. Part (ii) was generally well answered.

11 (c) 'Gamma rays' was the most common answer - presumably because aluminium was mentioned, followed by 'light'.

12 Most candidates answered the question well.

13 (a) Generally well answered.

13 (b) Most candidates managed the 'flashes' mark, although a fewer scored the second mark for the representation of letters. Poor language often prevented the candidates expressing the link between flashes and words.

14(a) & (b) Generally well answered, although often poorly expressed in (b).

14 (c) Few correct answers were seen - most gave degrees Celsius or a type of energy usually electricity or electrical rather than the unit.

B621/02 Higher Tier

General Comments

The paper produced a mean mark of 25.0 which was slightly lower than the January 2010 performance. The paper gave candidates the opportunity to show what they know, understand and can do. Marks ranged from 58 to zero. About an eighth of candidates scored less than 20 marks and would have been better served by entry to the foundation tier. Most candidates could access the paper with very few questions omitted. There was no evidence of lack of time. Questions involving 2 or more marks were suitably differentiated for A grade candidates. Performance on calculation questions was generally good even by weaker candidates.

Section A – Module B1

1 (a) The vast majority of candidates scored both marks in part (i). A smaller number also scored the mark in part (ii) for the idea of the transfer of blood from one person to another. A common error was not to mention the transfer to another human. Many thought that the question was about the transfer of the disease from the mosquito to human rather than from human to human.

1 (b) Only the most able candidates knew how high body temperature can lead to death. Many candidates referred to overheating, strokes, heart attacks, organ failure or hypothermia. Dehydration was the most common correct response.

1 (c) '4' was usually correct in part (i), although '46' and '23' were common errors. Part (ii) was generally well answered with 'use nets' being the commonest correct answer. Many wrote too vaguely about 'cleaning water' or 'using a spray' or 'wearing better clothes' without further qualification and did not gain credit. A number of candidates mentioned 'vaccination' and failed to score.

2 (a) That first class proteins contain all the essential amino acids or amino acids that the body cannot make was known by only about 10% of candidates in part (i). Most candidates' responses focused on proteins rather than amino acids, with 'for growth and repair' being a frequent misconception. '12' was usually correct in part (ii).

2 (b) The idea of mutations was understood by about a third of candidates with many answers referring to changes in physical characteristics or something going wrong with cells, rather than focusing on the genes, chromosomes, DNA or base sequence.

3 (a) The calculation of BMI was usually correct in part (i), although a common error was to divide by 1.9, rather than $(1.9)^2$. Incorrect rounding (e.g. 24.6) cost some candidates a mark. 'Underweight' was usually correct in part (ii), with 'anorexic' being the most common incorrect response.

3 (b) Very few candidates displayed an understanding of how DNA controls the function of cells. Many candidates wrote about inheritance of characteristics, often repeating information from the stem of the question. Those who gained a mark gave the word 'code', but few realised what the code was for or that it was a base code. The link with production of proteins/enzymes was rarely seen.

4 (a) Many candidates scored 1 mark, usually for the idea of heat loss. The term 'vasodilation' was only known by the most able candidates. Many candidates thought that the blood vessels themselves moved to the surface of the skin, whilst other answers simply referred to more blood going to the skin rather than to the skin **surface**. Veins and arteries simply getting bigger / wider was another common misconception.

4 (b) The fact that 37ºC is the optimum temperature for enzyme action was known by about half of candidates, although a significant proportion thought that 37ºC is the temperature at which cells or the body works best and did not score.

4 (c) Less than 5% of candidates knew that blood temperature is monitored by the brain. Many gave answers relating to reflex arcs.

4 (d) This A* question was very poorly answered. Candidates failed to articulate their answer in terms of the body **detecting** a change and then responding to it. Simplistic answers such as 'when you get hot you start to sweat' were common.

Section B – Module C1

5 (a) The word equation for the thermal decomposition of sodium hydrogencarbonate still causes candidates problems. Just under half of all candidates scored the mark. Careless copying (sodium *hydrocarbonate*) cost many the mark, whilst a substantial proportion of candidates still include '+ heat' in equations. Other candidates omitted one of the products (often water). In part (ii) the test for carbon dioxide was well known.

5 (b) The section of the specification on active and intelligent packaging continues to cause problems for candidates, with many confusing intelligent packaging with active packaging. Other incorrect answers included 'endothermic' or 'thermal' packaging.

6 (a) This question was well answered with many candidates correctly using the data given to explain that petrol gives out the most energy because it uses the least fuel, but results in the same temperature rise as meths and propanol. Weaker candidates chose propanol (because it had the highest temperature at the end) or meths (because the mass of fuel burned was the highest).

6 (b) This question was generally well answered. Marks were most commonly lost through careless transferring to the answer line of 14,000 as 1400.

6 (c) Answers to this A* question were poor, given that similar questions have appeared on several previous papers. Candidates often scored one mark for appreciating that an exothermic reaction gives out energy, but few related bond breaking and/or bond making to energy changes. Those that did often thought that 'bond breaking gives out energy'. A common error remains the idea that the answer relates to the number of bonds. Weaker candidates answered in terms of 'cracking'.

7 (a) In part (i) about half of candidates knew that an unsaturated hydrocarbon contains a double bond. Many candidates suggested alkenes, rather than considering the bonding in the molecule, or gave vague statements about 'adding on atoms'. Most candidates did not gain credit in part (ii), usually because they stated that bromine water 'goes clear' rather than colourless. A significant minority thought that the bromine water 'turns orange / brown' or stated 'it changes colour' which was insufficient to score.

7 (b) The conditions for polymerisation in part (i) were not well known. Of those who gained a mark, most did for 'catalyst'. The commonest error was 'high temperature' or 'heat'. Many candidates omitted the double bond in the displayed formula of the monomer in part (ii), or drew ethene rather than chloroethene.

8 (a) About half of candidates correctly interpreted the data and suggested that A was the best fuel for powering a car, usually stating that it was a liquid or had good availability. 'B' because it is a liquid, and 'C' because it has good availability were common incorrect responses.

8 (b) This question differentiated well, with the weakest candidates scoring 0. Many candidates scored 1 mark for the correct formulae, but were unable to correctly balance the equation. It is pleasing, following comments in previous examiners' reports to see that candidates seem to be taking much more care with subscripts and the case of letters when writing symbol equations. However a number are still careless writing such formulae as Co_2 or CO2 and losing credit.

Section C – Module P1

9 (a) Most candidates scored at least one mark. However, there were some poor diagrams especially the analogue waves which often tended to be tall and tilted over to one side. Many showed analogue waves as saw teeth, which while just about acceptable, is not really a very good example. A common error was to draw digital pulses with several different heights. There were quite a few examples of drawings of transmitters etc. rather than of the waves / pulses themselves.

9 (b) Only a minority of candidates could describe how digital signals allow more information to be transmitted. Those candidates who did score the mark usually did so for 'multiplexing'.

10 (a) Most candidates scored at least 1 mark, with many scoring 2. There was no obvious common misconception in the incorrect answers given.

10 (b) In describing how mobile phone companies try to avoid signal loss, very few candidates actually mentioned transmitters. Many referred to 'more aerials' or 'more masts' or 'placing the masts on top of hills', which were just about acceptable. Incorrect answers often referred to mobile phones themselves or to making the signal greater (without mentioning frequency of amplification).

11 (a) The vast majority of candidates had little understanding of why fibreglass reduces energy loss by conduction in part (i). Many thought that the fibreglass simply traps the heat in the house or that the fibreglass traps the moving hot air within its structure. The mark scheme required candidates to mention 'trapped air' (1) and 'air is a good insulator' (1). In contrast, virtually all candidates correctly calculated the payback time as 5 years in part (ii).

11 (b) About 20% of candidates understood how energy is transferred by convection, correctly explaining that hot, less dense air rises or vice versa. Common errors were references to 'heat particles' or to 'air particles becoming less dense'. Many drew diagrams showing the air moving horizontally through a partition wall or wrote about the differences in density of the air and the wall.

12 **(a)** 300 minutes in part (i) was usually correct. '35' (15 minutes + SPF of 20) was a common error. In part (ii) candidates who failed to gain credit often gave imprecise answers such as 'darker skin absorbs more of the sun's rays. Another common error was to suggest that dark skin reflects more UV / does not absorb as much UV.

12 **(b)** 'Ozone' was usually correct in part (i). Candidates scored less well in part (ii), with the most common error being a failure to mention UV radiation. Sunlight / sun / heat were often seen instead and failed to score. In part (iii) CFCs were not particularly well known. There was lots of confusion with greenhouse gases - carbon dioxide and methane being common answers.

13 **(a)** This question was well answered by just over half of candidates. The second marking point for relating flashes to letters etc was not always seen. Flashes or dots and dashes were the commonest acceptable answers.

13 **(b)** Both parts (i) and (ii) were very poorly answered and often omitted. In part (i) mention of 'pits' or 'indents' in the CD was required and the idea of reflection was required in part (ii).

B622/01 Foundation Tier

General Comments

The paper produced a wide range of marks. Few candidates scored more than 50 marks and few less than 20, suggesting that centres have the correct entry policy. The mean mark was 31.0 marks, which is slightly up on the equivalent paper in January 2010. The paper gave candidates the opportunity to show what they know, understand and can do. Most candidates could access the paper and very few questions were omitted. There was no evidence of lack of time.

Section A – Module B2

1 (a) This question was well answered by over 80% of candidates. If an incorrect response was offered, it was usually 'E'.

1 (b) This was correctly answered by just under half of candidates. A small number ticked more than one box and failed to score.

1 (c) Glucose was well known in part (i). The idea that starch is stored was less well understood in part (ii). Many thought that starch was 'food for the plant' and failed to score.

2 (a) Most candidates correctly identified 'endangered' and 'ecosystem'. 'Community' was a common incorrect answer for the second response.

2 (b) Most candidates could correctly recall 'predators' in part (i). Part (ii) was less well answered with most candidates gaining one mark. Some candidates mentioned the osprey's beak without an appropriate qualification and failed to score. Many correctly identified 'claws' or 'talons'. References to vision often stated that the 'eyes were on the sides of the head' and did not score.

2 (c) This question was well answered. Weaker candidates thought that 'fishermen eat the ospreys'.

3 (a) Three quarters of candidates correctly read 1967 from the graph. Most wrong answers were 1966 or 1968.

3 (b) Again, most candidates could correctly calculate 5500.

3 (c) Part (i) was very poorly answered with few candidates understanding the link between sulfur dioxide pollution with burning fossil fuels. Many mentioned cars, factories or just 'pollution' and failed to score. A higher proportion of candidates scored the mark in part (ii), often for recognising that the world population is increasing. Just over half of candidates correctly answered part (iii). A number looked at the overall trend in the graph rather than the specific years they were asked about.

4 (a) Less than 5% of candidates correctly answered this question. Many talked about the name being in Latin or about genus and species.

4 (b) Most candidates did not appreciate the idea of competition. Many suggested that 'humans killed the rats' or that 'brown rats fought or preyed upon black rats'.

4 **(c)** Most candidates failed to appreciate that warfarin killed rats and that, over time, rats developed a resistance. Many candidates merely repeated the question and talked about 'warfarin controlling rats'. Many stated that rats become 'immune to warfarin' and failed to score.

Section B – Module C2

5 **(a)** The vast majority of candidates correctly identified 'water'. 'Brick was the most common incorrect response.

5 **(b)** Only about a third of candidates correctly wrote the word equation in part (i). Equations frequently had '+ heat' on the left hand side and failed to score. A number wrote the equation in reverse. Only about a quarter of candidates understood thermal decomposition in part (ii). Many candidates confused this with exothermic or endothermic reactions.

5 **(c)** Many candidates scored at least 1 mark, usually for destruction of habitats, noise or dust. There were unqualified references to 'pollution' which did not score.

6 **(a)** Only about half of all candidates could work out the total mass of carbon dioxide given off after 3 minutes. Most could read the correct value from the table for the total mass of the flask and reaction mixture after 3 minutes, but could not then perform the necessary subtraction.

6 **(b)** About three quarters of candidates could read off the graph in part (i), although a number tried to use minutes and seconds and lost the mark. Half of candidates correctly stated that the line was steeper for powdered marble chips or that powdered marble chips finished first in part (ii). A number stated that 'the graph goes higher' or 'the graph is longer' and failed to score. Part (iii) was very poorly answered. Few candidates mentioned increased surface area and even fewer that there would be more collisions. A lot stated that there were 'more particles' or re-stated the question.

7 **(a)** This question was well answered by almost 80% of candidates.

7 **(b)** Most candidates identified 'decoration' or 'protection' and scored the mark.

8 **(a)** Part (i) was well answered by almost all candidates. Fewer were able to articulate the correct answer in part (ii). A comparison between the weight losses in distilled water and salt water was required.

8 **(b)** Most candidates scored 1 mark usually for recognising that the metals could be used again. Fewer mentioned the higher level answers involving saving resources or the reduction in disposal problems. There were a number of vague references to 'pollution' or 'the environment' and 'saving money' which did not score.

9 **(a)** This question was well answered with most candidates understanding that plates move or collide.

9 **(b)** Again, this was well answered with 'core' being a relatively common incorrect response for magma.

Section C – Module P2

10 (a) Very few candidates scored all three marks. 'Light' was the most frequently gained correct response in the first blank space. Some candidates put 'electric' in the second blank space and 'number' in the third blank space.

10 (b) Less than half of candidates understood that the magnet (or coil) must be moved in part (i). A number wanted to 'use a battery' or 'connect the magnet into the circuit'. Less than 10% of candidates knew that power stations produce alternating current. 'Nuclear' and 'heat' were common misconceptions.

11 Over three quarters of candidates could correctly perform the calculation. A few scored one mark for the substitution but could then not go on to perform the calculation and arrive at an answer.

12 This was very poorly answered. Many referred to the Earth's gravity pulling an object in to make the moon. Where marks were scored, it was usually for the idea of a collision. Often candidates thought that a collision knocked off a single 'chunk' which then became the moon.

13 (a) Most candidates scored 1 mark, usually for mentioning protective clothing. Better candidates referred to remote handling. The idea of short exposure time or monitoring badges was rarely seen.

13 (b) This question was not well answered. A significant proportion of weaker candidates simply repeated their answers from part (a). 'Bury underground' was the most common correct answer. Worryingly a number of candidates suggested 'dump at sea' or 'send into space'.

14 (a) Candidates appeared to like the novel context of a crossword. Most identified the 'sun' and 'moon'. 'Galaxy' was the least well answered.

14 (b) A significant number of candidates scored both marks. Those who scored 1 mark frequently reversed the first two responses.

14 (c) The majority of candidates scored 2 marks.

B622/02 Higher Tier

General Comments

This was the ninth occasion this examination was available to be sat by candidates. There were approximately 10200 candidates and marks ranged from 0 to 57 out of 60. Approximately a quarter of the candidates achieved a grade A or A* but there were a minority who might have been better targeted at foundation tier.

The mean mark for the paper was 29.9 and the paper discriminated satisfactorily over the target grade range of A* to C. The paper allowed candidates to demonstrate positive achievement in all three areas of science.

There was little evidence that candidates had insufficient time to complete the paper and the only question which was omitted by a significant number of candidates (24%) was 4(b)(ii). A small minority of candidates did not follow instructions regarding how to answer questions or how many answers to provide. Where the intentions of the candidate were clear, marks were awarded.

Candidates are encouraged to show how they work out the answer to numerical questions. In this way, credit can be given for showing how an answer is obtained, even if the answer is incorrect. It was pleasing to note that this was more evident than in the past. In general, calculations were well answered by all candidates.

Some examiners reported that poor handwriting from some candidates made marking difficult and in extreme cases may have cost marks.

Comments on Individual Questions

1 (a) This was intended as an accessible starter, but it did differentiate across the grades. Fewer than two thirds of candidates scored the mark with many suggesting that plants are invertebrates.

1 (b) The formula of glucose is not well known. Many candidates had not read the question correctly and wrote either the word or symbol equation for photosynthesis. If the formula for glucose was correct and labelled, a mark was awarded. Half the candidates could explain why sugar is changed into starch.

1 (c) In general, this was well answered. Most related the spines to reduced water loss. Some referred to the surface area reducing water loss but without relating surface area to volume.

2 (a) Most candidates knew the correct answer. Those who did not usually referred to birds being vertebrates and reptiles invertebrates. The reason for the incomplete fossil record was generally known, the most common answer relating to them being as yet undiscovered.

2 (b) Candidates were expected to respond in terms of benefit to the community by increased employment or income from tourism. Many candidates referred to educating the local people in the care of the osprey.

2 (c) The majority realised that the osprey would take the fish from the fishermen.

3 (a) The majority of candidates scored full marks. Those who did not, usually divided by 20.

3 (b) Fewer than half the candidates identified acid rain and the name for sulfur dioxide pollution. Global warming was a common answer. A significant number of candidates answered yes to the evidence from the graph; many of those who answered no then went on to provide vague answers which did not clearly convey the idea of an insignificant change.

3 (c) This was not well answered. Only a fifth of candidates scored the mark. Many tried to find fault with the mathematics or wrote about the numbers going up and down. Only the most able discussed the idea of lack of samples or them being non-representative.

4 (a) Very few candidates appear to have met the term binomial.

4 (b) Although most candidates scored one or two marks, there was a general misconception about the terms tolerance, immunity and resistance. These seemed to be thought of as synonyms and were often used interchangeably during a response. A quarter of candidates wrote nothing about the difference between Lamarck's and Darwin's explanations. The remainder generally did not refer to acquired characteristics but mentioned genes carrying the information.

4 (c) Despite the prompt in the stem of the question most wrote about people's religious beliefs in some form or other.

Section B – Module C2

5 (a) The majority of candidates were able to interpret the written text and write the correct word equation. The most common error was to include heat in the equation. Thermal decomposition was generally described satisfactorily, but many wrote about breaking down into elements or breaking down a mixture.

5 (b) The idea of steel increasing the strength was generally known, but its flexibility or concrete's hardness was less well known.

6 (a) Most candidates scored the mark.

6 (b) The candidates who failed to score the mark appeared to write their answer as minutes and seconds but without stating this clearly; 2.48 as an answer failed to score the mark.

6 (c) The majority of candidates described how the lines on the graph showed the powdered marble reacted faster. Those who failed to score provided vague answers relating to a faster time. The idea of more collisions was well known but some candidates had difficulty in expressing the idea of the powdered marble having a larger surface area.

6 (d) This was not well answered. Candidates should have read 0.3g from the graph and divided by 0.5minute to obtain a reaction rate. Many converted half a minute into seconds so divided 0.3 by 30. Others thought half a minute was 0.3 and obtained the answer 1g/minute.

7 **(a)** Continental plates were well known, oceanic were less so. Pacific, Atlantic and tectonic were common answers. Diagrams showing how the plates moved were often lacking in detail. Many showed one plate and/or one convection current. The direction of motion of the plate did not always match that dictated by the convection current.

7 **(b)** Many candidates related crystal size to rate of cooling but some reversed the effect so failed to score the mark.

8 **(a)** There were few who failed to score both marks.

8 **(b)** Candidates must be careful in their use of upper and lower case when writing equations. Carbon monoxide (CO) can easily be confused with cobalt (Co). Similarly, the use of subscripts must be clearly shown. There were few superscripts, but a good number of CO2 were to be seen as the symbol for carbon dioxide. A quarter of candidates failed to balance the equation correctly.

9 Evaporation of the paint solvent was more widely known than the oxidation of the oil. There were a number of candidates who reversed the processes.

Section C – Module P2

10 **(a)** There were many good answers. Those who failed to score marks made vague references to renewable or cheap.

10 **(b)** Many candidates scored the mark. The most common answer was to increase the number of coils. Bigger magnet was a common incorrect response.

10 **(c)** Only a third of candidates correctly identified where the current reversed; most chose the first peak as the point. Most could identify one complete cycle although a significant number chose point C.

11 More than 90% of candidates scored both marks. A good number scored 1 mark for correctly showing their working.

12 **(a)** Whilst many candidates referred to a collision, this was often between the old Earth and the Moon. Many wrote that the Moon came close to the Earth and was attracted by gravity into an orbit. The information required was in the question stem and this was ignored.

12 **(b)** This was not well answered. There were references to craters on the Moon and on Earth, the Big Bang theory, and identical elements. A fifth of candidates did not attempt the question.

13 **(a)** The majority of candidates scored one mark for the idea of burying the waste. Marks for reprocessing were occasionally awarded. The process of vitrification was mentioned by one or two candidates.

13 **(b)** The question referred to the level of radioactivity and how this might be a problem. Many candidates wrote about cancers and other biological effects of the radiation instead of the levels of radiation.

14 **(a)** This was generally well answered.

14 **(b)** The most common error was to reverse one of the pairs. Few scored no marks.

14 **(c)** A quarter of candidates scored both marks. Many suggested the Sun as the source of gravity.

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

14 – 19 Qualifications (General)
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations
is a Company Limited by Guarantee
Registered in England
Registered Office; 1 Hills Road, Cambridge, CB1 2EU
Registered Company Number: 3484466
OCR is an exempt Charity

OCR (Oxford Cambridge and RSA Examinations)
Head office
Telephone: 01223 552552
Facsimile: 01223 552553