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Examiners' Report Summer 2009

IGCSE

IGCSE Chemistry (4335)

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4335 Chemistry Paper 1F Section A

Questions in this section are targeted at grades G to E.

Question 1
This question was generally answered well.

Question 2
Part (a) was generally answered well.
In part (b) candidates were required to select words in order to complete sentences concerning a reversible reaction. While the best candidates scored full marks, many answers suggested random guessing – it was not uncommon for the reaction to be described as both exothermic and endothermic in the same direction. The reversible reaction concerned is specifically mentioned in the specification and candidates are expected to have used anhydrous copper sulphate as a qualitative test for water and to have heated hydrated copper sulphate.

Question 3
This question was about the Haber process. In (a) many candidates were unable to name the elements that are reacted together to make ammonia, carbon dioxide and oxygen were common incorrect answers. Of the candidates who could name the elements involved, many were under the misapprehension that hydrogen occurs in significant quantities in the atmosphere or that the reaction between a metal and an acid is an economically viable method of producing it. In (b) candidates simply stated "high" rather than give an acceptable value.; those who did give numerical values often failed to give units. Once again it should be stressed that candidates should be discouraged from giving ranges for numerical values; if they give a range it must be fully within the accepted range in the mark scheme – hence both the lower and upper limits given by the candidate must be acceptable values and so the candidate has a better chance of gaining the mark if they just give one of the values. Part (c) was poorly answered, many substances unrelated to ammonia were seen, a common near miss was to fail to use "ammonium" for the name of cation ("ammonia nitrate" was seen often). Since the question asked for the names of chemicals, general answers such as "fertilisers" were not accepted.

Question 4
Part (a) (i) was generally answered well.
The most common answer in (a)(ii) was bromine, although many candidates did gain the mark. In (a)(iii) some candidates did not understand the table, thinking that in the column headed "State symbol" they had to state the symbol of the substance – this is despite the state symbol of hydrogen chloride already being completed. While some good answers were seen there were many that contained seemingly random colours; both chlorine and hydrogen chloride were not infrequently thought to be alkaline; it should be noted that the descriptor "clear" does not mean "colourless". Very few candidates used (aq) as the state symbol for hydrochloric acid.
In (b) some good word equations were seen, although there was some miss use of the –ine and –ide endings, however, some candidates seemed not to be familiar with halogen displacement reactions and compounds such as "chloride bromine" were not uncommon.
The explanation in (c) was rarely correct, of the candidates who based their answers on relative reactivities many tried to compare the reactivity of bromine to sodium or to sodium chloride.

Question 5
Parts (a) and (b) were generally answered well.
In part (c) candidates gain one mark for realising that combustion was the reaction with oxygen and a second mark for knowing the products of complete combustion of a hydrocarbon. Few candidates scored both marks, oxygen was frequently seen as a product and some candidates tried to burn substances other than octane. In part (d) most candidates could identify carbon monoxide as the toxic gas, but much fewer could explain why it is poisonous; errors included the idea that it stopped the lungs working or prevented the blood flowing.

Question 6
Part (a) was very poorly answered, very few candidates knew that fluorine was diatomic and in (ii) charges were frequently missing or the wrong way round. In part (b), while some good answers were seen, many had electron transfer going the wrong way and some candidates seemed to think that the dots and crosses were merely decoration rather than symbols representing sub-atomic particles. Few correct answers were seen, it was common to have lithium undergoing reduction and fluorine oxidation.

Question 7
In (a) candidates were required to write a chemical equation, at foundation tier candidates can not be asked to balance an equation, and so any equation they write will not require any stoichiometric coefficients; despite this some candidates lost marks by attempting to balance the equation – these attempts may have been triggered by having incorrect formulae due to their not recalling the valencies of the ions. The table in (b) usually gave the candidates some marks, most commonly for the names of the products however, flame test colours were usually wrong and silver bromide was often thought to be white.

4335 Chemistry Paper 1F Section B

Questions in this section are targeted at grades D and C.

Question 8
While a few very good answers were seen to this question, some candidates seemed very confused about the common uses of metals. Of those candidates who could name zinc as a metal used to prevent rusting, very few could explain why in terms of reactivity – most seemed to think that zinc did not react with oxygen/water. It was common for candidates to state that aluminium was “light”, it is not, the mass of aluminium depends on how much there is; “light” is not the same as “low density” although it is a common error for aluminium to be referred to as a light metal. Worryingly copper was sometimes thought to be a good for electrical wiring because it is an insulator. Most candidates who names iron or steel as used for railway tracks could relate this use to its strength.

Question 9
Parts (a), (b) & (c) were generally answered well.
Part (d) was poorly answered at foundation tier with most candidates just stating a recalled fact (“they are unreactive”) rather than using the information provided to draw a conclusion.

Question 10
In (a) it was not uncommon for candidates to lose marks through careless use of terminology – with hydrocarbons being described as “elements” or “atoms” and carbon/hydrogen being described as “molecules” or “ compounds”. Very few candidates gained the mark in (b) at foundation level; many were thinking about saturated solutions. Of those that did focus on the bonding a common error was to state something along the lines of “carbon has formed the maximum number of bonds”; in all stable organic compounds each carbon forms four bonds, at least one of which will be a sigma bond and the remainder pi bonds.
Part (c) was generally answered well
Most candidates drew the correct structure in (d), although some structures had incorrect valencies. A common error in (e) was the use of the term “isotopes” in place of “isomers”. Many errors were made in (f), it was common for the polymer to contain double bonds.
In 10 g(i) few candidates were able to correctly name the type of polymer.
Part (g) (ii) was generally answered well

Question 11
At foundation tier in (a) many candidates managed to pick up one mark for stating either the crystals get smaller or the water becomes green, few gained both marks. Some vague answers were given such as stating the water changed colour but not saying what colour.
Part (b) was generally answered well.
In (c) although many candidates seemed to know that it would be faster they either did not say what was faster or thought that a chemical reaction was occurring. Only the most able foundation candidates could explain why the process was faster at higher temperatures with many failing to refer to particles of some type.

Question 12
Part (a) was the only section of this question on which foundation tier candidates scored well. In (b) (i) the most common product was sulphuric acid, and water was also commonly seen as a product (despite it being a reactant). Surprisingly few candidates identified the ion that causes acidity, many focussed on the sulphur; this resulted in few correct answers in (iii), of those answers that were along the right lines, some added metals that were so reactive they would react with water.
Few candidates at foundation tier gained marks in (c) – most thought the mass would drop because the electrode loses electrons while those who correctly stated the mass would increased failed to use the equation given and based their answer on impure copper sticking to it. Part (d) was not as well answered as expected, many answers made no attempt at a comparison of reactivity and just stated “copper in unreactive”. In (d)(ii) it should again be stressed that “clear” is not the same as “colourless”, some candidates focussed on the colours of the metals despite the question stating that the colour change of the solution was required.

4335 Chemistry Paper 2H Section A

Questions in this section are targeted at grades D and C.

Question 1

This question was about the uses and properties of metals. The responses were better than those to similar questions in previous papers, with fewer candidates failing to identify the correct metals. The commonest error was to select aluminium for the three uses other than for aircraft bodies, although steel for aircraft bodies and titanium for railway tracks were sometimes seen.. Although only one property was asked for, candidates often listed two or more, sometimes relevant, sometimes irrelevant although rarely contradictory. For zinc, the commonest errors were the unqualified "reactivity", "less reactive than iron" and "more reactive than (unspecified) other metals", and "sacrificial protection" (without stating a property). As in previous sessions, "light" was not accepted as equivalent to "low density" for aluminium. Some less able candidates misinterpreted the electrical wiring diagram and talked about its insulation properties

Question 2

This question was about the reactions of elements in the Periodic Table. In (a), although most candidates correctly identified francium as the most reactive metal, lithium and actinium were often seen. In (b), common errors were NaFr and NaFl. The selection of statements in (c) was generally well done, with the formation of carbon dioxide and an acidic solution being the commonest errors. In (d), although the majority of candidates correctly described the trend, quite a few had the trend reversed or did not describe a trend but wrote that all the Group 0 elements were unreactive.

Question 3

This question was about hydrocarbons, and was generally very well attempted, although there were places where many candidates lost marks. In (a), careless use of terms was often seen, such as describing hydrocarbons as elements or carbon and hydrogen as molecules, and the crucial "only" or equivalent wording was often omitted. In (b), again the crucial "only" was often missing; it is not sufficient to state that saturated compounds contain single bonds, since unsaturated ones also do. Other unacceptable wording included " every carbon has four bonds", "all carbons atoms are joined to four hydrogen atoms". Those who answered in terms of the lack of double bonds were often more successful. Very few errors were seen in (c) and (d). In (e), the molecular formula was invariably correct, with a small minority writing C_nH_{2n+2}, although the usual isotopes and allotropes sometimes appeared in (d)(ii). Part (f) was more of a problem, with a variety of errors seen; these included the presence of C=C rather than C–C, the absence of continuation bonds, the inclusion of four or more CH_2 groups without a modification of n to ensure balancing, the omission of n and using n as a coefficient or superscript. Part (g) was generally well done, although common errors in (g)(i) were addition, alkene and polyester.

Question 4
This question was about the dissolving of a salt in water. Parts (a) to (c) were generally well attempted, although in (a) several answers made no reference to the change in appearance of the crystals ("dissolve" was not accepted because this was stated in the question), while others made no reference to the green colour. In (c), the idea of particles having more energy or moving faster was well known, but several answers were spoiled by describing the process as a reaction. Few candidates scored full marks in (d), and there was much confusion between ammonium and ammonia. The addition of sodium hydroxide solution was often omitted, or reagents such as hydrochloric acid and silver nitrate were given. Although litmus was often quoted, all too frequently it was dipped into the solution. The colour change was sometimes the wrong way round, and bleaching was occasionally stated.

Question 5
This question was about the extraction of copper. Part (a) was usually correct, but in (b) many equations showed the formation of H_2SO_4 rather than H_2SO_3, and ions other than H^+ were listed, including sulphite and sulphate; sometimes the test quoted was for hydrogen gas rather than for the hydrogen ion. Part (c) was well attempted, the commonest omission being to state that copper ions were attracted to the cathode without including any reference to the formation of copper atoms. In (d), the reactivity was invariably correctly described, but a wide range of colours was seen in the reaction with magnesium. The colour of copper(II) nitrate solution was often quoted as blue-green, with the product given as white or clear rather than colourless.

4335 Chemistry Paper 2H Section B

Questions in this section are targeted at grades A*, A and B.

Question 6
This question was about alkenes. Parts (a) and (b) were generally well done. In (c) the colour change in the bromine water test sometimes did not include the starting colour or described the colour of liquid bromine instead, and occasionally the colour change was the wrong way round. It was pleasing to see relatively few using clear instead of colourless. In (d)(i), although many all-correct answers were seen, there was some confusion with fermentation and other industrial processes, so aluminium oxide and iron appeared as catalysts. The type of reaction in (d)(ii) was well known, but in (d)(iii) few candidates were able to give a structural formula for the ester; near misses had one oxygen missing, or methyl propanoate instead of ethyl ethanoate, or the ethyl group written as $-CH_3CH_2$, but blanks and a wide range of non-existent compounds also appeared.

Question 7

This question was about the Haber process. Part (a)(i) was well answered, although natural gas as a source of nitrogen and air as a source of hydrogen were occasional errors. Methane was not accepted in place of natural gas as it is not a raw material. The equation in (a)(ii) caused problems for many candidates; although some gave NH_4 instead of NH_3 as the product, most errors involved the use of the symbols N and H instead of the formula N_2 and H_2. Part (b) posed few problems for most candidates. Answers to (c)(i) were generally poor, with many candidates describing the formation of ammonia, and several descriptions of separation referred to fractional distillation or ammonia being denser and sinking to the bottom. The attempts in (c)(ii) to describe recirculation sometimes foundered because it was not clear that the unreacted gases were immediately returned to the reactor (answers such as "used again" and "stored to make more ammonia" were not accepted). Part (d) produced few all-correct answers. Apart from those who gave the names of non-existent compounds (such as nitrogen sulphate) the commonest naming error was "ammonia sulphate". Many equations showed NH_4SO_4 or $(NH_3)_2SO_4$ as the product, often accompanied by H_2 or H_2O, which may explain "displacement" frequently appearing as the reaction type.

Question 8

This question was about hydrogen and water. Part (a) was no problem, but in (b) many descriptions of a covalent bond failed to mention a **pair** of electrons. The explanation in (c) sometimes referred to the breaking of a covalent bond or did not extend to mentioning the small amount of energy needed to overcome the intermolecular forces. The dot and cross diagrams in (d) were generally well drawn; the few errors included the presence of six non-bonding electrons rather than four in the outer shell of oxygen, an extra electron in the hydrogens' outer shells and two oxygens joined to one hydrogen atom. The calculation in (e) was generally well done, although common errors were incorrect numbers of bonds broken or formed and the subtraction done the wrong way round. The diagrams in (f) were invariably correct, although they often included extra information. Part (g) was usually correct. Very few equations in (h) were correct; those that gained some credit showed the wrong number of water molecules or used (aq) for the state symbol of the product. Rather more showed extra products such as H_2 or O_2 or the formation of non-existent compounds such as H_2CuSO_5.

Question 9

This question was about the isotopes and chemistry of copper. The definition of isotopes in (a) often failed to score both marks; sometimes there was no mention of atoms, or a correct statement that the numbers of protons were the same was contradicted by one that stated that the numbers of electrons were different, or had the protons and neutrons in the wrong parts of the answer. The completion of the table and calculation of the relative atomic mass in (b) was usually correct, with few candidates failing to quote the answer to the required one decimal place. Most knew how to calculate the relative atomic mass, with just a few averaging the two mass numbers. In (c) a wide variety of elements were quoted, with copper and chlorine appearing frequently, along with the predictable hydrogen. Part (d) was well answered, although in (e), many properties that were generally true for all metals were given, instead of those specific to transition metals. Part (f) was poorly answered, with many errors in the colours and the two equations, although in (g) more able candidates knew the formula of Cu_2O, while less able ones wrote formulae that were not oxides.

Question 10

This question was about salt preparations and their associated calculations. Very few candidates scored full marks in (a); many failed to mention filtration, while others started from the reagents instead of from the mixture mentioned in the question. The commonest errors were to omit the washing step or fail to state how the water would be removed from the residue. Some who mentioned filtration then evaporated the filtrate rather than drying the residue. The calculations in (b) were very well done, with few arithmetic errors and few using wrong methods. The commonest error was in (b)(iii), where either atomic numbers instead of atomic masses were used for calcium sulphate, or the M_r of another compound (frequently sulphuric acid) was calculated. Part (c) was well done with few errors of either method or arithmetic.

4335 Chemistry Paper 03

Question 1

Most candidates, as expected, scored well on this question. The vast majority of candidates could name all five items of equipment in (a). In (b) a small number of candidates names equipment that was not shown in the picture, nor given in the box. Part (c) was the most discriminating part of the question with sodium chloride/sugar being a not uncommon choice.

Question 2

This question was based on the separation technique of chromatography.
While many candidates scored well in (a), some candidates answers suggested that they had never seen or conducted the process of chromatography. There were suggestions that the paper should be fully submersed in water; that the paper should be horizontal (as in radial chromatography) and that a lid should not be used or that the lid was not tight enough. Chromatography is a simple, safe and relatively quick technique and it is hoped that all candidates will have the opportunity to use it in the laboratory. In (b), while most candidates could determine the number of colours in the blank ink, in (ii) some confused the term “ink” and “colour” and just listed the colours of the spots produced by the black ink. In (b)(iii) a common error was to think that the fact the blue ink did not split into different colours showed that it was insoluble; if this was the case then the red ink would also be classed as insoluble, which it clearly was not. To answer (c) candidates did not need to have been taught about R_f values since details of how to do the calculation was given in the question. However, some candidates seemed not to have a ruler with them in the examination and so estimated the distances, other chose to ignore the instruction in the question to include units. The answer in (ii) could be to any number of significant figures, but if a number is rounded it must be done correctly.

Question 3

Part (a) required **two** things that must be kept constant to make the investigation a fair test. Candidates still need to be reminded that if they state more than two things, then all will need to be correct if they are to avoid losing marks. It was very common for candidates to suggest that the mass of magnesium hydroxide or the temperature of the acid should be kept constant – despite these being the independent and dependent variables respectively. In this specification “amount” is taken to mean “moles” - and so if the “amount” of acid is kept constant it could mean, for example, a larger volume with a lower concentration – which would not make it a fair test.
Part (b) required a change to the apparatus, many candidates focussed on the measurement of mass or volume, and so stated apparatus that would give accurate values (such as burettes), however, since in the question no indication of how the mass or volume were measured was given, no improvement is possible. The only apparatus in the method is a “glass beaker” and so improvements were expected to be based on this in order to reduce heat losses. A water bath is not appropriate since this will reduce the temperature increase measured.
Most candidates scored the marks in (c), although some had difficulty with the scale on the thermometer. The most common error in (d) was to ignore the instruction that the mean should be given to one decimal place, or to incorrectly round 7.5333 to 7.6.
In common with requirements on previous papers, the explanation in (e) must explain the direction of anomalous result – so explanations had to explain why the temperature change was too high. Hence answers such as “wrong mass of magnesium hydroxide” do not score, but “too much magnesium hydroxide” does score. Again, candidates should

avoid putting multiple reasons; if more than one reason is given none can be wrong if a mark is to be awarded.
The graph in (g) caused some problems; for some reason it was not uncommon to plot one of the last three points incorrectly, despite having plotted the first four points correctly. The instruction was to draw two straight lines yet many candidates attempted to do this without a ruler or drew more than two lines. In (g)(ii) it was not uncommon for candidates to ignore the command word "describe" and instead try and "explain", they could still gain full marks if their explanation also contained a description, but they generated extra work for themselves.

Question 4

Part (a) was generally answered well. Many candidates gained full marks for completing the table in (b). However, some candidates failed to record all of the data.
Only the most able candidates gained marks in the remaining parts of this question. In (c) the idea of the tap being open was rarely seen, one common wrong answer was to state that not enough iron was used (any amount of iron would still cause some change in water level) while it was not uncommon for candidates to enter into an explanation based on pressure and the trough of water – suggesting that the water level would never change in this experiment.
In (d) a few candidates spotted that we did not know the starting volume for the air but few could suggest a solution to the problem; some suggested entirely different experiments.

Question 5

Common errors in (a)(i) were to fail to label the axes or to put the wrong scale on the y axis. In (ii) some volumes were given in units of "g" and it was not uncommon for the scale 0n the x-axis to be read incorrectly. Candidates need to be careful to ensure that their tie-lines are horizontal/vertical and not sloping as this results in incorrect readings. It was common in (iii) for candidates to just require the whole experiment to be repeated – this will not help determine the volume for the maximum mass of precipitate – it will still be some where between 4 cm^3 and 6 cm^3, candidates should be used to the idea of taking more reading around the turning point on a graph.
Part (b) revealed that a large number of candidates were suffering from a major misconception about mass change in chemical reactions. The most common totally wrong answer was based on the idea that when the solutions are mixed the total mass will increase as the precipitate is formed. Where candidates realised that the best approach is to remove the precipitate and weigh it, the most common omission was to fail to wash the precipitate to remove soluble substances from the reaction mixture.
In (c) most candidates gained the marks in (i) but in (ii) some candidates chose to ignore the information in the table and used alternative reactions to differentiate between an aluminium and a zinc salt; unsurprisingly the vast majority of these were doomed to failure.

4335 Chemistry Paper 04 (Coursework)

The total number of centres entering candidates for this component of the examination increased again this year.

The moderating instrument used was the Sc1 criteria previously used by home centres, using exemplars provided by the JCQ (Joint Council for Qualifications) as a guide.

Generally the work seen was of grade C or higher standard, with very few grade G candidates. The marks awarded by the centres for investigations for the separate sciences tended to be high and a number of full marks were seen in the samples and the average mark for the centres' assessments was in the mid twenties. In fact the lowest mark for a number of centres was in the low twenties.

Skill Area P: Planning

Comprehensive and detailed scientific information was often written but it was not always used sufficiently to support predictions and inform plans. Students did not always consider the control and monitoring of all relevant factors when they were planning how to obtain reliable evidence as often no plan was made to control or monitor the ambient temperature during the course of the investigation even though students had stated it was a variable to consider. As a consequence, it was not always possible to support the award of P.8a. Most students carried out some form of preliminary work involving the establishment of the range to be investigated, but on occasions some other factor was investigated, such as a suitable time duration for the osmosis activity. Students did not always appreciate that in order to satisfy P.8b they should show how this preliminary work informed the main investigation that they were going to perform.

Skill Area O: Obtaining Evidence

Many of the centres and their students failed to recognise that taking averages of results where there are significant variations, does not give reliable evidence. Very rarely did students identify these anomalies and then repeat the measurements so that they could ignore rogue results when calculating averages. Occasionally students averaged the readings for individual components such as voltage and current for a particular length before carrying out a calculation to determine the variable linked to the investigation (i.e. resistance) and, if the values of the item being averaged showed significant variations, then the reliability of the evidence was compromised. Some students did not appreciate the need to control and monitor significant variables. The obvious one being the ambient temperature at which the investigation was carried out. For these reasons, rarely was it possible to support the centre's award of eight marks for this Skill Area. However, most students were able to justify the award of at least six marks by the systematic and accurate means they had collected and presented their evidence.

Skill Area A: Analysing and Considering Evidence

Most students were able to carry out the required calculation for the factor under investigation, i.e. percentage change in mass of potato stick, rate of chemical reaction and resistance of a wire, and then use this information to draw the graph of the evidence, with a line of best fit in the form of the expected straight or curved line, thus achieving A.6a. Detailed scientific knowledge was often used to discuss the evidence to produce a valid conclusion, but this evidence was not always the processed evidence shown by the graph. Sometimes the data in the table of results made the award of A.8a problematical. It was good to see discussions that often considered the shape or angle of the graph in order to determine the exact relationship between the variables investigated. Students still find it difficult to discuss the prediction in terms of the processed evidence displayed in the graph and often ignored the tentative nature of any relationship displayed by the scattering of plotted points around the line of best fit, making the award of A.8b difficult to justify.

Skill Area E: Evaluating

Most students were able to identify anomalous results and make some comment on the quality of the evidence obtained and so satisfy E.4a. Discussion of the procedure and identification of possible improvements was surprisingly weak in some cases, although E.4b had usually been awarded. Most students understood that any further work suggested had to be described in some detail and justified in terms of the original task, either by extending the range investigated or by investigating a linked factor for E.6b to be awarded. However, discussion of the reliability of the evidence obtained and, in particular, explaining the cause of identified anomalies, was not always easily accomplished, yet E.6a seemed to be freely awarded in a number of cases.

At most centres there was clear evidence that internal standardisation had been scrupulously carried out, and there appeared to be consistency in assessment across the various groups in a large entry. The marks were always confined to a single investigation for the separate sciences (two could have been used) and mainly just two for the Double Award Science entries when a maximum of four investigations is possible.

Chemistry 4335

The most common task seen this year was once again a rates task – sodium thiosulphate / hydrochloric acid. One centre did combustion of alcohols as an alternative. This latter task usually scores high marks. Marble / acid, and magnesium / acid were seen as alternative rates tasks, as was the reaction between copper sulphate and zinc. One centre's students had investigated the rate of reaction of calcium carbonate powder with hydrochloric acid solutions and some at another centre had investigated the iodine clock.

The thiosulphate / hydrochloric acid rates task was a very common task in UK centres, but it does have some disadvantages. Firstly, if the students (or teacher) decide to investigate the effect of varying the concentration of sodium thiosulphate solution, it is difficult for the students to incorporate sufficient scientific knowledge to fully access P8a.
It is more appropriate to study temperature as the variable, so that students can discuss exo and endothermic steps, as well as the concept of activation energy.

Centres which awarded full marks for the visual disappearance of a cross in the thiosulphate/acid task were too generous. The observation of a cross disappearing as the precipitate of sulphur forms is a subjective matter, and therefore it lacks **precision**. (Precision is a key factor in the award of O8a). For this investigation a ceiling of 7 marks in skill O is normally applied during moderation because of the subjective nature of the time for the cross to disappear.
Please note also that the requirements of O6a and O6b should be fully met before O8a is considered.

Students who choose to investigate the effect of varying temperature on the reaction rate, should be encouraged to record the actual temperatures used. Quoting temperatures to the nearest ten degrees (perhaps following the range of temperatures stated in the planning phase) lacks precision.

CHEMISTRY 4335, GRADE BOUNDARIES

Option 1: with Written Alternative to Coursework (Paper 3)

	A*	A	B	C	D	E	F	G
Foundation Tier				56	44	32	21	10
Higher Tier	79	67	55	43	32	26		

Option 2: with Coursework (Paper 04)

	A*	A	B	C	D	E	F	G
Foundation Tier				59	46	34	22	10
Higher Tier	81	69	57	46	34	28		

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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