



LEAVING CERTIFICATE EXAMINATION

2001

PHYSICS AND CHEMISTRY

HIGHER AND ORDINARY LEVELS

CHIEF EXAMINER'S REPORT

1. INTRODUCTION

The examination in Leaving Certificate Physics and Chemistry at both Higher and Ordinary levels is based entirely on a written paper. The paper has two sections, dealing with Physics and Chemistry respectively. There are six questions in each section and candidates must attempt any three questions from each section. The total mark for the paper is 400.

A total of 1024 candidates sat the Leaving Certificate examination in Physics and Chemistry in 2001. This represented 1.8% of the total Leaving Certificate cohort of 56 686. Of the total number of candidates taking Physics and Chemistry, 755 (73.7%) took the Higher level paper and 269 (26.3%) took the Ordinary level paper. The numbers taking the subject at Higher and Ordinary levels in 2001 and the previous two years are given in Table 1.

Table 1 Numbers of candidates taking Physics and Chemistry at Higher and Ordinary levels in each year

| Year | Total Number | Higher level | | Ordinary level | |
|------|--------------|--------------|------------|----------------|------------|
| | | Number | Percentage | Number | Percentage |
| 1999 | 1370 | 958 | 69.9 | 412 | 30.1 |
| 2000 | 1053 | 786 | 74.6 | 267 | 25.4 |
| 2001 | 1024 | 755 | 73.7 | 269 | 26.3 |

2. PERFORMANCE OF CANDIDATES

HIGHER LEVEL

The numbers and percentages of Higher level candidates achieving each grade in the 2001 examination are shown in Table 1.

Table 2 Numbers and percentages of candidates achieving each grade in Higher level Physics and Chemistry in 2001

| | A | B | C | D | E | F | NG | Total |
|-------------------|------|------|------|------|-----|-----|-----|-------|
| Number | 86 | 205 | 198 | 172 | 55 | 30 | 9 | 755 |
| Percentage | 11.4 | 27.1 | 26.2 | 22.7 | 7.3 | 4.0 | 1.2 | |

The grade distribution in 2001 was not significantly different from previous years. Details of the numbers and percentages achieving each grade in each of the years 1999 to 2001 are given in the Appendix.

Details of the average mark per question and the popularity of individual questions are given in Table 3. The performance of candidates is given as the average percentage mark per question, while popularity is given as the percentage of candidates attempting each question. Data given in this table, and quoted later in the report, are based on a random sample of 120 scripts, approximately 16% of the total.

Table 3 Performance of candidates and popularity of questions in Higher level Physics and Chemistry in 2001

| Section | Question No. | PERFORMANCE | | POPULARITY | |
|---------|--------------|------------------------------|------------|-------------|------------|
| | | Average Mark per Question(%) | Rank Order | Attempts(%) | Rank Order |
| I | 1 | 69.4 | 1 | 89 | 2 |
| | 2 | 58.8 | 6 | 75 | 4 |
| | 3 | 56.8 | 8 | 64 | 8 |
| | 4 | 62.3 | 4 | 30 | 9 |
| | 5 | 63.5 | 3 | 15 | 11 |
| | 6 | 58.0 | 7 | 69 | 6 |
| II | 7 | 67.0 | 2 | 91 | 1 |
| | 8 | 61.7 | 5 | 81 | 3 |
| | 9 | 53.6 | 10 | 65 | 7 |
| | 10 | 51.7 | 11 | 71 | 5 |
| | 11 | 54.2 | 9 | 11 | 12 |
| | 12 | 33.5 | 12 | 19 | 10 |

ORDINARY LEVEL

The numbers and percentages of Ordinary level candidates achieving each grade in the 2001 examination are shown in Table 4.

Table 4 Numbers and percentages of candidates achieving each grade in Ordinary level Physics and Chemistry in 2001

| | A | B | C | D | E | F | N/G | Total |
|-------------------|-----|------|------|------|------|------|-----|-------|
| Number | 6 | 30 | 64 | 74 | 46 | 39 | 10 | 269 |
| Percentage | 2.2 | 11.1 | 23.8 | 27.6 | 17.1 | 14.5 | 3.7 | |

The grade distribution in 2001 was not significantly different from previous years. Details of the numbers and percentages achieving each grade in each of the years 1999 to 2001 are given in the Appendix.

Details of the average mark per question and the popularity of individual questions are given in Table 5. The performance of candidates is given as the average percentage mark per question, while popularity is given as the percentage of candidates attempting each question. Data given in this table, and quoted later in the report, are based on a random sample of 40 scripts, approximately 15% of the total.

Table 5 Performance of candidates and popularity of questions in Ordinary level Physics and Chemistry in 2001

| Section | Question No. | PERFORMANCE | | POPULARITY | |
|---------|--------------|------------------------------|------------|-------------|------------|
| | | Average Mark per Question(%) | Rank Order | Attempts(%) | Rank Order |
| I | 1 | 59.2 | 2 | 100 | 1 |
| | 2 | 61.5 | 1 | 82.5 | 2 |
| | 3 | 35.6 | 10 | 35.0 | 10 |
| | 4 | 42.3 | 8 | 37.5 | 8 |
| | 5 | 30.9 | 11 | 30.0 | 11 |
| | 6 | 43.5 | 6 | 52.5 | 6 |
| II | 7 | 46.1 | 5 | 80.0 | 3 |
| | 8 | 52.3 | 4 | 55.0 | 5 |
| | 9 | 54.4 | 3 | 62.5 | 4 |
| | 10 | 43.0 | 7 | 20.0 | 12 |
| | 11 | 40.2 | 9 | 42.5 | 7 |
| | 12 | 30.3 | 12 | 37.5 | 8 |

3. ANALYSIS OF PAPERS

HIGHER LEVEL

Q.1 **Average mark 69.4%** **Attempts 89%**

This was the second most popular question overall and the most popular in Section 1. It was also the best answered question overall. The four parts requiring visual answers – (e), (g), (h) and (k) – were well answered.

- (c) This was poorly answered – an example rather than an expression was usually given.
- (d) This was also poorly answered, with ‘expansion’ being a common error.
- (i) Many candidates gave correct types of electromagnetic radiation, but in the reverse order.
- (o) Many answers were not specific – the terms ‘nuclei’ and ‘atoms’ were seldom used.

Q.2 **Average mark 58.8%** **Attempts 75%**

This was the second most popular question in Section 1. However, it was not very well answered – it ranked fifth out of the six questions in the section.

‘Newton’s second law’ and ‘force’ were well known. However, the definition of acceleration was rarely correct; the phrase ‘with respect to time’ was frequently omitted.

The graph was usually well done. Common errors included:

- scale not uniform;

- axes not labelled;
- line not best fit, straight or through the origin;
- points not plotted neatly or accurately.

Many candidates failed to calculate the slope of the graph accurately. Many did not use the slope to find the mass of the trolley. Common errors in this part of the question included:

- not using points *on* the line when finding the slope;
- averaging the values given in the question;
- incorrect use of the formula $F = ma$, e.g. $m = a/F$.

Good labelled diagrams and a detailed account of the experiment showed that candidates were familiar with the experimental procedure, but very few gave details of the measurements taken and so lost nine of the fifteen marks for this part of the question.

The calculation was well done, the principal error being the failure to convert 90 cm to metres.

Q.3 **Average mark 56.8%** **Attempts 64%**

This question was not very popular and not well answered. Marks were not as high as usual for this topic, although the format of the question was very similar to previous years.

The laws of refraction and the difference between the two types of image were well known.

In describing the experiment many candidates mixed up the converging lens with the convex mirror. Many candidates did not include a precaution as required.

The calculation was poorly attempted. Some candidates were unable to get the correct mathematical relationship between the image distance and the object distance. Most candidates forgot to use negative values for f and v . Most candidates did not give the nature of the image formed.

The diagram of the telescope was well attempted. As in the previous part of this question, most candidates did not give the nature of the image.

Q.4 **Average mark 62.3%** **Attempts 30%**

This was not a popular question but it was generally well answered.

- Boyle's law, the experiment to verify it and the first part of the calculation were well answered. However, candidates had difficulty with the second part of the calculation.
- Very few candidates gained full marks for 'ideal gas' – the second part of the definition, 'at all temperatures and pressures', was usually missing or incorrect.

The explanation of temperature in terms of the kinetic theory was very poorly attempted. The calculation of the number of moles was well attempted by those candidates who knew the relevant formula.

Q.5 **Average mark 63.5%** **Attempts 15%**

This was the second least popular question overall but it was the third best answered.

- (a) The experiment was well known and the calculation was done correctly by most candidates. However, very few candidates were able to explain why the ammeter should have a small resistance.
- (b) The laws of electromagnetic induction and the parts of the generator were well known but the functions of the parts of the generator presented difficulties for some candidates. The sketch of the graph was well attempted.

Q.6 **Average mark 58.0%** **Attempts 69%**

This question was fairly popular and fairly well answered. Parts (a) and (c) were the most popular parts of the question.

- (a) Many of the candidates who answered Q.2 answered this question immediately after it. Most of them scored better in this question than in Q.2. In the experiment, the most common error was failing to explain how the speed of the trolleys was obtained. The calculation was well done – the most common error was neglecting to use a negative value for the velocity of one of the carriages.
- (b) This part was not popular and was poorly answered. The difference between constructive and destructive interference was well explained but the resultant was often not stated or shown. The calculation was reasonably well attempted when the correct formula was used but was very poorly done when candidates attempted to use the formula $n\lambda = s \sin \theta$. Few converted the units correctly or gave the correct answer for ‘the effect on the fringes’.
- (c) Many candidates failed to give full definitions for ‘nuclear fission’ and ‘nuclear fusion’ and so obtained only three marks in each case. Many candidates gave the changes in the nucleus in reverse order. The calculation at the end was generally well answered.
- (d) This part was not popular and was not well answered. The factors determining the capacitance were known, although the word ‘common’ in reference to the area of the plates was often omitted. Part (i) of the calculation was fairly well attempted, although candidates experienced problems with the units. Few candidates succeeded in obtaining answers for parts (ii) and (iii). Most candidates were able to give an example of a device that contains a capacitor and were able to state the function of the capacitor.

Q.7 **Average mark 67.0%** **Attempts 91%**

This was the most popular question overall. It was the second best answered question overall and the best answered in Section 2.

Parts (b), (c), (g), (h), (l), (m), (n) and (o) were well answered.

Parts (f), (i), (j) and (k) were poorly answered.

- (d) Many candidates confused ‘hydrolysis’ with ‘electrolysis’.
- (e) Many candidates had a correct example but only one correct valency and so still lost three marks.

Q.8 **Average mark 61.7%** **Attempts 81%**

This question was the second most popular and the second best answered in Section II.

The definitions were generally well known but for 'atomic orbital' a surprising number referred to 'tracks where electrons orbit the nucleus'. Part (i) caused confusion, with some candidates giving a common explanation for all the elements while others did not make it clear which pair of elements they were referring to in their answer.

The electronic configurations were generally well known. The calculation of A_r was attempted correctly by most candidates.

Q.9**Average mark 53.6%****Attempts 65%**

This question was not well answered, although it was reasonably popular – seventh overall.

- (a) The definition of 'heat of formation' was well known but most candidates scored only three marks for the definition of 'heat of reaction'. The calculation was well attempted. Very few candidates knew either the condition for the reaction to occur or a use for tetrachloromethane – most answers appeared to be mainly guesses.
- (b) Most candidates were able to arrange the elements in the correct order but many failed to give a comparison which would justify the order – in particular they mentioned that copper may react over a period of time.

Q.10**Average mark 51.7%****Attempts 71%**

This was the third most popular question in Section II but it was poorly answered, ranking eleventh overall.

- (a) Many candidates gave only a partial explanation of strong and weak acids – most answers merited only six of the twelve marks assigned to this item. The formulae for the conjugate bases were frequently omitted or poorly answered.
- (b) The full definition of 'pH' was rarely given – the reference to 'base 10' was frequently omitted. The calculation in part (i) proved very difficult for candidates. Part (ii) was correctly answered in most cases.
- (c) The calculations in this part were generally well attempted.

Q.11**Average mark 54.2%****Attempts 11%**

This was the least popular question on the paper but was the third highest scoring in Section II.

This question was generally well answered. The main areas that were not well answered were the 'use of ethyne' and part (iv). Part (v) was well answered by a small number of candidates.

Q.12**Average mark 33.5%****Attempts 19%**

This question was the second least popular in Section II and the third least popular overall. It was the least well answered question overall. Parts (a) and (c) were the most popular.

- (a) Faraday's second law was not well known.
- (b) This part was very poorly answered – very few gave correct answers for (iii). The balanced equation also proved difficult for candidates.
- (c) This was generally fairly well answered. However, many candidates lost marks for the shape of the CH₄ molecule.
- (d) This part was very poorly answered. The 'products' in part (ii) were rarely named correctly, as were the 'uses' in part (iii).

ORDINARY LEVEL

Q.1

Average mark 59.2%

Attempts 100%

This was the most popular question overall and it was the second best answered question overall. Parts (b), (l) and (m) were well answered.

- (c) This was poorly answered.
- (e) Many candidates gave 'mirror' incorrectly as a use.
- (f) This was also poorly answered, few were able to complete the ray diagram.
- (g) Many candidates answered this incorrectly, giving 'radio' as an answer.
- (i) Very few candidates answered this correctly.
- (k) Very few candidates knew the answer; 'force' was a common incorrect answer.
- (n) This was incorrectly answered for the most part.
- (o) Very few candidates knew the answer to this part.

Q.2

Average mark 61.5%

Attempts 82.5%

This was the second most popular question and the best answered question overall.

- (a) Newton's third law was well known but the first and second laws were often confused with each other. Many candidates did not know the correct formulae. Errors included leaving out the square on 't' and incorrect substitution in the equations; $s = (2.5)(5) = 12.5$ was a common attempt at the calculation of the distance travelled by the block. Units were generally correct.
- (b) Kinetic energy and the principle of conservation of energy were well known but some gave the principle of conservation of momentum instead. Attempts at the calculation were only fair, with many candidates calculating the kinetic energy incorrectly; $(1000)(20) = 20\,000$ J was a common attempt at this calculation. The change in kinetic energy was generally understood. However, many answered that it changed to potential energy, possibly because the car had stopped.

Q.3

Average mark 35.6%

Attempts 35.0%

This question was one of the less popular questions and was poorly answered.

- (a) The definition of temperature was not known and candidates has little understanding of what was meant by 'thermometric property'. Most gave 'expansion' as the thermometric property of the mercury thermometer. The question on the experiment was not well answered; many described the calibration of the constant volume gas thermometer rather than the mercury thermometer.
- (b) The section on Brownian motion was well answered.

Q.4 **Average mark 42.3%** **Attempts 37.5%**

This question was not very popular and was not particularly well answered.

The definition of refractive index was not known; the definition of refraction was commonly given instead. 'Definition of total internal reflection' was poorly answered.

The experiment to measure the refractive index of a liquid was not well answered. Significant parts of the experiment were not described, e.g. the measurements were omitted, the angles i or r were not shown or the equation was not given.

The attempts at the calculation of the angle of refraction were poor; a very common attempt was ' $40 \div 1.5 = 26.66^\circ$ '.

Very few candidates were able to give two uses for total internal reflection.

Q.5 **Average mark 30.9%** **Attempts 30.0%**

This was not a popular question, ranking eleventh out of twelve. It was poorly answered.

- (a) The definition of electric current was not known. The description of the experiments was well answered. In describing the second experiment, some showed that a current-carrying wire has a magnetic field around it. Most candidates knew one device, 'motor' being the mostly commonly cited.
- (b) Many candidates omitted the laws of electromagnetic induction. Very few candidates were able to give a practical application of electromagnetic induction.

Q.6 **Average mark 43.5%** **Attempts 52.5%**

This question was fairly popular and it was fairly well answered. The most popular parts of this question were (a) and (d).

- (a) Even though this was the most popular part of the question, it was not well answered. The definition of capacitance was not known. While the experiment was generally known, key items of information were frequently omitted, e.g. the electroscopes and the result. The most common use given for capacitors was 'to store charge'.
- (b) This part of the question was avoided almost completely and, when attempted, it was very poorly answered.
- (c) This part of the question was reasonably well answered. Ohm's law was well known. However, attempts at the definition of potential difference were poor. Part (ii) of the calculation was not well done.
- (d) This part of the question was poorly answered. Many used the equation $I = V \times R$; ' $6 \times 2 = 12$ ' was a common incorrect answer.

Q.7 **Average mark 46.1%** **Attempts 80.0%**

This was the third most popular question overall and the most popular in this section. It was reasonably well answered.

Parts (a), (f), (g) and (m) were well answered, while parts (c), (i), (j), (k), (l) and (n) were poorly answered.

- (b) Candidates did not know the the definition of 'atomic orbital'.
- (d) Very few candidates knew the correct shape of the ammonia molecule.
- (o) This part was frequently attempted by candidates but the calculation was not well done.

Q.8 **Average mark 52.3%** **Attempts 55.0%**

This question was quite popular and was quite well answered.

- (a) While many candidates read the electronegativity values correctly, most failed to follow through and make reference to the difference between the electronegativity values being greater than 1.7. Candidates tended to give a name *or* formula for 'another ionic compound' but not both for one compound as was required. Many candidates did not know the properties of ionic compounds.
- (b) The definitions of 'mass number' and 'isotope' were well known. In the final part of the question, many had the answer for $^{12}_6\text{C}$ correct but gave an incorrect answer for the number of electrons and protons in $^{14}_6\text{C}$, while having the number of neutrons correct.

Q.9 **Average mark 54.4%** **Attempts 62.5%**

This was the best answered question in this section and was the fourth most popular overall.

- (a) Hess's law was well known. The calculation was well answered.
- (b) Candidates gave the definitions correctly. However, many candidates gave 'the substance oxidised' and 'the substance reduced' in reverse order. Many candidates gave 'water' incorrectly as the oxidising agent.

Q.10 **Average mark 43.0%** **Attempts 20.0%**

This question was the least popular overall, though it was fairly well answered.

The definition of 'standard solution' was well known by candidates, while the definition of 'neutralisation' was less well known.

- (i) Candidates performed well on this part of the question.
- (ii) Most candidates were able to name a suitable indicator for the titration. However, many gave only one colour at the end-point.
- (iii) The calculation was done quite well by those who attempted it.

Q.11 **Average mark 40.2%** **Attempts 42.5%**

This question was fairly popular though it was the second lowest scoring question in this section.

- (a) The term 'saturated' was mixed up with 'saturated solution', while the meaning of 'homologous series' was not known. Candidates were unable to name the compounds but were able to draw the structural formulae. The name 'alkanes' was not generally known by candidates.
- (b) The definitions were well known. Even though candidates knew the definitions correctly, many failed to identify the acid and the base correctly.

Q.12**Average mark 30.3%****Attempts 37.5%**

This question was not a very popular question and it was the least well answered overall.

- (a) This was the least popular part of the question. The definition of 'mole' was not well known. Very few got part (i) correct.
- (b) Very few candidates knew why the water was acidified or could name the metal used for inert electrodes. Many candidates were able to identify the gases liberated and to give a correct test to identify one of the gases.
- (c) Many understood the basis of the activity series. In part (i) candidates were able to give a reaction for potassium with water but did not carry it through for the other elements. Parts (ii) and (iii) were not well known.

4. GENERAL COMMENTS

There were some areas in the syllabus that candidates had not covered in the detail required. Laws and basic definitions, e.g. acceleration, temperature, atomic orbital, were not as well known as in previous years.

Many candidates answered either Section 1 (physics) or Section 2 (chemistry) well. However, very few candidates answered both sections well.

At Higher level, questions in Section 2 were generally not as well answered as those in Section 1 – the four lowest scoring questions were in Section 2. The organic and inorganic chemistry questions were neither popular nor generally well answered.

Answering in certain questions in Section 2 showed a lack of basic chemistry skills, e.g. the writing of correct chemical formulae, the balancing of chemical equations and the correct use of chemical terms.

Very basic mathematical skills were lacking in many cases, especially at Ordinary level. In several calculations candidates substituted correctly but performed the basic computations incorrectly. The other areas of difficulty included:

- the inability to solve problems involving fractions and exponentials;
- the inability to use the calculator correctly and to show the steps involved;
- failure to record units with numerical answers.

While the better candidates had little difficulty with the graph question on the Higher level paper, for many candidates there were a number of skills in this area that needed to be improved. These included:

- selecting a suitable scale;
- plotting the values correctly;
- plotting the correct values on the x- and y-axes so that a particular value can be calculated directly from the slope
- calculation of the slope

Many candidates did not appear to know exactly what should be included in the description of an experiment. Diagrams were good and well labelled and the accounts contained information on how to assemble the apparatus and details of how to conduct the experiment. However, many accounts did not contain details on how to record the necessary data.

A significant number of candidates did not attempt six questions. Some of the candidates who did attempt six questions attempted four questions from one section and two from the other section instead of attempting three questions from each section as required. This resulted in these candidates being marked out of five questions rather than six. A number of candidates presented blank scripts.

5. RECOMMENDATIONS FOR TEACHERS AND STUDENTS

There is a need to improve basic mathematical skills. In several calculations candidates substituted correctly but performed the basic computations incorrectly.

The understanding of basic chemistry needs to be improved and attention needs to be given to definitions, balancing equations, and to the writing of chemical formulae and chemical equations. Likewise, attention needs to be paid to basic definitions in physics.

A balanced coverage of both areas, physics and chemistry, is important so that candidates can attempt the required number of questions from each section of the paper.

Candidates should attempt three questions from Section 1 and three questions from Section II, as required by the examination paper, i.e. six questions in total. Candidates should be aware that they cannot satisfy this requirement by answering, for example, four questions from one section and two from the other, as marks will not be awarded for more than three questions from one section.

When writing accounts of their practical work students need to ensure that all relevant material is included. In particular, a complete account must include details of the physical quantities measured and of how these quantities were measured.

APPENDIX

Physics and Chemistry Higher Level

Table A1 Grade distributions in Physics and Chemistry Higher level for years 1999-2001

| 1999 | A1 | A2 | B1 | B2 | B3 | C1 | C2 | C3 | D1 | D2 | D3 | E | F | NG | TOTAL |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|--------------|
| Total | 87 | 65 | 57 | 71 | 97 | 83 | 94 | 86 | 69 | 68 | 73 | 78 | 28 | 2 | 958 |
| %Total | 9.1 | 6.8 | 5.9 | 7.4 | 10.1 | 8.7 | 9.8 | 9.0 | 7.2 | 7.1 | 7.6 | 8.1 | 2.9 | 0.2 | |
| Total Female | 45 | 40 | 30 | 34 | 45 | 31 | 34 | 30 | 15 | 15 | 14 | 20 | 4 | 0 | 357 |
| % Female | 12.6 | 11.2 | 8.4 | 9.5 | 12.6 | 8.7 | 9.5 | 8.4 | 4.2 | 4.2 | 3.9 | 5.6 | 1.1 | 0.0 | |
| Total Male | 42 | 25 | 27 | 37 | 52 | 52 | 60 | 56 | 54 | 53 | 59 | 58 | 24 | 2 | 601 |
| % Male | 7.0 | 4.2 | 4.5 | 6.2 | 8.7 | 8.7 | 10.0 | 9.3 | 9.0 | 8.8 | 9.8 | 9.7 | 4.0 | 0.3 | |

| 2000 | A1 | A2 | B1 | B2 | B3 | C1 | C2 | C3 | D1 | D2 | D3 | E | F | NG | TOTAL |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|--------------|
| Total | 41 | 58 | 69 | 66 | 83 | 61 | 70 | 70 | 53 | 57 | 56 | 68 | 27 | 7 | 786 |
| %Total | 5.2 | 7.4 | 8.8 | 8.4 | 10.6 | 7.8 | 8.9 | 8.9 | 6.7 | 7.3 | 7.1 | 8.7 | 3.4 | 0.9 | |
| Total Female | 26 | 36 | 38 | 29 | 34 | 19 | 24 | 15 | 19 | 14 | 9 | 13 | 3 | 0 | 279 |
| % Female | 9.3 | 12.9 | 13.6 | 10.4 | 12.2 | 6.8 | 8.6 | 5.4 | 6.8 | 5.0 | 3.2 | 4.7 | 1.1 | 0.0 | |
| Total Male | 15 | 22 | 31 | 37 | 49 | 42 | 46 | 55 | 34 | 43 | 47 | 55 | 24 | 7 | 507 |
| % Male | 3.0 | 4.3 | 6.1 | 7.3 | 9.7 | 8.3 | 9.1 | 10.8 | 6.7 | 8.5 | 9.3 | 10.8 | 4.7 | 1.4 | |

| 2001 | A1 | A2 | B1 | B2 | B3 | C1 | C2 | C3 | D1 | D2 | D3 | E | F | NG | TOTAL |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|--------------|
| Total | 40 | 46 | 56 | 65 | 84 | 63 | 62 | 73 | 53 | 50 | 69 | 55 | 30 | 9 | 755 |
| %Total | 5.3 | 6.1 | 7.4 | 8.6 | 11.1 | 8.3 | 8.2 | 9.7 | 7.0 | 6.6 | 9.1 | 7.3 | 4.0 | 1.2 | |
| Total Female | 26 | 18 | 26 | 28 | 33 | 27 | 19 | 20 | 18 | 13 | 17 | 14 | 5 | 1 | 265 |
| % Female | 9.8 | 6.8 | 9.8 | 10.6 | 12.5 | 10.2 | 7.2 | 7.5 | 6.8 | 4.9 | 6.4 | 5.3 | 1.9 | 0.4 | |
| Total Male | 14 | 28 | 30 | 37 | 51 | 36 | 43 | 53 | 35 | 37 | 52 | 41 | 25 | 8 | 490 |
| % Male | 2.9 | 5.7 | 6.1 | 7.6 | 10.4 | 7.3 | 8.8 | 10.8 | 7.1 | 7.6 | 10.6 | 8.4 | 5.1 | 1.6 | |

Physics and Chemistry Ordinary Level

Table A2 Grade distributions in Physics and Chemistry Ordinary level for years 1999-2001

| 1999 | A1 | A2 | B1 | B2 | B3 | C1 | C2 | C3 | D1 | D2 | D3 | E | F | NG | Total |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|--------------|
| Total | 0 | 4 | 5 | 15 | 25 | 17 | 26 | 42 | 25 | 37 | 63 | 72 | 51 | 30 | 412 |
| %Total | 0.0 | 1.0 | 1.2 | 3.6 | 6.1 | 4.1 | 6.3 | 10.2 | 6.1 | 9.0 | 15.3 | 17.5 | 12.4 | 7.3 | |
| Total Female | 0 | 1 | 0 | 5 | 6 | 4 | 5 | 9 | 5 | 7 | 8 | 6 | 8 | 3 | 67 |
| % Female | 0.0 | 1.5 | 0.0 | 7.5 | 9.0 | 6.0 | 7.5 | 13.4 | 7.5 | 10.4 | 11.9 | 9.0 | 11.9 | 4.5 | |
| Total Male | 0 | 3 | 5 | 10 | 19 | 13 | 21 | 33 | 20 | 30 | 55 | 66 | 43 | 27 | 345 |
| % Male | 0.0 | 0.9 | 1.4 | 2.9 | 5.5 | 3.8 | 6.1 | 9.6 | 5.8 | 8.7 | 15.9 | 19.1 | 12.5 | 7.8 | |

| 2000 | A1 | A2 | B1 | B2 | B3 | C1 | C2 | C3 | D1 | D2 | D3 | E | F | NG | Total |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|--------------|
| Total | 7 | 4 | 3 | 10 | 14 | 6 | 26 | 31 | 13 | 20 | 34 | 47 | 38 | 14 | 267 |
| %Total | 2.6 | 1.5 | 1.1 | 3.7 | 5.2 | 2.2 | 9.7 | 11.6 | 4.9 | 7.5 | 12.7 | 17.6 | 14.2 | 5.2 | |
| Total Female | 5 | 2 | 0 | 2 | 2 | 3 | 5 | 6 | 2 | 4 | 5 | 3 | 1 | 1 | 41 |
| % Female | 12.2 | 4.9 | 0.0 | 4.9 | 4.9 | 7.3 | 12.2 | 14.6 | 4.9 | 9.8 | 12.2 | 7.3 | 2.4 | 2.4 | |
| Total Male | 2 | 2 | 3 | 8 | 12 | 3 | 21 | 25 | 11 | 16 | 29 | 44 | 37 | 13 | 226 |
| % Male | 0.9 | 0.9 | 1.3 | 3.5 | 5.3 | 1.3 | 9.3 | 11.1 | 4.9 | 7.1 | 12.8 | 19.5 | 16.4 | 5.8 | |

| 2001 | A1 | A2 | B1 | B2 | B3 | C1 | C2 | C3 | D1 | D2 | D3 | E | F | NG | Total |
|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|----------|-----------|--------------|
| Total | 3 | 3 | 4 | 9 | 17 | 12 | 25 | 27 | 29 | 15 | 30 | 46 | 39 | 10 | 269 |
| %Total | 1.1 | 1.1 | 1.5 | 3.3 | 6.3 | 4.5 | 9.3 | 10.0 | 10.8 | 5.6 | 11.2 | 17.1 | 14.5 | 3.7 | |
| Total Female | 1 | 0 | 0 | 1 | 4 | 3 | 6 | 2 | 7 | 1 | 7 | 4 | 3 | 0 | 39 |
| % Female | 2.6 | 0.0 | 0.0 | 2.6 | 10.3 | 7.7 | 15.4 | 5.1 | 17.9 | 2.6 | 17.9 | 10.3 | 7.7 | 0.0 | |
| Total Male | 2 | 3 | 4 | 8 | 13 | 9 | 19 | 25 | 23 | 14 | 23 | 42 | 36 | 10 | 230 |
| % Male | 0.9 | 1.3 | 1.7 | 3.5 | 5.7 | 3.9 | 8.3 | 10.9 | 6.1 | 6.1 | 10.0 | 18.3 | 15.7 | 4.3 | |