

Summary of Examiner's Reports for NST maths IA and IB, 2011

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1 NST maths IA

This is the fifth year of the format which includes section A on each paper comprising 10 short questions to test skills and carrying 20 marks; section A1 (on paper 1) tests school-based skills and section A2 (on paper 2) tests skills acquired at Cambridge. The following section each consists of 10 questions, two of which are starred requiring knowledge of B-course material. There were 436 (420 in 2010) NST students and 70 (63 in 2010) CST students taking the exam. The raw mark available from the exam is 240 plus 20 from the new computing course taught this year for the first time by NST departments in rotation (Earth Sciences in 2010/11).

As in previous years, it was gratifying that no reports of misconduct were received. The sorting was undertaken by the Board of Exams which is complimented on the speed and accuracy with which the task was done. However, Increasingly more candidates are taking the exams in college (43 with 258 bundled questions) and this is thought to be too many and creates great strain on the system. This issue has been discussed at the NST Management Committee for all NST subjects where it is perceived as a problem.

This year, for the first time, assessors under the guidance of the Examiners were used for section A questions. This was a great success and reduced examining load on the Examiners by about 25%.

Raw marks were input by each examiner into a personalized spreadsheet and data from master cover sheets were entered into another spreadsheet which was used to check final amalgamated markbook. Only a few discrepancies were found which were corrected. The task of entering the data from master cover sheets was automated by using machine-readable master cover sheets. There were some errors which were quickly corrected, but 71 master cover sheets had no questions recorded on them which is far too large and increases the chance of error; this is far too many. The computer officers concerned, Mr Sutton, Mr Mortimer and Dr. Rose, should be congratulated.

The median mark was 170/240 compared with 162 in 2010, 140 in 2009, 131 in 2008 and 137 in 2007. This clearly corrects the trend towards lower scores and is evidence that the Examiners have responded to the belief that questions were getting harder over the years and is to be welcomed; the median marks on both papers was over 80. There was a range of popularity amongst the questions, more so on paper 1 than paper 2

It should be noted that some questions on Paper 1, numbers 12 and 14, were poorly done correlated with relatively few attempts (13 and 96). On Paper 2 questions 11 and 12 were the least well done but a moderate number of attempts (129 and 189). For a number of questions there were circa 400 attempts. This clearly puts a disproportionate load on the examiner for these questions. It should be noted that the report miscounts

the number of questions with fewer than 100 attempts on Papers 1 at four rather than the two mentioned above; this is a typo simply. The report makes the comment that the starred questions ... were relatively unpopular". This misses the points that (a) these can only be attempted by B-course candidates and (b) they are generally somewhat more sophisticated and (c) given the upper limit of five attempts, a B-course candidate is more likely to hand in the best five which are more likely to be from the first 8, joint, questions.

Concerning the section A questions, I note that the scores on A1 were significantly lower than previous years. On section A1 the mean score was 11.9/20 (14.9/20 in 2010, 14.17/20 in 2009, 11.1/20 in 2008) and on section A2 it was 16.0/20 (16.6/20 in 2010, 14.83/20 in 2009, 12.9/20 in 2008). The report does not comment on the drop in the A1 mark; however, the A2 mark is steady at a good value. Again as I commented last year and the year before, I was surprised by the statement on page 3 that both sections A1 and A2 were designed to test exclusively core A-level mathematics; it may be that the writer of the report copied these lines from last year. My understanding is stated in my first paragraph above that A2 is to test core knowledge learned in the Cambridge course. This should be clarified again; it **was** clarified with the Examiners this year and inspection of the A2 questions shows that they were correctly set. I later checked with the Senior Examiner that this is indeed a mis-statement. In summary, the A2 section mark shows that we are teaching core material successfully.

There are six important points raised by the report and also by the examiners:

- (1) The role of sections A1 and A2 should be clarified again.
- (2) Calculators were not permitted in the IA exam and there was no evidence of any resulting problem, except that several CST students were unaware of this restriction. The Examiners make a recommendation to make this clearer especially to CST students. For example, make the rubric clear that calculators are not permitted.
- (3) The use of assessors for the A sections should continue.
- (4) As in former years the Examiners felt that the marking load is too high. There are three issues. The first is that the load is so high that if one examiner were ill or unable to continue then the exam would be compromised. The second point is that it was recommended that there be an examiner from the Computer Laboratory since, in any case, it is felt to be good practice that the UCL has input to the setting and conduct of the exam. This would increase the number of examiners from 6 to 7 thus alleviating the load. The last point is the timing of the exam and the time allowed for marking; there are only 4.5 days from receipt of scripts to delivery of marks with some examiners marking over 800 questions. It may not be possible to schedule the exams earlier but it would help were this possible; for example, interchanging with the IB maths exam.

I suggested last year that the Computer Laboratory provides one examiner (70 CST out of 436 students is 1:7). I believe that in 2010/11 such a request was not successful.

The alternative would be to appoint an assessor to help mark the Section B questions, especially for those examiners with abnormally high load. For some the time allowed was simply much too little causing deadlines to be missed and possible difficulty in quality control monitoring of marking. This is an urgent issue.

- (5) Every effort should be made to reduce number of students taking the exam in the colleges. The short time scale and the large number of scripts to be redistributed in the loose system that prevails is likely to lead to errors. This is an issue that has been raised in a general context at the NST Management Committee.
- (6) Send advice to invigilators and DoSs that master cover sheets must be properly filled in and that answers should be written on one side only.

2 NST maths IB

The number of students taking the exam is was 166. There was one minor typographical error in the exam which was oddly not flagged by students at the time but remarked upon later; it was decided that it had no consequences.

Over 10 students filled out the (machine readable) cover sheets inaccurately despite clear instructions and many students wrote on both sides of the script. It is recommended that the correct procedure is clear reiterated at the beginning of the exam.

As last year machine-readable master cover sheets were used and were successful.

The Examiners were happy with the original mark scheme and the scores across nearly all questions was even and of a good standard in my view. There were a few harder questions but on the whole the standard of questions was even across subjects. The average mark across both papers was 65% while the top (raw) mark was 83%. After simple linear scaling, the 'R' value (number scoring above 60'C' value (a prediction based on earlier performance) of 72% was within the 2% limit and so no further scaling was applied.