

Department of Physics
Instructions for Examiners in all Four Years of the NST Tripos Examinations in
Experimental and Theoretical Physics

The Department of Physics issues these guidelines to examiners in order to formalise the procedure for the setting, marking and moderation of examination papers. Examiners should note that it has been established that the University Education Committee, Faculty Boards and other appropriate bodies may issue instructions to Examiners. The Faculty Board of Physics and Chemistry has delegated this power to Heads of Department working through Departmental Teaching Committees. The Teaching Committee has in mind the fact that we have to maintain factual evidence of our examination procedures to support the new QAA Institutional Audits, and any QAA Subject Review which we may undergo in the future. It also views the present instructions as positive clarification, which will help improve the standards of our examinations

Senior Examiner's duties and retention of records

Senior Examiners are responsible for the organisation of the examination process, and must satisfy themselves that the instructions in this document have been followed. They should maintain two ring binders, one of informal advice on how to run the examination, and one of formal records. The latter **must** include i) minutes of examiners' meetings, in which significant decisions are recorded, ii) the examination papers as taken by the candidates, iii) complete sets of model answers for all questions, iv) any reports from markers and moderators on the marking procedures, v) correspondence about individual candidates, vi) any reports from the External Examiners, and vi) the Examiners' report on the examination for the Department. They should also include any other records of correspondence etc which need to be retained for record purposes. The two ring binders must be returned to the Head of Department after the Examination. Senior Examiners should also communicate promptly to the Teaching Committee any changes which may be necessary for the following year, especially any which will require a Form and Conduct notice. The examination scripts themselves will normally be retained for four months, but sample scripts will be retained for longer.

Setting of papers and preparation of model answers and mark scheme

The Examiners are responsible for the setting of the paper and the conduct and marking of the examination. In Parts I and II, the lecturers should assist the examiners in preparing draft questions and outline solutions. The examiner responsible for a question, the setter, **must** provide model answers, which will enable other examiners to obtain a better appreciation of whether or not the question is fair and of the appropriate length. Setters **must** also prepare a mark scheme for each part of the question; in preparing it, they should be aware of the general advice on answering questions of different types given to students in the Course Handbook. In Part III, questions are provided by the lecturers for the Major and Minor options and these are moderated by the examiners. For all examinations, the final versions of the model answers with the mark scheme should be sent to the external examiners with the draft papers. Before any paper is finalised, it should be read by someone not previously involved in its preparation.

First marking of papers

Marks corresponding to the marking scheme should be entered on the script. If bonus marks are awarded they should be distinguished in some way. It is good practice to put a tick mark on each page examined. The sum of the marks for each question should appear ringed at the end of the answer and also written on the cover sheet. It should not normally be necessary to alter the

agreed mark scheme, but in exceptional cases the first marker must agree any proposed changes with the second marker, and the Senior Examiner should agree any significant alteration. The first marker should write a short report on the marking and the students' responses, and give it to the Senior Examiner for use in the Examiners' Report.

Marks on scripts

In connection with the Data Protection Act, the University Education Committee has issued general advice to examiners that no marks at all should be made on scripts. However, it has been agreed by the NST Management Committee that this is not realistic in science examinations, and would make second marking less effective. The Education Committee has been informed that in physics examinations numerical marks will be written on the papers as described above, and that in addition other brief marks may be used, for instance, to indicate action taken when the candidate has not obeyed the rubric, or has given two versions of an answer, or has presented the answer in the wrong sequence. Marks or words may also be used to show where or how an algebraic or numerical answer has broken down (e.g. 'dimensions wrong' or 'needs next order of approximation'), to indicate why a qualitative comment is considered incorrect, or to explain briefly why bonus marks have been awarded. Examiners should however remember that anything written on a script might have to be communicated to the candidate in cases of dispute, and might therefore have to be defended in court.

Sample second marking

The Department has adopted a procedure of sample second marking to ensure that the marking scheme is fair and has been uniformly applied. For the numbers of candidates in most physics examinations, this requires detailed remarking of about 10 per cent of the scripts. When there are fewer than 50 candidates, most second markers will feel the need to increase this percentage. The second marker should discuss any problem with the mark scheme with the first marker and agree a course of action. If the problem is significant, or the markers cannot agree, the matter must be referred to the Senior Examiner. It is the responsibility of the second marker to check the addition of all marks. This must be done for all of the scripts, not just a sample of them. All corrections should be checked and agreed with the First Marker.

Marking of questions in excess of the number requested

When candidates submit attempts at more questions from any particular section than specified by the rubric, all questions should be marked. The best marks consistent with the rubric should be used in determining the overall mark for the Paper.

Moderation of practical marks and further work

The Head of Department is formally responsible for providing examiners with marks for all assessed coursework; in practice these marks reach examiners through Heads of Class, Departmental Examiners and the organisers of further work. In Parts IA and IB the coursework consists of Practicals. In Part II there is Long Vacation Work, the Computing Project, E1, E2, TP1, TP2, the Literature Review, Physics Education and Physics in Action. In Part III there are the Major and Minor Options, the Long Vacation Work and the Project. All marks for assessed work should be moderated by one of the examiners, who will review them for consistency between different Heads of Class and Assessors of Literature Reviews, Physics Education and Projects. The moderating procedure normally adopted for each unit of further work should be recorded in the examination ring binder. The moderator should write a short report and give it to the Senior Examiner for filing.

Use of computers and e-mails and the checking of mark transfers and additions

For security reasons, details of questions, draft papers and marks should never be communicated by e-mail, nor should they be stored on machines connected to the Web. Great care should be taken when marks are transferred from one spreadsheet to another. Where possible, a protocol should be used which matches the student numbers on both spread-sheets (Professor Gull can advise). In any case, a careful check must always be made by both the marker and the second marker that the marks entered are correct, that marks have not been allocated to the wrong candidate, that candidates have answered the right number of questions, and that no marks have been omitted. Where spreadsheets sum or scale marks automatically, checks should be made that the calculation is correct. Examination material may only be retained on computer or disc for a declared good reason, and must be registered under the Data Protection Act. All other material must be deleted within four months of the examination; Senior Examiners should check that this has been done.

Classing

Examiners in Part I will be expected in general to adhere to whatever classing scheme the Chairman of Examiners has promulgated. In Part II and Part III examiners should be guided by the Department Classing Criteria (which are reproduced in the Course Handbook), by the views of the External Examiners and by the behaviour of their predecessors as well as by their own sense of what is just. The Strategic Committee for NST has recently urged them in addition to pay close attention to the cohort tracking data. This is necessary in order to maintain fairness between the different subjects in Part II and Part III Natural Sciences. The Teaching Committee regards sudden large changes in classing policy as rarely justified.

Candidate anonymity

Candidate anonymity is preserved by the use of candidate numbers. For Departmental examinations the candidate numbers are not always available in time, and locally generated numbers may be used instead. For practicals and other types of further work, the work cannot be marked blind, but the assessors' reports and cover sheets should not reveal the candidate's identity, and moderators should not be aware of it. Where a warning letter has been received, the Senior Examiner may have to know the candidate's identity, but should not reveal it to other examiners. Anonymity must not be broken until classing is complete.

Candidates under a disadvantage

Candidates taking Tripos papers do so under the usual University rules -- in general, the Senior Examiner will know when a warning letter has been received, but the examiners will be expected to class the candidate if possible on the basis of the work submitted. Where candidates have taken coursework under a disadvantage, an application should have been made by the college to the Applications Committee. Unless an allowance is authorised by the Applications Committee, no mark adjustments can be made.

Malcolm Longair, 22 June 2004.

Revised Rachael Padman, 6 February 2010