Department of Mathematics: Examination Conventions 2019–20

Final Honour Schools of Mathematics – Part A

1 Introduction

This document sets out the examination conventions for the **Part A Examination** in Mathematics. Examination conventions are the formal record of the specific assessment standards for the course or courses to which they apply. The first part of this document is written explicitly for candidates and explains how your work will be marked and how these marks will be used to derive your final classification for Parts A and B. The second part of the document contains additional information for assessors and examiners but some will also be of interest to candidates. So if you want to know what criteria are used in deciding the marking scheme for each examination question, then see appendix F. The qualitative class descriptors tell you what is level of performance is required in order to get a particular class and can be found in appendix M. You might also find the checklist used by question setters useful, see appendix D, and the note about the recalibration of marks, see appendix K.

The Mathematics Teaching Committee directs that the Part A Examination be in accordance with these conventions. The Board of Examiners may only make minor deviations from these conventions in exceptional circumstances and only after the consent of the Mathematics Teaching Committee or the Proctors. This document is in all ways subsidiary to the current:

- *Examination Regulations,*
- *Examinations and Assessments Framework.*

2 Progression through University Examinations

To qualify for your BA or MMath in Mathematics you must pass a First and Second Public Examination. The First Public Examination in Mathematics is currently called the Preliminary Examination in Mathematics and is taken at the end of the first year. You must pass the Preliminary Examination before you can be admitted to the Second Public Examination.

The Second Public Examination has three parts: Part A taken at the end of the second year, Part B taken at the end of the third year and Part C taken at the end of the fourth year. You cannot enter for Part B until you have completed the Part A exams [1], and only candidates who obtain an upper second class or higher in the combined classification of Parts A & B, together with a weighted Part B average of 59.5 or higher, qualify to proceed to Part C. Candidates who satisfy the examiners in Part A and Part B only, qualify for the award of BA in Mathematics; candidates who satisfy the examiners for all three parts qualify for the award of MMath in Mathematics with two associated classifications.

[1] Completing Part A means that you have sat all of the Part A exams and have not technically failed two or more papers. See 4.1 for an explanation of technical failure.

3 Part A Examination Papers

In Part A, there are three core papers A0, A1 and A2, nine papers A3-A11 relating to the long options and paper ASO relating to the short options. Mathematics papers will be assessed by an open book exam and the examinations will be administered via WebLearn. Paper A2 is of 4 hours' duration, whilst the remaining papers are of 2 hours' duration. Of this time you should spend 1 hour and 30 minutes on the examination (with the exception of A2 where 3 hours of this time will be spent completing the examination) and the remaining time on downloading the exam paper and then scanning your handwritten solutions and uploading them at the end.

In all papers, each question is worth 25 marks and candidates may submit answers to as many questions as they wish. Details are given below of which questions count towards a candidate's total mark.

Candidates are required to offer Papers A0, A1, A2 and ASO and *five or six* of Papers A3-A11.

Paper A0 Linear Algebra and A1 Differential Equations 1

These are core papers; each paper contains three questions with the best two questions counting towards a candidate's total mark for the paper.

Paper A2 Metric Spaces and Complex Analysis

This core paper includes six questions. The best four questions count towards a candidate's total mark for the paper.

The Long Options Papers A3-A11 examine the long options as below:

- A3 Rings and Modules
- A4 Integration
- A5 Topology
- A6 Differential Equations 2
- A7 Numerical Analysis
- A8 Probability
- A9 Statistics
- A10 Fluids and Waves
- A11 Quantum Theory

Each paper contains three questions with the best two questions counting towards a candidate's total mark for the paper.

If a candidate offers 5 long options then each paper's USM (see Section 6) will count as a single unit towards the candidate's weighted Part A average.

If a candidate offers 6 long options, then the best 4 USMs will have the weight of a unit, and the worst 2 USMs will count half a unit each. Thus these 6 papers will overall still have the weight of 5 units. The results from all 6 papers will appear on the student's exam transcript.

The aim of the above scoring system is to ensure that anyone taking on an extra option will not do so lightly (all marks will be reported and all count to some extent), but also that no-one will be disadvantaged with a lower weighted average USM for having taken on the extra workload.

Paper ASO Short Options This paper contains a single question on each of the short options below:

- Number Theory,
- Group Theory,
- Projective Geometry,
- Introduction to Manifolds,
- Integral Transforms,
- Calculus of Variations,
- Graph Theory,
- Special Relativity,
- Mathematical Modelling in Biology.

The best two questions count towards a candidate's total mark for the paper.

In all papers each question will be marked out of 25 and should be divided into two to four parts. An indication of the raw marks available for each part of each question should be given on the question paper.

4 Examination Conduct

You will receive advice from the examiners before each part of your finals examination. These notices provide information on the conduct of the examinations including details of open book exams and how to complete and submit scripts. Notices from examiners from previous years can be found on the Mathematical Institute's website.

4.1 Penalties for Non-attendance

Rules governing non-attendance at examinations and any consequent penalties are set out in full in the Examination Regulations (Regulations for the Conduct of University Examinations, Part 14). If you miss an exam, you will be expected to provide a statement to your college explaining the reason you were not able to attempt the open-book exam within 48 hours of the start of that open-book exam. You are not expected to provide medical evidence. Colleges should apply with this information using the standard process.

In cases where the Proctors do not believe there are satisfactory reasons for non-attendance or an application to the Proctors has not been submitted, this will result in the technical failure of that exam paper. The examiners will award a mark of 0 for that paper. A student with a technical fail on one paper may enter to resit that paper on at most one subsequent occasion, at the time of taking their Part B examinations. The University Standardised Mark for the resit of the exam paper will be capped at 40. A student with a technical fail on two or more papers will be considered not to have completed Part A and will have to resit all of the Part A exam papers before proceeding to Part B. The marks of a student resitting all papers will not be capped.

Table 1: Late Submission Tariff for Open Book Exams.

Lateness	Penalty
First 15 minutes	No penalty
16–30 minutes	5% of marks
31–45 minutes	10% of marks
46 minutes to 1 hour	15% of marks
Over 1 hour late	Fail (0 marks awarded)

4.2 Penalties for Late Submission of Open Book Examination Solutions

Penalties will be applied if you do not submit your solutions to the open book examinations by the stipulated deadline. These penalties are set out in Table 1 below.

Note: The penalty will be a percentage reduction in the USM available for the paper. Since all papers are awarded USMs out of 100, a submission, for example, 20 minutes late would mean the final mark awarded would be the scaled USM reduced by 5 marks.

5 Marking of Mathematics Examinations

All mathematics examinations are marked by a single assessor or examiner according to a pre-agreed mark scheme which is strictly adhered to. The examination scripts are then checked by an independent checker to ensure that all work has been marked, and that the marks have been correctly totalled and recorded. Please see Appendix F for the qualitative descriptors of the bands of marks awarded to examination answers.

6 University Standardised Marks

Although the Part A Examination is an unclassified examination, marks for each individual examination paper will be reported as University Standardised Marks (USMs). The object of the USMs is to allow direct comparison between the results of examination in different subjects. Raw marks may be turned into USMs by scaling, sometimes necessary to ensure that all papers are fairly and equally rewarded. The correspondence between the USM ranges and classes is as follows:

- 70-100: First Class
- 60-69: Upper Second Class
- 50-59: Lower Second Class
- 40-49: Third Class
- 30-39: Pass
- 0-29: Fail

These marks reflect the qualitative descriptors given in Appendix M.

7 Analysis of marks

7.1 Part A

At the end of the Part A examination, a candidate will be awarded a University Standardised Mark (USM) for each of the papers offered. The Examiners may scale the raw marks to arrive at the USMs reported to candidates.

The scaling algorithm used by the mathematics examiners is explained in detail in the 2019 examiners' report which can be found at `https://www.maths.ox.ac.uk/members/students/undergraduate-courses/examinations-assessments/examiners-reports`.

The examiners may choose to scale marks where in their academic judgement:

- a paper was more difficult or easier than in previous years, and/or
- an optional paper was more or less difficult than other optional papers taken by students in a particular year, and/or
- a paper has generated a spread of marks which are not a fair reflection of student performance on the University's standard scale for the expression of agreed final marks, i.e. the marks do not reflect the qualitative marks descriptors.

Such scaling is used to ensure that all papers are fairly and equally rewarded. When scaling the raw marks on a paper the examiners will consider the following:

- the total sum of the marks for all questions on the paper, subject to the rules above on numbers of questions answered;
- the relative difficulty of the paper compared to the other Part A papers;
- the report submitted by the assessor who set and marked the paper.

Examiners will use their academic judgement to ensure that appropriate USMs are awarded and may use further statistics to check that the marks assigned fairly reflect the students' performances on a paper. Examiners may also review a sample of papers either side of the classification borderlines to ensure that the outcome of scaling is consistent with the qualitative marks descriptors.

The USMs awarded to a candidate for the papers offered in Part A will be carried forward into a classification as described below. Paper A2 will have twice the weight of Papers A0, A1, A3-A11 and ASO in this calculation. For candidates who have opted to offer 6 long options (papers A3–A11), the two lowest scoring long option papers will be given a weight of 0.5. **Part A is not classified separately**.

7.2 Aggregation of marks for the award of the classification on the successful completion of Parts A and B

All successful candidates will be awarded a classification after the Part B examination. This classification will be based on the following rules (agreed by the Mathematics Teaching Committee) which include a *Strong Paper Rule*.

Every candidate must offer

- 10 units at Part A (counting A2 as a double-unit and, for candidates offering 6 long options, two of the long options papers as half units)
- 8 units (or equivalent) at Part B.

The relative weightings of the Parts is as follows:

- The weighting of Part A is 40%.
- The weighting of Part B is 60%.

Strong Paper Rule

A candidate will have satisfied the First Class, resp., Upper Second Class, resp., Lower Second Class strong paper rule if at least 6 units from Parts A and B lie in that class (or better) and include at least 2 of them in Part B.

To give an example, a candidate will have satisfied the Upper Second Class strong paper rule if the USMs of at least (the equivalent of) 6 units are at least Upper Second Class marks with (the equivalent of) at least 2 Upper Second Class units at Part B level.

In the following $Av\ USM = Average\ weighted\ USM\ for\ Parts\ A\ and\ B\ together$ (symmetrically rounded [62.49 will be rounded down and 62.50 will be rounded up]);

- First Class: $Av\ USM \geqslant 70$ and the First Class Strong Paper Rule satisfied.
- Upper Second Class: $Av\ USM \geqslant 70$ and the First Class Strong Paper Rule not satisfied **OR** $70 > Av\ USM \geqslant 60$ and the Upper Second Class Strong Paper Rule satisfied.
- Lower Second Class: $70 > Av\ USM \geqslant 60$ and the Upper Second Class Strong Paper Rule not satisfied **OR** $60 > Av\ USM \geqslant 50$ and the Lower Second Class Strong Paper Rule satisfied.
- Third Class: $60 > Av\ USM \geqslant 50$ and the Lower Second Class Strong Paper Rule not satisfied **OR** $50 > Av\ USM \geqslant 40$.
- Pass: $40 > Av\ USM \geqslant 30$.
- Fail: $Av\ USM < 30$.

BA in Mathematics

Any candidate who satisfies the examiners for Parts A and B (and who does not subsequently enter for and achieve Honours for Part C) may supplicate for the Honours degree of the Bachelor of Arts in Mathematics with the classification as described above, provided that they have fulfilled all the conditions for admission to a degree of the University.

MMath in Mathematics

In order to proceed to Part C, a candidate must achieve an upper second class standard or better in their second and third year exams and a weighted average of 59.5 or above for their third year exams.

Candidates successfully completing Part C will receive a separate classification based on their University Standardised Marks in Part C papers.

Note that successful candidates may only supplicate for one degree – either a BA or an MMath. The MMath has two classifications associated with it but a successful candidate will only be awarded an MMath degree.

8 Resits

Part A shall be taken on one occasion only (there will be no resits).

9 Alternative Examination Arrangements and Mitigating Circumstances Notices to Examiners

A candidate in any University Examination with specific learning difficulties or disability/illness may apply through the Senior Tutor of their college for alternative examination arrangements relating to their condition. Please see `http://www.ox.ac.uk/students/academic/exams/arrangements` for further information on the process.

Candidates who would like the examiners to be aware of any mitigating circumstances that may have affected their performance before or during an examination are advised to discuss their circumstances with their college and consult the Examination Regulations (Part 13). The candidate's college will submit the Mitigating Circumstances Notice to Examiners for forwarding to the relevant chair of examiners.

Where a candidate or candidates have made a submission, under Part 13 of the Examination Regulations, that unforeseen circumstances may have had an impact on their performance in an examination, a subset of the board will meet to discuss the individual applications and band the seriousness of each application on a scale of 1–3 with 1 indicating minor impact, 2 indicating moderate impact, and 3 indicating very serious impact. When reaching this decision, examiners will take into consideration the severity and relevance of the circumstances, and the strength of the evidence. Examiners will also note whether all or a subset of papers were affected, being aware that it is possible for circumstances to have different levels of impact on different papers. The banding information will be used at the final board of examiners to adjudicate on the merits of candidates. Further information on the procedure is provided in the *Examinations and Assessment Framework, Annexe E* and information for students is provided at `www.ox.ac.uk/students/academic/exams/guidance`.

10 Plagiarism

You are reminded of the importance of avoiding any plagiarism, please see `http://www.ox.ac.uk/students/academic/guidance/skills/plagiarism` for further guidance. Depending on their severity, cases of suspected plagiarism may be referred to the Proctors for investigation or may be dealt with by the board of examiners. If dealt with by the board of examiners as a case of poor academic practice, the examiners may deduct marks (for lack of adequate referencing, poor use of citation conventions etc.) of up to 10% of the marks available for the assessment. Where the consequence of the marks deduction would result in both the failure of the assessment and of the programme the case must be referred to the Proctors.

When you take an exam, you will be required to sign up to an 'honour code'. This will confirm that you have understood and abided by the University's rules on plagiarism and collusion (see `https://www.ox.ac.uk/students/academic/exams/open-book/honour-code?wssl=1`).

11 Examiners for 2019–20

The internal examiners are:
Prof. Nikolay Nikolov (Chair),
Prof. Alex Scott,
Prof. Fernando Alday,
Prof. Zhongmin Qian,
Dr Neil Laws.

The external examiners are:
Prof. Demetrios Papageorgiou , Chair in Applied Maths and Mathematical Physics, Imperial Col-

lege.
Prof. Jelena Grbic, Professor of Pure Mathematics, University of Southampton.

It must be stressed that to preserve the independence of the Examiners, you should not make contact directly with them about matters relating to the content or marking of papers. Any communication must be via the Senior Tutor of your college, who will, if they deem the matter of importance, contact the Proctors. The Proctors in turn communicate with the Chair of Examiners.

Appendices

Further Information for Examiners

A Chair of Examiners

'Regulations for the conduct of examinations, Part 6', in the *Examination Regulations* covers the appointment of the Chair. The Committee for the Nomination of Examiners will usually appoint a Chair in Trinity Term of the preceding year.

B Paperwork

B.1 Internal Examiners

Internal examiners should ensure that they are equipped with the following documents which will be provided by the Maths Institute's administration, either in hard copy or in electronic copy.

- The *Examination Regulations*.
- The *Examinations and Assessment Framework*.
- The *Aims and Objectives* of the mathematics courses, as agreed by the Teaching Committee.
- The *Course Handbook* and the *Lecture Synopses*.
- The examination papers from the preceding two years.
- The Examiners' Reports on these examinations.
- The External Examiners' reports for the previous year.
- Any responses to these agreed by the Teaching Committee on behalf of the Faculty, and any additional decisions of the Teaching Committee.
- Reports to the Teaching Committee on individual papers where appropriate.
- The published tables of *Class Percentage Figures* for the last two years (as published in the Examiners' Reports) and following guidelines from the Education Committee and the Mathematics Teaching Committee.

When there are new examinations, material from previous years will not be directly applicable, but there may be specimen examination papers produced by the Teaching Committee.

The Director of Undergraduate Studies will ensure that the external examiner is (where appropriate) also provided with copies of these documents.

C Form of Questions

Each question will be marked out of 25 and should be divided into two to four parts. An indication of the raw marks available for each part of each question should be given on the question paper.

D Checklist for Setters and Checkers

The examiners should provide those who are asked to supply draft questions with a checklist of important considerations.

1. Is the question on the syllabus (as in the Examination Regulations or Course Handbook including the Lecture Synopses)?
2. Is the mathematics correct?
3. Is the notation and terminology standard/obvious/defined? (Standard usage from the course is acceptable without explanation but phrases such as 'as in the lectures' should be avoided.)
4. Is the question unambiguous? Is it clear what may be assumed, what detail is required, and what would constitute a complete answer?
5. Is the form of presentation familiar/inviting/readable?
6. Does each question have an easy start, consisting of some standard bookwork or similar material, worth around 10 marks which might be readily and routinely completed? This should not wholly be testing memory of previous material explicitly seen.
7. Is there material designed to differentiate at the class borderlines.
   (a) For the II(i)/II(ii) borderline is there a part that tests understanding of standard concepts/techniques (whilst still being rather straightforward) which tests whether a candidate can do any more than merely memorise the bookwork?
   (b) For the I/II(i) borderline is there a part for which a full solution requires truly excellent understanding and skill?
8. Would a II(i)/II(ii) borderline candidate on average achieve around 13/25 marks for the question? Is a mark of 20+ unlikely to be achieved by a significant number of candidates who are not of first-class standard?
9. Is it the case that only exceptional first-class students are capable of gaining full marks?
10. Is each question overall of a straightforward character?
11. Are the questions as a whole fairly spread across the syllabus?
12. Are the questions of comparable difficulty to one another?
13. Are the questions sufficiently different from those set in recent years?
14. Is the question formatted using the oxmathexam.cls file?
15. Does the question, adequately spaced, fit on a single page?

As students will be sitting these papers at the end of the second year of their studies, questions should be significantly more straightforward than those set for Part B.

E Protocols

- For Papers A0, A1 and A2, the questions should be set by one examiner and checked by another, or an assessor. The final drafts of papers must be reviewed and approved by the whole Examining Board.

- After the Michaelmas Term lecture courses have finished for A0, A1 and A2 course lecturers are invited to comment on the papers.
- For Papers A3-A11 and ASO, questions should be drafted by the appropriate lecturer and checked by the examiners (or assessors if the examiners do not possess appropriate expertise). The final drafts of papers must be reviewed and approved by the Examining Board. The expectation is that scripts will be marked by the appropriate lecturer.
- Letters to course lecturers from previous years are commended as good practice.
- Examiners are reminded of the need for security when dealing with examination papers. All papers must be passed via the Academic Administration Office either in person, by hand or via the secure Weblearn site only.

F Marking Schemes

F.1 Model Solutions

Those setting questions are asked to provide **complete model solutions** worthy of full marks, carefully annotated so as to indicate what is considered bookwork, what has been seen before on problem sheets and what is considered to be new and unseen, and with a draft marking scheme for the approval of the examiners; the solution, with additional comments, should also make clear how much of the question is accessible to less strong candidates.

F.2 Aims of Marking Schemes

Marking schemes for the questions should aim to ensure that the following qualitative criteria hold:

20–25 marks A completely, or almost completely, correct answer, showing excellent understanding of the concepts and skill in carrying through the arguments and/or calculations; minor slips or omissions only.

13–19 marks A good though not complete answer, showing understanding of the concepts and competence in handling the arguments and/or calculations. Such an answer might consist of an excellent answer to a substantial part of the question, or a good answer to the whole question which nevertheless shows some flaws in calculation or in understanding or in both.

7–12 marks Standard material has been substantially and correctly answered with some possible minor progress on to other parts of the question.

0–6 marks Some progress has been made with elementary, accessible material.

F.3 Approval of Marking Schemes

The marking schemes are approved by the examiners alongside the papers. Minor edits may be made during the setting and checking process in consultation with the setter.

F.4 Review by External Examiners

The external examiner should be consulted according to the agreed timetable, and provided with stable draft papers; they should be provided with full annotated solutions indicating what is bookwork, and with the proposed marking scheme. Comments from the external examiner on each paper

will be sent to the relevant setters. The examiners should not finalise any paper without taking into account the comments of the external examiner. The external examiner should be kept informed of any action taken as a result of their suggestion.

G Attendance at Examinations

Attendance of Assessors will not be possible in the open-book examination. If an error is found during the examination paper, a candidate should make a note of this on the paper before submitting. This will then enable the Exam Board to take the error into consideration in the normal way.

H Marking and Checking

H.1 Marking

The examiners should provide each marker with the marking scheme approved by the Examining Board. Note that minor edits may have been made by examiners during the setting and checking process in consultation with the setter/marker. Letters to markers in previous years are commended; the following points must be made:

Marking Schemes The examiners have seen and approved the marking schemes; it is the responsibility of markers to use the approved marking scheme discarding earlier drafts. Markers should apply the schemes consistently. However, it may become clear while marking that the allocation of marks should be changed. If such a change is made, markers are asked to ensure that this done so consistently, and to inform the examiners of the change.

Mark Ranges in FHS papers In all papers questions will be marked out of 25. In A2 the best four answers will count; for the remaining papers the best two answers will count.

Marking The examiners will want to review at least some of the scripts during the classification process. They will not want to re-mark (since they cannot do so consistently across all candidates). They need to see quickly where marks have been gained. They will also want to be sure that a candidate's work has been taken into consideration. Markers are therefore asked:

- indicate on the mark sheets, using whole numbers, the available marks awarded for each part of a question.
- Include the total mark awarded for each questions in the highlighted sections of the marksheet, enter the integral numerical mark for each question, taking care to distinguish between an attempt scoring zero marks (enter "0") and a non-attempt (enter "-").
- not write comments in the questions section, but, if necessary write on the second tab of the mark sheets provided.

Mark sheets will be supplied.

In entering into the electronic mark sheets the integral numerical mark for each question care must be taken to distinguish between 0 marks for an attempt and − for a non-attempt.

Assessors are asked to compute the check-sum for each candidate, which is the last two digits of the candidate number(taken as a two digit number) plus the sum of raw marks.

Assessors will be asked to return the marksheet electronically through the marking site on weblearn.

Reports Assessors will provide the examiners with a brief report on the performance of the candidates on each paper (or part-paper) to assist them in their deliberation on calibration; in particular assessors are invited to suggest where class boundaries could be drawn. Model examples of helpful reports are available.

I Checking the Marks

The examiners should ensure that their procedures allow for:

- an independent arithmetic check of the correctness of the addition of the partial marks for each question;
- an independent check of the marks entered into the marks database for each candidate;
- an audit trail for these checks.

Graduate research students are employed to carry out such checks. The standard document 'Instructions for Graduate Checkers' is kept in the Academic Office, and gives details.

I.1 Logging Scripts

The examiners should ensure that a central log is kept of the whereabouts of all scripts; and should instruct all markers to return 'sporadic' scripts or answers to the central contact with a note of explanation.

I.2 Availability of Assessors

The Chair must ensure that those appointed as assessors are informed of the examiners' timetables, and are made aware that they must be available for consultation by the examiners until the signing of the Class List, particularly during the input and checking of the marks. Assessors must be available during the examination of their subject in case of candidate queries.

J Coursework

Not applicable at Part A.

K Recalibration of Marks

Examination marks will be reported to candidates in the form of University Standardised Marks. The object of the USM is to allow direct comparison between the results of examination in different subjects. Examiners may recalibrate raw marks to arrive at the USMs reported to candidates. On each paper, any recalibration of marks should be done without disturbing the order of candidates. In order to ensure fair treatment examiners are reminded that they may exercise individual consideration in assigning USMs for candidates whose marks lie outside the standard pattern.

Examiners should take note of the distribution of USMs above 60 and above 70 in the Examination in a normal year and not depart from it without good reason. Information about the distribution of USMs in the Examination for recent matriculation years will be provided by the Teaching Committee.

The USMs reported to candidates for each paper should be symmetrically rounded.

L Mitigating Circumstances Notice to Examiners

The University's policy on the use of medical and other certificates is available at `https://academic.admin.ox.ac.uk/files/examsandassessmentframework2019-20pdf`.

As Part A is part of a multi-part examination there are two points at which the mitigating circumstances notice should be considered, the final meeting of the Part A examiners and the final meeting of the Part B examiners.

If Part A examiners are presented with a mitigating circumstances notice affecting one paper they can take it into account and decide on appropriate action to be taken.

If Part A examiners are presented with a mitigating circumstances notice affecting more than one paper and feel unable to take any action at the Part A Examination Board they should pass this information, along with the medical or other evidence, to the Board of Examiners in Part B the following year. The Part B examiners can then take this evidence into account before making a classification. Once USMs have been issued to colleges at the end of Part A they cannot be altered, so in order to take such evidence into account Part B examiners may have to suspend the examining conventions in awarding a classification.

In all cases a record of mitigating circumstances notices and medical or other evidence submitted at Part A must be kept and passed to the Part B examiners, along with a note of the any action taken.

M Classification of Candidates

The average USM ranges used in the classifications reflect the following general **Qualitative Class Descriptors** agreed by the Teaching Committee:

First Class: the candidate shows excellent skills in reasoning, deductive logic and problem-solving. They demonstrate an excellent knowledge of the material, and can use that in unfamiliar contexts.

Upper Second Class: the candidate shows good or very good skills in reasoning, deductive logic and problem-solving. They demonstrate a good or very good knowledge of much of the material.

Lower Second Class: the candidate shows adequate basic skills in reasoning, deductive logic and problem-solving. They demonstrate a sound knowledge of much of the material.

Third Class: the candidate shows reasonable understanding of at least part of the basic material and some skills in reasoning, deductive logic and problem-solving.

Pass: the candidate shows some limited grasp of at least part of the basic material.

[Note that the aggregation rules in some circumstances allow a stronger performance on some papers to compensate for a weaker performance on others.]

Fail: little evidence of competence in the topics examined; the work is likely to show major misunderstanding and confusion, coupled with inaccurate calculations; the answers to questions attempted are likely to be fragmentary only.

N Post Examination

Examiners should ensure that the following are deposited with the Head of Academic Administration (or Undergraduate Studies Administrator), Mathematical Institute:

- a definitive record of individual USMs, signed off by one of the examiners (to be kept on file at the Institute for reference and for use in later examinations);
- all records of the Examination not otherwise destroyed and declarations relating to the destruction of examination material (as requested by the Proctors);
- full marking schemes, including any subsequent amendments;
- LaTeX source files for the papers incorporating any corrections.

Chair
on behalf of the Teaching Committee.