

Staff Guidance for Preparing Final Assessments (2022-23 Academic Year)

Arick Shao (UG SEB Chair)
Robert Johnson (PGT SEB Chair)

[Last updated: 21 November, 2022]

This document is a summary of policies on the preparation of final assessments.

Note: *Guidance on marking exams will be given in a separate document.*

(Parts of this document were extracted from previous instructions by Matt Fayers.)

Contents:

- 1. Overview**
- 2. The Scrutiny Process**
- 3. Guide for Creating QMPlus Exams**
- 4. Guide for the LaTeX Style File**

1. Overview

1.1. Scope

The guidelines in this document apply to all modules that come within the remit of the School's exam boards. These include all modules that are run internally within the school (*MTH*****).

This document also applies to mathematics modules in the Foundations programme (SEFP):

- *SEF015: Discrete Mathematics*
- *SEF026: Essential Foundation Mathematics*
- *SEF040: Mathematics A*
- *SEF041: Mathematics B*

Exams for these modules go through the same checking and scrutiny process as for *MTH* modules.

1.2. Exam types

This academic year, final exams come in a number of formats:

1. **On-campus, paper exam:** These are the traditional invigilated exams that we ran prior to the pandemic. Students sit in a room and write the exam on paper.
2. **On-campus, IT lab:** This is set up as an online exam, but students complete the exam in an invigilated on-campus IT lab.
3. **Online exam:** These are essentially the online exams that we ran the previous two years.

Since each exam format has already been approved on a per-module basis by the Faculty, *module organisers are now no longer able to change their exam format.*

For on-campus paper exams (option 1), the exam paper is set using the School's *LaTeX style file*.

For purely online exams (option 3), module organisers can choose from the following:

- a) **Handwritten exam:** This resembles traditional exams, where students submit handwritten solutions. This is implemented as a QMPlus quiz with a single question, which contains both the exam document and an area in which students can submit their solutions as a PDF file.
- b) **QMPlus quiz:** This is made from QMPlus quiz questions (multiple choice, fill-in-the-blank, etc.), which can then be automatically marked by QMPlus. One can also implement a *hybrid quiz* by adding one or more manually marked handwritten questions to the above.
- c) **External quiz:** A few modules have final exams administered by external online systems:
 - *MTH4*00: Calculus I* (via *MyLabMath*)
 - *MTH4*01: Calculus II* (via *MyLabMath*)
 - *MTH4*16: Probability and Statistics I* (via *WeBWorK*)
 - *MTH5*12: Linear Algebra I / Applied Linear Algebra* (via *WeBWorK*)

It is the module organiser's responsibility to apply these external systems correctly.

For on-campus IT lab exams (option 2), these are also set up as either a QMPlus or an external quiz (options 3b or 3c above). Moreover, the quiz *must not contain any handwritten questions*, as we will not have a way to accommodate these in an IT lab.

1.3. Exam details

After many last-minute changes from above, the timing of exams this year will be as follows:

- All level 4 exams (**online** and **in-person**) will be held over a 3-hour period.
- All level 5-7 exams (**online** and **in-person**) will be held over a 4-hour period.

Note: Several of our modules are linked to outside accreditation from the IFoA. Thus, an exception to the above is that Actuarial Sciences students who wish to qualify for an IFoA exemption must complete and submit their exam within the first 3 hours of the 4-hour period.

Note: The intention is to bring all exams down to a 2 or 3 hour period in future years.

The intended lengths of exams remains unchanged from previous years:

- **UG exams** should be designed so they can be completed within 2 hours.
- **PGT exams** vary depending on the module. Some exams should be doable in 2 hours, while others should be doable in 3 hours. (See the *PGT SEB Chair* for details for your exam.)

This year, we will also handle students with *exam access arrangements* differently:

- For **online exams** (option 3):
 - We generally do not need to grant extra time to students with exam access arrangements. (There may be a very small number of exceptions for longer PGT exams.)
 - By the university's inclusivity edict, all students take exams under the same conditions.
- For **invigilated exams** (options 1, 2):
 - We generally do not need to grant extra time to students with exam access arrangements. (There may be a very small number of exceptions for Level 4 and PGT exams.)
 - However, students with exam access arrangements will sit in a separate exam room.

Regarding access to resources for **invigilated exams**:

- For **paper exams** (option 1):
 - Level 4 modules (*MTH4****) have closed-book exams.
 - Level 5-7 (*MTH5****, *MTH6****, *MTH7****) modules have partially open-book exams, in which students are allowed to bring 3 pages of A4 paper to the exam.
- For **IT lab exams** (option 2):
 - Online notes are generally allowed (though there can be some variation on this).
 - Online communications (e.g. chat room, forum) are not allowed.
 - Students cannot bring physical tools to the exam (e.g. paper notes, calculators).

Of course, **online exams** (option 3) will necessarily be fully open-book.

Finally, you should make clear to students (both in lectures and in writing on QMplus) the specific format of your exam. Furthermore, students should see, in coursework and/or past exams, examples of the types of questions that will be on the exam.

1.4. Exam Setup

Module organisers who are setting either in-person paper exams (option 1) or online handwritten exams (option 3) can use the *LaTeX style file* ([qmulxm23.sty](#)), found on the *QMPlus Staff Intranet*.

The style file works in the same manner as in previous years. Typesetting an exam using this results in a document that resembles traditional mathematics exams at QMUL. Moreover, the style file has been updated, so that it provides appropriate instructions for both our in-person and online exams.

See [Section 4](#) for detailed instructions on how to use the LaTeX style file. Sample exams produced using the latest version of the style file can also be found on the *QMPlus Staff Intranet*.

Note: The style file code has been cleaned up and documented, in case anyone wishes to tweak it.

See [Section 3](#) for detailed instructions on how to set up an online exam on QMPlus. This applies both to purely online exams (options 3a, 3b) and to exams given in an invigilated IT lab (option 2).

1.5. Modules without Exams

A number of *MTH***** modules do not have timetabled final exams. Some of these modules have a project as the final assessment, while others consist only of in-term courseworks.

By university regulations, *such a module must still submit at least 50% of its assessments (by total mark) to external examiners*. Thus, non-exam modules must still take part in scrutiny by external examiners, and hence much of [Section 2](#) still applies to these modules.

See [Section 2.4](#) for details on what assessment(s) to submit for these modules.

2. The Scrutiny Process

A summary of the exam setting and scrutiny process is given below:

- 1) The *first examiner* (module organiser) sets both the main and late summer exams, along with the corresponding solutions. The exams are then sent to the *second examiner* (checker).
- 2) The second examiner works through and checks the exam, and then informs the first examiner of any issues and errors.
- 3) **[Deadline Week 7]** The first examiner corrects anything raised in step 2). The checked exams are then submitted [to OneDrive via the link sent by the Maths Office](#).

Note: *IFoA modules will require additional documentation; see further guidance from [Chris Sutton](#).*

- 4) The exam is sent to the internal *Scrutiny Committee*. Any serious issues that are discovered there are communicated immediately to the first examiner.
- 5) The exam goes to *external examiners* for approval.
- 6) The lecturer will find a [green form on the OneDrive folder](#), with comments from both internal and external scrutiny. The first examiner responds to all points raised on the *green form*, which is then visible to scrutiny and the externals. Hopefully, all parties are satisfied.
- 7) **[Deadline end of Week 10]** The final draft of the exam is [submitted via OneDrive](#).

2.1. Setting the Exam

Final exams will be set using the LaTeX style file (see [Section 4](#) for details) and/or on QMPlus as quizzes (see [Section 3](#) for details).

In general, the key principle is, wherever possible, to *follow the format used in last year's exam*. By university regulations, deviations of this may lead to additional work:

- If this year's exam format differs from that of previous years, or if the module is new, then the module organiser is also responsible for creating an additional practice exam.
- If this year's exam is not appropriate for resit or first-sit students from a previous year (e.g. a previous year covered less material), then the module organiser must create a special exam for students from that year.
- If you are teaching your module for the first time, then do liaise with the previous organiser for your module regarding the preceding two points.

Students should be informed (on QMPlus) well ahead of time about the format of the final exam.

The following lists some basic principles for setting exam questions:

2.1.a. Syllabus Coverage.

The exam should cover a significant portion of the syllabus – a general, albeit vague, goal is to ask something on at least 70% of the syllabus (according to some sensible measure). However, students can expect some variation in topics covered from one year to the next.

You should also be wary of the length of your exam. One recurring problem is that some exams are too long for the time available, even if individual questions were at a good standard. Thus, do avoid covering so much of the syllabus that the exam becomes excessively long.

2.1.b. Question Types.

The exam should contain a mixture of question types:

- **Bookwork:** These involve definitions and theorems, as well as proofs (if applicable).
- **Applications:** These are questions in which students need to apply methods and theorems in order to solve some problem (e.g. computing some quantity).
- **Unseen:** These involve material that calls for more imagination – an unusual application of results, extending a proof from the module to a new situation, etc.

Because of the online and open-book exam formats, the kinds of questions that are appropriate have shifted. Similarly, online exams enable and encourage various forms of cheating, so measures have to be taken to avoid this.

For QMPlus quiz questions, you should *randomise wherever possible*. For example, you could:

- Write multiple questions for a topic, with one randomly selected in each exam sitting.
- Randomise various given numerical values in computational questions.
- Randomise, within multiple choice questions, the order of your answer choices.
- Partially randomise by setting questions that involve students' ID numbers.

Note: *Do make sure, however, that any randomisations that you use are fair. In particular, do avoid situations where one student could encounter much more difficult questions than another, or where different students are tested over significantly different sets of topics.*

For handwritten exams, one must be more careful about the kinds of questions that are asked:

- One should avoid direct bookwork questions (e.g. "state definition X"), since these can be easily copied from available sources.
- Questions of the form "apply this method to compute X" may also be undesirable, especially if there are applications or websites that can do the computation automatically.
- Similarly, avoid awarding too many marks for correct numerical answers (since these can be easily copied and shared), and focus more instead on explanations or work shown.

2.1.c. Difficulty of Exams.

With league tables in mind, the School is under constant pressure to improve "added value", i.e. to give higher-class degrees relative to our students' A-level grades. A big part of achieving this must come from setting exams at a sufficient level to achieve higher marks.

The following principles, though not firm, give a general set of benchmarks:

- In November 2015, the college set a target of 70% first-class and upper second-class degrees (i.e. an overall mark of 60 or above).
- Another target within the School is that 90% of students should pass any module (after resit if needed, and counting no-shows as fails). Roughly, this means that failure rates at the first attempt (among candidates who actually turn up) should ideally be below 15%.
- The average mark should ideally be in the low 60s.

To do this, one must adjust personal views on what "pass" and "first class" mean and set our exams appropriately, relative to the students we have.

Note: *In past years, the School has often scaled exam marks to move grade distributions closer to targets. However, the college has clamped down on this and is much less likely to approve requests for scaling. (Moreover, the college has refused to consider downward scalings altogether.)*

The marks for mathematics exams tend to be more spread out than in other subjects, which makes achieving targets especially difficult. To address this:

- You should employ a variety of difficulties in exam questions. In particular, there should be some rudimentary material to help weaker students pass, along with a bit of tough material to curb marks at the upper end.
- A range of difficulties can be achieved by varying between examples that students have seen (in coursework or lectures) and more unusual settings. However, one should be careful here, as weaker candidates can crumble rapidly at a hint of anything unfamiliar.

2.1.d. Exam Clarity.

You should give students as much guidance as possible about what they are required to do. They are being assessed on their understanding of the module, not their ability to figure out what the lecturer wants them to do.

The following are some points to consider:

- Make sure to indicate on the exam how many marks are available for each question or part of a question. (This does not need to be as fine-grained as the full mark scheme.)
- You should indicate how much justification is required from a question. It is also useful to remind students that they must show their working for computations.
- You can also give guidance on whether students are allowed to quote certain results.

2.2. Exam Solutions

The exam solutions are submitted along with the exam paper. This will be used by both the checker and the external examiners, as it provides a useful measure of the exam's length and difficulty.

There are some important guidelines for exam solutions:

- The document should contain the *full solutions*. In particular, all questions must be solved in full (e.g. "this is bookwork – see lecture notes" is not a full solution).
- You should indicate whether each question is bookwork, similar to examples seen in lectures or coursework, or unseen. This helps assessors judge the difficulty of the question.
- The solution document should include a fairly precise mark scheme. As a general rule, if any part of the scheme awards more than five marks, then it should be further subdivided.
- It may be useful to write out solutions by hand to test how long the exam takes. In particular, you should be able to write full solutions in much less time than is available to students.

2.3. Checking

The checker provides the first safety net for the exam and is responsible for a number of tasks.

- The checker should ensure the exam is free of both typographical and mathematical errors (e.g. are all the necessary hypotheses given when students are asked to prove something).
- The checker should work through the exam. For numerical questions, the checker should go through the calculations. The checker should also flag parts that may be confusing or vague.
- The checker should ensure the exam is of appropriate length and difficulty, as well as make sure the exam covers the module syllabus to a suitable extent.

After checking the exam, the checker sends any comments and corrections to the module organiser.

Note: *The exam draft must be checked before it is submitted. Therefore, module organisers should make sure to allow sufficient time for checking before the Week 7 deadline.*

2.4. Draft Submission

The first deadline is for submitting the checked exam to the Maths Office by the end of Week 7. The exam **should be submitted to OneDrive using the link sent by the Maths Office.**

The following items should be submitted to your designated folders on OneDrive:

1. *Checked main and LSR exams.* Drafts of the two exam papers themselves:
 - (a) *Invigilated paper or online handwritten exam.* It is fine to submit a PDF file containing the exam paper. (The paper can be set using the given *LaTeX* style file.)
 - (b) *QMPlus quiz.* You should submit a PDF printout of the full quiz, as a student may see it. (You do not need to include every possibility of a randomized question; one instance per question should suffice.) One way to create this PDF file is to repaginate your quiz so all questions are on one page, preview the quiz, and then print it to file.
 - (c) *External online quiz.* This depends on the specifics of the external system used, but you should do the closest thing you can to (b).
2. *Exam solutions.* Full solutions to the main and LSR exams; see **Section 2.2** for details.
 - For online quizzes, you need only submit solutions to questions on the PDF printout, that is, you need solutions only to one question per randomized set.

Note: *If you are running a module that is tied to IFoA exemptions, then you will also need to submit an exam commentary document; for details, consult **Chris Sutton**.*

2.4.a. Non-exam Modules.

As mentioned before, a number of modules do not have timetabled final exams, however university regulations dictate that *these modules must still submit at least 50% of their assessments (by overall mark) to external examiners.* Each non-exam module must decide which of its assessments are to be sent to external examiners; some basic guidelines are given below:

- The relevant assessment material should be **sent to OneDrive**, as usual.
- The deadline for submission is the end of week 7, same as for checked exams.

For modules with a single major assessment – worth at least 50% of total mark (but not a timetabled exam) – the process is easy. You need only submit this single assessment to the external examiners.

- Like for exams, the assessment should be checked by the checker prior to submission.

Dissertation modules need only submit the project guidelines and specifications. Later, the marked projects will be made available to the external examiners. This includes the following modules:

- *MTH6138: Third Year Project*
- *MTH717U: MSci Project*
- *MTHM038: Project Dissertation (MSc)*

For all remaining modules (which may need more than one assessment to reach the 50% threshold), what material to submit will be agreed upon between the module organiser and the SEB Chair.

2.5. Scrutiny

The checked exams go through two additional layers of scrutiny before final drafts are completed.

First, the exams go through the internal *Scrutiny Committee*, consisting roughly of the Programme Directors and the SEB and Deputy SEB Chairs. The main role of internal scrutiny is to ensure that the exams maintain a consistent standard across our programmes. (While the committee could also flag other errors in the exam, that is primarily the role of the checker rather than scrutiny.)

- If the Scrutiny Committee finds any major issues, then the module organiser will be notified immediately, so changes can be made before the exams are sent to external examiners.
- Otherwise, comments from the Scrutiny Committee are sent back to the module organiser at the same time as the external examiners' comments.

Next, the exams go to the *external examiners*. These are academics in other UK universities whose role is to ensure our exams adhere to some national standards. In particular, the external examiners must approve all our exams, as that is an essential part of the university's validation process.

2.6. Final Touches

Finally, once the Scrutiny Committee and the external examiners review the exams, their comments are collected by the Maths Office and sent to the module organiser via a document called the "*green form*". (The name comes from the fact that the form has historically been green.)

The "*green form*" will be found in your assigned OneDrive folder. The module organiser should:

- Make any changes suggested by the Scrutiny Committee and external examiners, and **submit updated your exam drafts to OneDrive**.
- **Add any responses to scrutiny and the external to the green form on OneDrive**.

Hopefully, the externals will be satisfied with the updated exams and green form.

If you have an online exam, you can then finalise the exam on your QMPlus page (see [Section 3](#)).

3. Guide for Creating QMPlus Exams

This section provides instructions for setting up online exams on your QMplus page; this applies to both final (main and late-summer) and mid-term exams. [Section 3.2](#) applies to all exam types, while subsequent sections contain specific details for each exam type.

For general QMplus help, please consult the *Learning Environments Team*.

3.1. Overview

Our online exams need to have a consistent appearance across modules. This would be generally helpful to our students, but there are also aspects which are important from the point of view of the exam board (time period when submissions are allowed, not releasing marks prematurely, etc.). So please follow these instructions, and let the *SEB Chairs* know as soon as possible if you think there are issues with these instructions, or if there is something special about your module.

Most online exams will be implemented as QMPlus quiz objects on the QMPlus module page. The exam should be clearly visible on the QMplus page, preferably near the top of the page or in an obviously named section. You may also want to link to it from elsewhere on the page.

There are two types of QMPlus exams that one can have:

- (1) **Handwritten exam:** This consists of a PDF exam paper to be downloaded, with students' solutions then uploaded as a PDF file that is marked manually.
- (2) **Pure/hybrid quiz:** This consists of QMPlus quiz questions (e.g. multiple-choice, numerical, matching), and possibly with a handwritten component. The quiz questions are marked by QMPlus automatically, while the handwritten part is manually marked.

The following sections provide detailed instructions for setting up these QMPlus quizzes.

3.2. Instructions for Setting Up QMPlus Quizzes

To add a quiz onto your QMplus page, click “*Add an activity or resource*” and then choose “*Quiz*”. After this, choose the following settings:

General:

Name: One of the following, as appropriate:

- “*Semester A final assessment*”
- “*Semester B final assessment*”
- “*Late-summer final assessment*”
- “*Mid-term assessment*”

Description: Copy the following text:

- (1) For handwritten exams (replace *[y]* with 3 or 4, and *[x]* with 2 or 3, as appropriate):

This handwritten assessment is available for a period of *[y]* hours, within which you must submit your solutions. You may log out and in again during that time, but the countdown timer will not stop. If your attempt is still in progress at the end of your 4 hours, any file you have uploaded will be automatically submitted.

The assessment is intended to be completed within $[x]$ hours.

In completing this assessment:

- You may use books and notes.
- You may use calculators and computers, but you must show your working for any calculations you do.
- You may use the Internet as a resource, but not to ask for the solution to an exam question or to copy any solution you find.
- You must not seek or obtain help from anyone else.

(2): For pure and hybrid quizzes (replace $[y]$ with 3 or 4, and $[x]$ with 2 or 3, as needed):

This quiz assessment is available for a period of $[y]$ hours, within which you must submit your solutions. You may log out and in again during that time, but the countdown timer will not stop. If your attempt is still in progress at the end of your 4 hours, any answers you have filled will be automatically submitted.

The assessment is intended to be completed within $[x]$ hours.

In completing this assessment:

- You may use books and notes.
- You may use calculators and computers, but you must show your working for any calculations you do.
- You may use the Internet as a resource, but not to ask for the solution to an exam question or to copy any solution you find.
- You must not seek or obtain help from anyone else.

If your module is associated with IFoA exemptions, then please also add the following:

For actuarial students only: This module also counts towards IFoA exemptions. For your submission to be eligible, *you must submit within the first 3 hours.*

Display description on course page: Check

Timing:

Open the quiz: Check “*Enable*” and put the start time of the assessment.

(If you not know your exam time/date, then you can just put some random date for now. Be sure to update this once the exam timetables are released!)

Close the quiz: Check “*Enable*” and put:

- **Level 4 module:** 3 hours and 5 minutes after the start time of the assessment.
- **Level 5-7 module:** 4 hours and 5 minutes after the start time of the assessment.

Time limit: *Disabled.* (Make sure “*Enable*” is unchecked.)

When time expires: “*Open attempts are submitted automatically*”

Grade:

Grade category: Uncategorized

Grade to pass: Leave blank

Attempts allowed: 1

Layout:

New page: “*Every question*” is probably best.

(This lets students save progress as often as possible; we have had past cases where a page with many questions did not submit correctly due to connection issues during the exam.)

Navigation method: Free

Question behaviour:

Shuffle within questions: Up to you

(This is only relevant for (2).)

How questions behave: Deferred feedback

Review options:

Uncheck *everything* possible.

(After adding quiz questions, return here and ensure the *only* ticked boxes are the two labelled “*the attempt*”, under the categories “*During the attempt*” and “*Immediately after the attempt*”).

Appearance:

Show the user's picture: No image

Decimal places in grades: Up to you

Decimal places in question grades: Up to you

Show blocks during quiz attempts: No

Safe exam browser:

Require the use of Safe Exam Browser: No

Extra restrictions on attempts:

Require password: Don't do this...

Require network address: ...or this

Browser security: None

Allow quiz to be attempted offline using the mobile app: No

Students cognisance of plagiarism policy:
“must be acknowledged before starting an attempt”

Overall feedback: Leave *everything* blank

QMPlus has been recently updated, and you may get an error message *“You must fill in the feedback boxes without leaving any gaps”* here. In this case, go to the second big input box, click the “</>” button. This should reveal some HTML code, which you should delete. That should fix the issue, and you should be able to successfully create the quiz object.

Common module settings:

Availability: ***Hide from students***
(To avoid panicked questions from students, do hide the exam until after Week 12.)

ID number: Leave blank

Group mode: No groups

Restrict access:

Access restrictions:

- *Main assessments:* Leave this well alone.
- *Late-summer re-assessments:* Restrict access to only the eligible students.
 - You can create a group (under “Users => Groups” on the “Settings” window on the main page) named *“LSR exam”* or something similar.
 - Add all the reassessment students to this group.
 - To add the restriction itself, back in the page for creating the quiz, click the “Add Restriction” button, click the “Group” button, and select the group you made.

Tags:

Tags: No selection

Competencies:

Course competencies: No selection

Upon activity completion: Do nothing

Then “*Save and display*” your quiz before adding questions as appropriate to the format of your assessment (see further below).

3.2.a. Special Examination Arrangements

We no longer need to manually assign extra time to students with exam access arrangements.

- Regarding IFoA exemptions, any extra exam time added to the 3-hour limit will be handled centrally by the Maths Office; this needs not be set up in QMPlus.

3.3. Specific Instructions for Handwritten Exams

For this option, your quiz will probably just consist of a single essay question containing the PDF of the question paper. The recommended steps are below.

Starting from a newly created empty quiz...

3.3.a. Creating an Essay Question.

On the main “*Edit Quiz*” page, click on “*Add*” on the right-hand side of the main panel, choose “*a new question*”, and then choose “*Essay*”. From here, choose your settings as follows.

General

Category: Up to you

Question name: Up to you (students don’t see it) but “*Exam paper*” works fine.

Question text:

1. Copy the following into the text box:

Click on this link to access the exam paper.
All work should be handwritten and should include your student number.
When you have finished:

- scan your work, convert it to a single PDF file, and upload this file below;
- before submitting your exam solutions, make sure to **check that you have properly uploaded the correct file**;
- after submitting, e-mail a copy to maths@qmul.ac.uk with your student number and the module code in the subject line.

2. Highlight the first line “*Click on this link ... exam paper*” with your mouse, click on the little chain icon (usually found in the top right), and then click “*Browse repositories*”.

3. Choose the file picker option to “*Upload a file*”, select your exam paper, and then click “*Upload this file*”.

4. You should make the link to the exam paper (from step 2) as prominent as possible. You can do this by enlarging the text and by using a different colour.

Default mark: 100

General feedback: Leave blank

ID number: Leave blank

Response Options:

Response format: No online text

Require text: *Should be greyed out*

Input box size: *Should be greyed out*

Allow attachments: 1

Require attachments: 1

Accepted file types: *.pdf* (unless you need some other kind of submission)

Response template: Leave blank

Grader information: Leave blank

Tags: Any tags

3.3.b. Finishing Touches.

Click “*Save Changes*” at the bottom to create the essay question and return to the *Edit Quiz* page.

From here, there are only a couple checks to make:

- Make sure the number to the right of your essay question is “100” (and not “0”).
- Make sure that the “*Maximum grade*” also has value “100”.

Note: *Before finishing, you should preview your quiz to make sure everything runs as intended.*

3.4. Specific Instructions for Pure/Hybrid Quizzes

To add questions to the quiz, click on “*Edit quiz*” and then “Add” on the right-hand side. You can either add questions directly here or import them first into the question bank. For details on creating questions of different types see, e.g., the documentation by *Alex Fink* on the Staff Intranet.

You are free to use whatever question types you like. In addition, you can choose whether or not to “*Shuffle*” (i.e. randomize) the order of questions within the quiz.

You should set “*Maximum grade*” to “100” and ensure that “*Total of marks*” is the same. (If you have set everything up correctly, then all the marking should be automatically done by QMplus!)

If you are running a hybrid quiz, then you will also add one or more essay questions for students to submit handwritten solutions. For the essay question(s), you can choose whether to simply write the question in the text box or to attach a PDF as in [Section 3.3](#). (For the latter, you may wish to use Basic Mode in the LaTeX style file; see [Section 4](#) for details.)

If you require handwritten solutions from students, then you should also mention that “*submissions must be handwritten and converted into a single PDF file*”.

Note: *After the assessment closes, the quiz questions will be automatically marked, but any essay question will show as “Requires grading” and will need to be manually marked (either by entering comments online or annotating a downloaded PDF) and have a mark entered.*

Note: *Before finishing, you should preview your quiz to make sure everything runs as intended.*

4. Guide for the LaTeX Style File

The *School of Mathematical Sciences LaTeX style file* contains a variety of features for typesetting exam papers, as well as individual exam questions, in a consistent manner. This allows you to focus on the actual questions in the exam paper, rather than on the paper's appearance. Moreover, there are other handy features, such as a tool to count the total number of marks available.

This section is a guide for using this LaTeX style file for writing exam papers. General competence with LaTeX is assumed. (If this is not the case, then please seek separate resources for this.)

Sample exam papers can be found in the files *sample_exam_*.tex*, which are found in the QMPlus Staff Intranet. You should look at these files in conjunction with this manual.

4.1. Recent Additions

The main new features for this academic year reflect that we are running both in-person and online exams. Thus, the style file contains functionality for handling both cases.

First, some new commands have been added to reflect the new policies for this year:

- The default exam duration has been set at all levels to *4 hours*. (This can still be overridden through the `\examtime{}` command.)
- There is a new setting that contains the intended completion time for the exam. The default value for this is *2 hours*, but this can be overridden through the `\examlength{}` command.
- There is a new `\exammode{}` command in the preamble that indicates which type of exam document to produce: *in-person exam*, *online exam*, or *basic mode*. Moreover, *basic mode* is now invoked through this `\exammode{}` rather than through the `bscbasic` environment.
- For in-person exams, there is an extra rubric setting `\openbook` that indicates the exam will be open book, with three A4 sheets of notes allowed.

Also, some settings that were previously available for paper exams are once again enabled:

- Calculator settings (`\yescalc`, `\nocalc`, `\statcalc`).
- Having the exam paper be the answer book (`\writeon`, `\writehere`, `\mywritehere`).

As usual, see both the instructions below and the sample exam files for further details.

4.2. Setup

You will need the following files:

- The style file itself, named *qmulxm23.sty*.
- The image file *QMlogo.pdf* for the QMUL logo. (This is displayed on the exam paper.)

Be sure to place both files in the same directory as your exam *.tex* file (or in another directory where LaTeX can find the files).

4.3. Start of the File

The style file is intended for use with the *book* document class. Thus, you should start your *.tex* file with the following line:

```
\documentclass[12pt, a4paper]{book}
```

You should use either the *11pt* or *12pt* option (for *11pt* or *12pt* font size). If you use *12pt*, and you find that the front page of the exam paper is very crowded with text, then you can change to *11pt*.

You can then call whichever LaTeX packages you need (e.g. *amsmath*, *amssymb*), including the all-important style file itself:

```
\usepackage{qmulxm23}
```

Note: *The amsthm package conflicts with qmulxm23, so you should avoid using it. Aside from this, there are no other known package conflicts. In case of unforeseen problems, you can call qmulxm23 after other packages have already been invoked.*

4.4. The Preamble

In addition to whatever else you do in the preamble (defining custom commands, etc.), you need the following commands (appropriately modified) to set up the data pertaining to the exam:

```
\coursetitle{Sample Module}
\coursecode{MTH9000}
\coursecode{MTH9000P}
\exammode{paper}
\examyyear{2023}
\examtime{4 hours}
\examlength{2 hours}
\setter{L. Euler, B. Pascal}
```

Many of our modules have more than one module code. When this is the case, then all codes should appear on the front of the paper. Use a `\coursecode` command for each module code, as above.

Note: *If your exam is for two modules with different titles (such as MTH5112: Linear Algebra I and MTH5212: Applied Linear Algebra), then you should produce a separate version of the exam paper for each title, rather than trying to cram all the titles into one document.*

The new `\exammode{}` command indicates the type of exam document that will be created. The key difference among the three types is in the instructions that are printed on the front page:

- `\exammode{paper}`: This produces an in-person *paper exam* and prints instructions specific to traditional invigilated paper exams.
- `\exammode{online}`: This produces a handwritten *online exam*, and it prints instructions for an assessment taken and submitted online on QMPlus.
- `\exammode{basic}`: This invokes *basic mode* and prints no instructions on the front page. This is useful for setting a midterm test or the handwritten part(s) of an online hybrid exam.

The exam duration can be set using `\examtime{}` (the default value is *4 hours*).

The intended exam time can be set using `\examlength{}` (the default value is *2 hours*).

Both the first and second examiners should be named in the `\setter{}` command.

Next, you need to specify which exam period this paper is for, by using one of the commands:

```
\january
```

`\may`
`\latesummer`

If the paper is a special exam for resit and first-sit students that is given only in the January or May exam period, then you should invoke the command `\resittrue`.

There are some additional optional commands:

- Use `\qmarksfalse` if you do not want the total number of marks for each question to appear at the start of every question.
- Use `\showmarks` if you want to see a running total of marks available. (This feature is useful while writing the paper, but be sure to remove this before passing the exam to your checker).

Paper exams only: Use the `\writeon` command if you want the question paper to also serve as the answer booklet. (*Note: Unless you have a very good reason to use this, then it is best to avoid it. In the past, this required a request to ARCS for the exam booklet to be drilled in the corner so that supplementary booklets can be attached, and it is not clear they will accommodate now.*)

- See the sample file `sample_exam_main.tex` to see how this feature is used.

Once the preamble is finished, you should

`\begin{document}`

as usual. The contents of the exam will then be placed within the above *document* environment.

4.5. The Front Page

Immediately after the `\begin{document}`, you need

`\begin{bscexam}`

Note: *The environment is always `bscexam`, even for an MSc paper.*

If you are in *basic mode*, then you can skip to the next section and get right to setting the questions.

Otherwise, for *paper* and *online exams*, you will need to set a rubric:

`\begin{rubric}`

Use one of the following commands to print the appropriate instructions on the front page:

- `\rubricall`: Most staff will use this rubric, which produces the following instructions:

You should attempt ALL questions. Marks available are shown next to the questions.

Note: *Unless you have a compelling reason to do otherwise, then it is best to keep things simple and stick with this rubric.*
- `\rubricbest{m}`: You should replace *m* with the number of questions you want students to answer, written as a word rather than a figure. This produces the following instructions:

You may attempt as many questions as you wish and all questions carry equal marks. Except for the award of a bare pass, only the best m questions answered will be counted.
- `\rubricsections{m}`: Here, you should replace *m* with the number of questions you want the students to answer in Section B. This produces the following instructions:

This paper has two sections. You should attempt all the questions in Section A. In Section B you may attempt as many questions as you wish. Except for the award of a bare pass,

only the best m questions answered in Section B will be counted.

If you use this rubric, then you should then begin Sections A and B with

`\section*{Section A}`

`\section*{Section B}`

with Section B starting on a new page.

- If your module is somehow special, so that none of the above rubrics is suitable, then (if you have the express permission of the exam board chair) you can write your custom rubric with

`\myrubric{}`

The rubric wording should go inside the `{}`. One simple example is the following:

`\myrubric{This paper has 15 questions. 12
correct answers are needed to pass.}`

Paper exams only: You should specify whether your exam is *open-book* or *closed-book*:

- For open-book exams, add the command `\openbook`.
- For closed-book exams, you do not need to add anything here.

This adds appropriate instructions to the front page.

Paper exams only: You should also set the appropriate instructions regarding calculators.

- `\nocalc`: This option forbids all calculators in the exam.
- `\yescalc`: This options allows for approved non-programmable calculators to be used.
- `\statcalc`: This option, in addition to the above, also allows statistical functions.

This adds appropriate instructions to the front page.

Note: In contrast, *online exams* must be open-book and must allow all calculators.

Finally, you should finish off the front page with

`\end{rubric}`

If you are not in *basic mode*, then you should start a new page for the exam questions:

`\newpage`

4.6. The Body

At the beginning of the next page, you have the option of giving general instructions to candidates or setting out notations. You can do this with the command `\instructions{}`, which will put your given instructions within a nice box:

`\instructions{In this exam paper, \mathbb{R} denotes the set of
real numbers. In any question, you may freely use the
Riemann Hypothesis. Answers should always be simplified
as much as possible.}`

After this you should have `\section*{Section A}` if you are using the “two sections” rubric. You are then finally ready to write some questions!

Each question should use the *question* environment. Make sure a question does not split between pages (insert a `\pagebreak` before the question to avoid this), unless the question is so long that it will not fit on one page (in which case consider carefully where the best place is to split it).

Within each *question* environment, use an *enumerate* environment to set the parts of the question, which will automatically be labelled (a), (b), and so on. For each part, you should state the number of available marks using the command `\marks{}` at the end of that part. The total number of marks available for the question is automatically displayed by the question number (though you will have to compile your document more than once for this to appear correctly).

```
\begin{question}
Let  $G$  be a finite group.
\begin{enumerate}
\item Define what is meant by a \emph{subgroup} of  $G$ . \marks{2}
\item Prove that if  $H$  is a subgroup of  $G$ , then

$$|G| = |G:H| |H|$$
 \marks{6}
\end{enumerate}
\end{question}
```

Note: If a question part ends with a displayed equation, then it's better to put the `\marks` command inside the displayed equation so that it lines up correctly.

If you want to issue instructions to candidates part-way through a question, then you should use the command `\interject{}`, with the instructions inside the `{}`. (More specifically, this suspends the *enumerate* environment; writes the instructions with appropriate spacing and indentation; and then resumes the *enumerate* environment with the correct numbering.)

```
\begin{question}
\begin{enumerate}
\item Define what is meant by a \emph{relation} on a set  $X$ . \marks{2}
\interject{Now let  $X = \{1, 2, 3\}$  and let  $R$  be the empty relation.}
\item Is  $R$  reflexive? \marks{2}
\item Is  $R$  symmetric? \marks{2}
\end{enumerate}
\end{question}
```

Note: The exam setting notes from Registry stipulate that text should not be right-justified, and that neither italics nor underlining should be used for emphasis, as these can make text more difficult to read for some students. The style file automatically invokes `\raggedright` and redefines `\emph` to give bold rather than italics. However, if you use `\textit` or `\it` for emphasis, then please modify your code accordingly (e.g. use either `\emph` or `\textbf`).

Finally, you can use `\nextquestionnumber{N}` to force the following question to have the number *N*. This can be useful, for example, if you are writing a document containing only Question 3.

4.7. End of the File

Once you have written all the questions, you need to

```
\end{bscexam}
```

Now, the only thing left is the appendix (if needed). This can be set using the *appdx* environment.

```
\begin{appdx}
```

```
This appendix contains material for Question 4
```

```
...
```

```
\end{appdx}
```

Finally, at the very end, you can

```
\end{document}
```