

## Part IIB Examiners and Assessors: Faculty Board guidelines

Guidelines approved by the Faculty Board for use in 2019-20.

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## Guidelines for Examiners and Assessors: key points for all Parts

### General points

1. Examiners and Assessors are required to adhere to the timetable and detailed instructions provided by the Chair of Examiners.
2. Examiners must follow all aspects of the agreed policies on security.
3. Form and conduct notices that detail any changes to the examinations from the previous year are published annually in the Cambridge University Reporter.
4. External Examiners have an important role to play in our examinations. In particular, Examiners should pay due attention to comments made on their draft papers by the External Examiner.
5. The General Data Protection Regulation (GDPR) 2018 requires that any data retained must be communicated to students on request. The Faculty Board Office retains marks books and the students will receive transcripts giving a breakdown of their marks. Examination scripts are not normally released, but any written comments made by the Examiners (excluding ticks and minor notational marks) would need to be transcribed and made available. Examiners must therefore adhere to the script marking guidelines given below so that data can easily be made available to students who make a request under the GDPR.
6. All Examiners, Assessors and those involved in the administration of exams are expected to treat all aspects of the exam process, which are not included in publically available material, as confidential. This includes details of all discussions between the Examiners, Checkers, Examinations Secretaries and the examinations support team.

### Purpose of Tripos exams

1. The purpose of the Tripos exams is to determine the extent to which candidates have achieved the aims and objectives of the lecture courses. Exams should test students on whether they:
  - (a) have understood the basic principles with which they have been confronted, and their limitations;
  - (b) have developed skills in applying basic principles to the solution of straightforward problems, and;
  - (c) have developed a deeper understanding, allowing them to tackle problems that are, for them, novel.

### Setting the paper

1. In setting the paper, Examiners should attempt to cover most of the course syllabus and no major topic should be completely omitted. Questions should be of uniform difficulty. Setters should study the papers and Examiners' reports from previous years and note which questions proved satisfactory and which did not. No major changes should be made to the structure or style of papers without consulting the Chair of Examiners: it may be necessary to issue a sample paper. The best indication of the work that has been covered is obtained from the course hand-outs and examples papers. Lecturers should always be consulted and shown the questions on their part of the course.
2. Examiners have a tendency to set questions which are too difficult. When a lecturer, checker, or External Examiner warns that a draft question is too difficult, history shows that he or she is almost always correct. It

is important for Examiners to act on such comments.

### Structuring the questions

1. Exams should be structured so that very able students will distinguish themselves above the rest and less gifted, but conscientious, students will achieve a safe II.2 level mark.
2. Questions with only one substantial point are unsatisfactory because candidates either get very high or very low marks. Questions should whenever possible be 'scaffolded', i.e. structured as a series of closely linked steps.
3. If a question requires the derivation of a key equation *en route*, candidates should be specifically asked to derive it as an intermediate result. Not all is then lost in later parts of the question if they have been unable to perform the derivation correctly. Lengthy or difficult algebraic manipulation should be avoided.
4. **Symbols** used in questions should be clearly defined except where the definitions are systematically provided in examination data books or data sheets.
5. It is most important that Examiners always keep in mind the time available for answering a question. They should also remember that questions are often greatly improved by including a diagram.
6. **Essay type questions** are rarely answered really well or really badly. Engineering students may avoid essay questions because they know there is little chance of gaining high marks. If a question simply asks

'Discuss the design parameters for a high-speed switching bipolar transistor',

then mediocre answers can be expected. A better way of structuring the question would be:

'For a bipolar transistor:

- (a) Explain the concept of minority carrier stored charge in the base.
- (b) Outline the effect of current crowding at the base, indicating why it is deleterious and how these deleterious effects are combated.
- (c) Explain what causes breakdown in the collector of a transistor and why an increase in the breakdown voltage increases the transit time for the relevant charge carriers.

Hence, discuss criteria for the design of a high-speed switching bipolar transistor.'

This type of structure will help students to provide appropriate answers, ensuring some uniformity and making for easier comparisons and better marking. The important points expected in the answer should be identified, and form the substance of the crib. Some open-endedness towards the end of an essay question is desirable, however, so that better candidates can display their knowledge.

Please see the Part-specific guidelines.

### Checking the draft papers

1. Checkers have a most important job. They ensure that questions are valid, clearly expressed and of the correct level of difficulty. The checker must write solutions for every question independently of the setter: simply accepting an Examiner's explanation without a clear understanding is unacceptable. After checking, a detailed and easily readable crib comprising the model solutions and marking scheme is prepared by the Examiner in consultation with the checker.
2. At this stage, the examination paper and crib should be, in the view of the setter and checker, ready for market in every respect. This includes not only the length, difficulty, content, and style of each question, but also the presentation details such as layout (including diagrams), sentence structure, grammar, and punctuation. If these aspects are covered conscientiously by the setter and checker at an early stage it saves everyone a very large amount of time and work later on. It is not acceptable for semi-complete draft papers to proceed to the reading meeting.

### Script marking guidelines

1. All aspects of the marking process must be fully auditable and defensible in case of an appeal.
2. Examiners should adhere to the marking scheme indicated on the exam paper and crib. The exam paper will show the approximate number of marks for each part of a question in the right margin, the mark to be level with the end of the paragraph(s) to which it refers.
3. Scripts should be marked **in red ink** using the following guidelines:
  - i. mark to whole numbers (do not use half marks);
  - ii. tick or score through every page to indicate that the page has been seen;
  - iii. put sub-marks in the right-hand margin - these must correlate with the breakdown on the paper;
  - iv. circle the total mark for each question at either the start or the end of the question;
  - v. record the marks on the script cover sheet;
  - vi. keep the scripts in the correct order.
  - vii. **no comments whatsoever should be made on the scripts.** Under no circumstances should an Examiner write any comments about a candidate's performance.
4. Calibrate the marking to comply with the required mark distribution. If, after about 20 scripts, it appears that adjustments will be required to produce a mark distribution in line with that required for that particular Part of the Tripos, the marking scheme can be revised slightly and the scripts remarked. If major adjustments are required, the Chair should be consulted.
5. When marking a large number of scripts, standards may shift slightly. It is therefore best not to mark whole scripts at a time as some candidates may get a raw deal. After doing the calibration described above, divide the scripts into piles, then mark Q1 right through starting with pile 1, then Q2 right through starting with pile 2, and so on.
6. Silly arithmetical and algebraical mistakes should not normally be penalized heavily. It is very troublesome when an early minor error gets carried through a solution: the Examiner then has no choice but to follow the whole solution in detail to check the correctness of the later work. Questions should be structured to avoid this waste of time.
7. Transfer the raw marks for each question to the excel markbook provided. NB. where a candidate answers more than the required number of questions the Examiner should mark all the questions answered and then exclude from the marks recorded the question(s) scoring the lowest mark(s).
8. **Scaling** of the marks may be required by some Triposes. In such cases, the Chair will issue instructions as to how to proceed.

### Useful links

- [Marking & classing criteria](#)
- [Exam paper templates and style recommendations](#)
- [Data security & the production of exam papers](#)
- [Exam data retention policy](#)
- [Statement on Tripos transparency](#)
- [Regulations for the Engineering Tripos](#)
- [University guide to undergraduate examinations](#)
- [University guidance for staff on examinations](#)
- [Note on plagiarism and academic misconduct](#)
- [Guidance on Departmental involvement in Examination Reviews](#)

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## Guidelines for Examiners & Assessors: Part II information

### Summary of duties

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1. **Principal Assessors** are responsible for setting and marking the examination papers and preparing the cribs.
2. **Second Assessors** assist the Principal Assessors. In particular, they should scrutinize all the coursework exercises for the module as a means of quality control and confirm in writing to the Chair of Examiners that the length/workload and content are appropriate.
3. **Group Examiners** have overall responsibility for ensuring that the quality assurance procedures are maintained within their group. Their level of responsibility is above that of the Principal Assessors.

### Setting the paper

1. Questions should aim to examine the current year's work as listed in the objectives and syllabus for the module.
2. Papers should be set at a level of difficulty that will produce an average mark in the range 60% to 65% on each paper.
3. The three-part question structure used in Part I can be used, but in Part IIA and IIB papers the problems may place more emphasis on deeper understanding and the allocation of credit to the different parts of a question will reflect the change in emphasis.
4. At Part II Examiners should include questions which require students to synthesize information to check that the students have a good understanding of the topic.

### Marking and scaling

1. The Principal Assessor is responsible for the marking of the coursework. Any subcontracting of marking must be approved **ahead of time** by the Teaching Office and Chair of Examiners.
2. As the standard of questions may change from year to year and between modules, it is recommended that Assessors check that their setting and marking have not been either unduly severe or unduly lenient.
3. Each module is normalised individually according to procedures agreed by the Board of Examiners. Scaling should be used where necessary, and to the least degree consistent with producing the required change. Where an Assessor finds a serious discrepancy arising, the Chair should be consulted and consideration given to either modifying the marking scheme or otherwise adjusting the marks.
4. Where marks have been normalised, the Examiners at their meetings will consider only the normalised marks in their discussions and in reaching their decisions.

### Cribs and reports

1. The Faculty Board requires every Assessor to provide a written report on the examination or coursework assignment to be sent to the Chair at the time the marks are handed in. A copy of the report is to be placed in the Assessor's file for the Assessor in the following year. Where raw marks have been adjusted, the effect of the adjustment on the raw marks must be recorded in the report.
2. Assessors are required to provide cribs for their papers. The Faculty Board recommends to Assessors the practice of including in the cribs comments that may serve as a useful guide to future students. Specific comments may be added after each solution. Alternatively the section of the Assessor's report that deals with individual questions may be reproduced on the last page of the crib. Assessors should update their crib in the light of examination marking where necessary and ensure that this updated version is supplied for putting on the web for future students.

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## Guidelines for Examiners and Assessors: Part IIB supplement

### Part IIB supplement

#### Sections in this supplement

Key responsibilities for each role are outlined below. The Chair and the Chair's Secretary will issue more detailed instructions by email, which will include specific deadlines.

- [Responsibilities of Principal Assessors](#)
- [Responsibilities of Second Assessors](#)

- [Responsibilities of Group Examiners](#)
- [Project assessment guidelines](#)
- [Links to additional information](#)

### Responsibilities of Principal Assessors

1. Send details of any changes to the [form & conduct of the exam](#) (compared to the previous year's paper) to the Chair's Secretary for approval by the Faculty Board and publication in *The Reporter*.
2. Inform the Chair & Teaching Office of any staff who will be essential to setting/marking the examination scripts and/or coursework if they are not already on the list of Assessors. NB. While two assessors are essential for quality assurance, more may be detrimental to coherence.
3. Inform students during the lectures which, if any, Part II data sheets will be available during the examination. NB. All Part I Engineering Tripos data books will be available during the examinations.
4. [For open note exams only] remind candidates before the exam that they may bring to the examination **only**:
  1. lecture notes that were handed out by the lecturers for that particular module;
  2. any hand-written notes that the candidate has made personally;
  3. or exceptionally, other specific notes authorised in writing by the Principal Assessor.
5. Follow the guidelines on setting exam papers in the notes [for Part II examiners](#) and using the [Department's exam paper templates & formatting instructions](#) (including proper use of version numbers).

NB. The style of IIB papers should be appropriate for the final examination of the four-year course. A well-posed question should have a straightforward knowledge-based part that most candidates will be able to answer and should contain an application/design component where possible with the level appropriate for the MEng degree.
6. Provide copies of the paper in the final format (plus cribs and Part II data sheets if relevant) to the Group Examiner and the Chair's Secretary.
7. Take the External Examiner's and/or Group Examiner's comments into account when producing the final version of the paper.
8. Read the exam papers out loud to the Group so that the quality, formatting and clarity of the questions can be scrutinized. Amend the papers as necessary afterwards.
9. Attend the examination for the module. If this is not possible arrange for a Deputy to attend who can answer candidates' queries (generally the Second Assessor). Notify the Chair and the Teaching & Examinations Coordinator in advance of any such arrangements.
10. Mark the examination scripts in line with the Department's [script-marking guidelines](#).
11. Follow the guidelines on marking coursework, penalising students for lateness, handing back work, etc as set out in the [IIB module leaders' notes](#).
12. Assemble the marks for the module in line with the Chair's guidance on the required general distribution of marks, the general scaling procedure to be following to achieve it, and the detailed scaling guidelines for each module.
13. Ensure that the marking scheme is clear, consistent and unambiguous so that the marks can be readily checked. NB. Scripts should be placed in the script envelope in numerical order, together with a copy of the examination paper and crib. All scripts should be returned for checking.
14. Create a report on the examination/coursework and deliver this, plus the markbook, scripts and any changes to the cribs (if applicable) to the Chair's Secretary.
15. Respond promptly to queries from the script-checkers. NB. Any amendments to markbooks must be initialed and dated by both the script-checker and the Principal Assessor.
16. Assessors who are not Group Examiners, do not attend the final Examiners' meeting.

### Responsibilities of Second Assessors

Second Assessors should:

1. Have the knowledge and expertise to teach and assess the module if necessary. For very specialised modules Subject Groups might need to appoint Second Assessors from elsewhere in the University.
2. Read examination questions and solutions as agreed with the Principal Assessor, to ensure as far as possible that the questions are conceptually correct, properly posed, appropriate for the syllabus and of an acceptable length and difficulty.
3. Undertake all the coursework exercises for 'their' module and confirm in writing to the Chair of Examiners

that the length/workload and content are appropriate.

4. Be prepared to deputise for the Principal Assessor during the exam if s/he is unavoidably absent.
5. Mark examination scripts and coursework as agreed with the Principal Assessor, fully comply with the Department's [script-marking guidelines](#) and hand the marks and examination scripts to the Principal Assessor by the required date.

In addition, Second Assessors of imported "4I" modules should:

1. Liaise with the course leader, who is often in another department, to ensure that the information on the CUED website about the module is correct well before the module starts, to allow students to make informed choices.
2. After the module has been marked ensure that the CUED electronic mark-book is correctly completed and the Assessor's Report is submitted to the Chair's Secretary by the specified deadline.

### [Responsibilities of Group Examiners](#)

#### **Group Examiners (Modules)**

1. Collect all papers, cribs and Part II data sheets for their Group (and chase absent papers) and deliver them to the Chair's Secretary.
2. Check that exam papers:
  1. follow the format of the previous year's paper, unless details of the changes have been included in the Form & Conduct Notice;
  2. conform to the Department's formatting guidelines, including proper use of version numbers;
  3. are accompanied by suitably helpful cribs and any required Part II data sheets. NB. indicative percentage marks approximating to the relative weighting of different sections of a question should be shown on the exam paper and the crib. Even with essay questions the crib should show the key credit-earning points.
3. Set up reading meetings at which Principal Assessors read their paper out loud to the Group so that the quality, formatting and clarity of the questions can be scrutinized and to ensure the External Examiner's comments have been considered.

#### **Group Examiners (Projects)**

1. Ensure to the best of their ability that all projects undertaken by students within their Group have a specification which is potentially capable of providing appropriate work for the MEng degree. NB. Such work should have elements of study, design and implementation and should contain practical and theoretical or software elements. The scale of the work must be such that the students of MEng calibre are able to complete all the elements within the allocated time.
2. Monitor the grades of the projects within their Group and satisfy themselves that, to the best of their judgment, there are comparable grades for comparable standards of achievement.
3. Ensure that at each stage of assessment the Supervisor's and Assessor's guideline marks are supported by appropriate comments on the mark forms.
4. Moderate the grades awarded by the Supervisor and Assessor at the end of the assessment, according to the procedure described on the moderation form.
5. Follow the more detailed guidelines which are issued by the Project Coordinator, Teaching Office and Project Group Administrators. Also see the [notes for IIB project supervisors](#).

#### **Attendance at Examiners' Meetings**

1. All Group Examiners must attend the Examiners' meetings (an initial meeting in Michaelmas Term, a pre-meeting of CUED Examiners prior to the Final Meeting and a Final Meeting with External Examiners present). The final meeting can only be missed if permission from the Vice Chancellor has been obtained in advance.

### [Project assessment guidelines](#)

1. For a breakdown of credit between the various assessed components, see the [project, coursework & examination credit notice for Part IIB](#).
2. Marks for Progress and Industry are awarded by the Project Supervisor.
3. All other elements of the project are graded independently by two markers. The first marker is the Supervisor. The second marker (Assessor) is appointed by the Group Coordinator, who is also the Group Examiner (Projects). Normally the same Assessor is appointed for the Michaelmas and Easter presentations and also for all aspects of the project assessment. At the end of the year, each marker reviews the guideline marks they have given on all components and makes a recommendation for an overall grade: I/II.1/II.2/III.
4. It is the responsibility of the Coordinator to arrive at a single moderated grade for each student. If the two markers do not agree in their recommendations a moderation procedure is followed.
5. No scaling of project marks is carried out.

### [Links to additional information](#)

- [Prize guidelines for Part IIB Examiners](#)
- [Practical information about Part II exams](#)
- [Form & conduct of the examinations](#)
- [Part IIB project, coursework and examination credit notice](#)
- [Part II scaling description](#)
- [Notes for IIB project supervisors](#)
- [Notes for IIB module leaders](#)

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