MET Part IIB Examiners and Assessors: Faculty Board guidelines

Guidelines approved by the Faculty Board for use in 2024-25.

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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. Under the current modes of assessment pilot the requirement to publish form and conduct notices in the Reporter no longer apply. However the principal that students should be informed well in advance of changes does and it is vital that departmental processes on course and examination change are followed.
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 may be communicated to students on request. The Faculty Board Office retains mark books and the students will receive transcripts giving a breakdown of their marks. Examination scripts are not normally released and are exempt from disclosure, 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 and to allow students to demonstrate that they have achieved the AHEP 4 learning objectives specified by the Engineering Council. 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 complex problems that are, for them, novel.

Setting the paper for all Parts

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 difficulty 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

Guidelines for Examiners & Assessors: Part II information

Summary of duties

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, plus any imported modules requested by the Chair of Examiners. Their level of responsibility is above that of the Principal Assessors.

Setting the paper for Part II

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.
5. Each questions must be checked independently by two appropriate people, usually the Principal and Second Assessors. Both should prepare independent solutions.

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.

MET Part IIB supplement

Setting the paper

1. Questions should aim to examine the current year's work. This may encompass not only material in the specifications for taught modules, but also generic topics covered in other elements of the course such as project work and industrial visits.
2. The first checker for each question will be nominated by the Board of Examiners, the second checker will normally be the Examiner, or, when questions are provided by the Examiner, another Lecturer.

Further information about the assessed elements

1. Two written papers will be set. Each will normally comprise six questions and candidates will be required to attempt four:

Paper 1 will consist mainly of questions on technological aspects of Manufacturing Engineering.

Paper 2 will consist mainly of questions on managerial aspects of Manufacturing Engineering.

Credit will be given for answers which draw on relevant knowledge gained from experiential aspects of the course such as projects and industrial visits.

2. The assessment of the Robot Lab takes account of team-working, together with an individually assessed component. The exact criteria and mode of assessment will be notified to the students at the start of the project.
3. Group industrial projects are assessed according to criteria published in the MET IIB Handbook. Project marks are subject to normalisation by the Project Coordinator in discussion with the Chair of Examiners and the Course Director.
4. The individual Long Project is assessed according to criteria published in the MET IIB Handbook. The report is marked independently by the Academic Supervisor and an internal Assessor. Any discrepancies in marks awarded are discussed and a single mark agreed. Where the discrepancies are more than 10 marks, or there is a failure to agree a mark, the Project Coordinator is consulted. The Chair of Examiners and the Course Director may also be consulted.
5. Also see the project, coursework & exam credit notice for Part IIB MET.

Prizes

The Morcom Lunt Prize and the Institution of Engineering and Technology Manufacturing Engineering Student Prize should be awarded, at the discretion of the Examiners, to the most outstanding student in MET IIB, taking into account both examination and project performance.

The Prize for the best performance in projects should normally be awarded to the candidate with the highest aggregate mark in coursework (industrial assignments and robot lab).

Related links

- Regulations for the Manufacturing Engineering Tripos
- Project, coursework & exam credit notice for Part IIB MET