



GOVERNMENT OF MALAWI
**MALAWI ENGINEERING
INSTITUTION**

(Malawi Engineering Institution Act, 2019)



ENGINEERING REGISTRATION COUNCIL

GUIDELINES FOR ENGINEERING QUALIFYING EXAMINATIONS

1. Introduction

Section 25 (1) of the Malawi Engineering Institution (MEI) Act requires that all people who engage in the practice of engineering in Malawi and those who hold themselves out to be entitled to do so should register as a member of MEI through the Engineering Registration Council (ERC). One class of such membership is Professional Engineer. One way of becoming a Professional Engineer is where a registered Graduate Engineer undergoes a mentorship programme and passes engineering qualifying examinations.

2. Purpose of these guidelines

The purpose of these guidelines is to ensure consistency in how Engineering Qualifying Examinations are conducted.

3. Purpose of the Engineering Qualifying Examinations

The purpose of the Engineering Qualifying Examination is to ascertain that candidates have by practice and experience learnt to apply academically-acquired knowledge in solving practical problems. In this regard, candidates are expected to competently demonstrate that they:

- (a) Have acquired working knowledge of theoretical principles and gained practical experience in the planning, design, construction (installation), operation and maintenance of engineering works;
- (b) Have broadened their theoretical training since graduation and/or have kept up-to-date with new technological developments;
- (c) Are reasonably familiar with economic, social, legal and environmental aspects of the engineering work in which they have been involved;
- (d) Have acquired or learnt the art of logical thinking in matters related to engineering and of expressing their ideas and thoughts both orally and in writing in a manner that is easily and clearly understandable by other people;

- (e) Have the ability to present engineering ideas, designs, instructions or principles in neat and tidy graphical form by way of sketches, diagrams or drawings; and
- (f) Are aware of management techniques and principles of costing, programming, co-ordination of activities, resource planning, insurance and the like.

4. The Examiners

- 4.1 Upon receipt of candidate's documents, the ERC will appoint an examination panel comprising three Professional Engineers to test each candidate. The examiners should have actively practiced engineering for at least 5 years after becoming Professional Engineers.
- 4.2 The engineers so appointed shall represent the ERC but need not necessarily be ERC Members nor MEI Board Members.
- 4.3 One Member of each examination panel will normally be an engineer practicing in the same discipline as the candidate.
- 4.4 The mentor of the candidate shall be another member of the examination panel.
- 4.5 One member of the examination panel will be nominated as the First Member and should any candidate be directed by the Registrar to communicate with the panel this should be done through the First Member.

5. Documents submitted by the Candidate

The Registrar shall pass on to the examination panel the following documents submitted by the candidate:

- (a) Completed Training Record on ERC's standard form duly signed by the Candidate and his/her Registered Mentor;
- (b) Certificate of Completion of Training on ERC's standard form duly signed by the Candidate and his/her Registered Mentor
- (c) A report written by the Candidate on his/her engineering experience to date. The report must be in typescript of not less than 1,000 words nor exceeding 2,000 words in length.
- (d) Technical submission which could be an engineering design or technical treatise, manual or report or any other document illustrating the application of engineering principles to an engineering undertaking, project or investigation. The document must be the Candidate's own work or in a situation in which he has participated in its preparation, his own contribution to it must be clearly indicated. Projects undertaken at undergraduate level are not acceptable for this purpose.
- (e) One set of design drawings, charts, diagrams or other form of graphical representation of engineering development prepared by the Candidate during the course of his/her employment or post-graduate training. Wherever possible the

drawings, charts, diagrams, etc., should relate to or form part of the document submitted under section (d) above.

- (f) Any other documents which may include bills of quantities, specifications, photographs, etc., which relate to the Candidate's experience.
- (g) A letter addressed to the ERC and signed by a Professional Engineer registered with MEI confirming that the work submitted under (d) and (e) are a result of the original work undertaken by the Candidate or a reproduction of it.

6. The Qualifying Examination

- 6.1 The time and place for the Engineering Qualifying Examination shall be arranged by the First Member of the panel and advised to the Candidate directly or through the Registrar.
- 6.2 The Engineering Qualifying Examination shall consist of three parts as follows:
 - (a) Oral interview
 - (b) Written essay
 - (c) Written answers to design-oriented, analytical or technical questions requiring mathematical calculations for their solution.
- 6.3 The interview shall consist of oral questions asked by the Examiners on pre-prepared topics put to the candidate and answered orally by him. The questions will relate to the Candidate's experience and documents submitted under section 5 above, and to any other topic in which the Examiners consider that the Candidate should possess engineering knowledge. The candidate will be supplied with pencil and paper to enable him to illustrate his answers with sketches if necessary. Such sketches will be retained and submitted to the ERC as a record of the Candidate's performance.
- 6.4 The object of the essay section of the examination is to test the ability of the Candidate to write clearly on a technical subject or subjects within a set period. In this regard, a candidate will be asked to write not less than 1, 500 words on one or more topics in a three-hour period as decided by the Examiners. A choice of questions will be based on the candidate's experience. Paper for the essay(s) will be provided by the Registrar, and illustrations or explanation by means of diagrams or sketches is permitted. Reference to textbooks is not allowed.
- 6.5 The written essay section will be held on the same day as the oral interview or on the day following.
- 6.6 Candidates who might have submitted documents containing insufficient technical content under section 5 above will have to sit for technical question examination.

- 6.7 The technical question examination will be arranged to take place within one week of the oral interview, and will involve calculated and written answers to one from two alternative questions or two from three alternative questions. The use of calculators, reference books, drawing instruments, French curves and other aids provided by the candidate will be permitted. Questions will be related to academic training undergone by the candidate. However, candidates are not expected to have memorized complex mathematical or other formulae hence should be permitted to supply and to refer to textbooks during technical question examination.
- 6.8 Time allowed for oral examination will be 1.5 hours, essay writing 3 hours and technical question 3 hours.
- 6.9 The Examination Panel will arrange a time and venue for the technical question paper and advise the candidate. The Registrar will arrange for the provision of suitable paper for the written answers and graph paper, if necessary.

7. Questions for the Examinations

The Examiners shall ask questions that will assist them to assess all the parameters outlined in Section 3. The questions shall be set not earlier than two hours before the examination time.

8. Exemptions

At the discretion of the Examination Panel;

- 8.1 A candidate, who under Section 5, might have submitted documents that include authoritative reports such as PhD thesis on practical engineering work, or in cases where candidates have previously satisfied the ERC in regard to the written essay, may be exempted from written essay examination;
- 8.2 A candidate submitting documents containing sufficient technical content under Section 5 such as detailed design calculations may be exempted from sitting the technical question examination; and
- 8.3 The Examination Panel shall submit to the ERC a written justification why a candidate was exempted from a written essay examination and/or technical examination question. If the justification is not convincing, the ERC may order that the candidate should sit for the exempted examination(s).

9. Assessment of the submitted documents and provided answers

Examiners will score the documents and answers provided by a candidate numerically. The scores will be out of 100 points. The examiners will score the documents and answers individually and an average score will then be worked out. Where there is a

big variation amongst individual scores, examiners will discuss their observations and re-score the documents and the answers. An average score, will then be re-worked out.

9.1 Submitted documents

- a. The Examiners will check and confirm that all the documents listed in Section 5 have been submitted by the candidate. The Engineering Qualifying Examination will not proceed where one or more documents have not been submitted;
- b. The documents submitted under Section 5 (except (b) and (g)) will be assessed in terms of their technical correctness, inclusion of all necessary information and presentation (flow of ideas).
 - i. The documents whose score will be less than 50% will be rejected. The Engineering Qualifying Examination will be cancelled and the candidate will be asked to resubmit the affected documents within 3 months.
 - ii. Where deficiencies have been observed in the submitted documents (whose score is above 50% but less than 70%), the examiners shall ask the candidate questions to ascertain whether or not the candidate has sufficient knowledge in the areas where deficiencies have been observed through oral questions, written essay or technical questions.
- c. An average score for all the documents assessed under (b) will be worked out.

9.2 Oral questions

The examiners should ask the candidates at least 6 listed questions. In addition to the listed questions, as many random questions should be asked. Each listed question together with follow-up random questions should be scored out of 100 points. An average score for all the questions should be determined.

9.3 Essay Questions

Written essay answers should be assessed in terms of their technical correctness, inclusion of all necessary information and presentation (flow of ideas). An average score should be determined out of 100 points.

9.4 Technical Questions

Answers to technical questions should be assessed in terms of their technical correctness, reference to codes of practice (or similar documents) and presentation (flow of ideas). An average score should be determined out of 100 points.

10. Recommendation to the ERC

- 10.1 The pass mark for the Engineering Qualifying Examination is an average of 75%. In this regard, an average score for the submitted documents, oral questions, written essay and technical questions shall be worked out;
- 10.2 A candidate who scores more than 65% in each of the examinations (submitted documents, oral questions, written essay and technical questions) and an average of 75% and above shall be recommended for registration as a Professional Engineer;
- 10.3 For a candidate who scores more than 65% in each of the examinations (submitted documents, oral questions, written essay and technical questions) but has an average score of less than 75%, the Examination Panel shall disclose the results to the candidate and ask him/her to re-sit the part(s) where he or she has scored the lowest to improve his/her average score. The candidate will re-sit the affected part(s) of the examination within 1 month. The candidate shall be recommended for registration as a Professional Engineer if his average score improves to 75% or more.

If the candidate does not re-take the affected part(s) of the examination within 2 months, or the average score remains less than 75% after re-taking the affected part(s) of the examination, all the scores will be forfeited and the candidate will have to start the process of the Engineering Qualifying Examinations all over again;

- 10.4 A candidate who scores less than 65% in one or more of the examinations (submitted documents, oral questions, written essay and technical questions) shall be asked to re-sit that part(s) of the Engineering Qualifying Examinations within 3 months. If the candidate does not re-take the affected part(s) of the examination within 6 months, all the scores will be forfeited and the candidate will have to start the process of the Engineering Qualifying Examinations all over again; and
- 10.5 A candidate who fails the Engineering Qualifying Examinations shall apply for another examination not earlier than 12 months from the date of the last examinations.

11. Examination Results Report

- 11.1 The examination panel shall prepare and submit to the ERC examination results using the relevant form. The results shall be submitted within 7 days from the date of the last part of the examinations;
- 11.2 All Panel Members shall sign the examination results form;

- 11.3 Panel Members who do not agree with the results shall also sign the report clearly indicating that they do not agree with the results and citing the reasons;
- 11.4 The ERC shall investigate why some of the Panel Members do not agree with the results and order that either:
 - a. The existing Panel Members should discuss and resolve their differences, and finalize the examinations;
 - b. Some Panel Members should be replaced and the examinations finalized;
 - c. A new examination panel be formed to review and finalize the examinations;
or
 - d. A new examination panel be formed to conduct fresh examinations.

12. Confidentiality

- 12.1 Panel Members are not authorized to answer any questions or to impart any information that might unfairly assist any candidate in preparing for the Qualifying Examination. Any candidate seeking such information may risk disqualification and could expose himself or herself to disciplinary action;
- 12.2 Panel Members are not authorized to divulge examination results to any person. After all, their examination results and recommendations are subject to confirmation, review or rejection by the ERC. Any request for information by a candidate concerning the results of an examination must be directed to the Registrar of the ERC;
- 12.3 A Panel Member found in breach of sections 12.1 and 12.2 will be referred to the Disciplinary Committee of MEI for appropriate action.