

SOUTH AFRICAN NATIONAL INSTITUTE OF ROCK MECHANICS

CHAMBER OF MINES OF SOUTH AFRICA
CERTIFICATE IN ROCK MECHANICS

PART 4

ROCK MECHANICS PRACTICAL (SURFACE AND UNDERGROUND)

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PREAMBLE

TOPIC COVERED

Although this practical examination syllabus is generic in nature, this is a specific mining type oral examination covering the practice of rock mechanics in the applicable mining environment

The rock engineering knowledge required here is thus of a specific nature, relating to the mining of orebodies as contemplated in the appropriate Part-3 written examination syllabus

CRITICAL OUTCOMES

The examination is aimed at testing the candidates abilities in the six cognitive levels of knowledge, comprehension, application, analysis, synthesis and evaluation
Thus, when being examined on the topics detailed in this syllabus candidates must demonstrate their capacity for:

- Comprehending and understanding the general rock engineering principles covered in this syllabus and applying these to solve real world mining problems
- Applying fundamental scientific knowledge, comprehension and understanding to predict the behaviour of rock materials in real world mining environments
- Performing creative procedural design and synthesis of mine layouts and support systems to control and influence rock behaviour and rock failure processes
- Using engineering methods and understanding of the uses of computer packages for the computation, modelling, simulation, and evaluation of mining layouts
- Communicating, explaining and discussing the reasoning, methodology, results and ramifications of all the above aspects in a professional manner at all levels

PRIOR LEARNING

This portion of the syllabus assumes that candidates have prior experience, learning and good understanding of:

- The field of fundamental mechanics and practical applied rock engineering appropriate to this part of the syllabus
- The application and manipulation of rock mechanics principles appropriate to this part of the syllabus as outlined in the relevant sections of this document and the appropriate written syllabi

- The application of formulae and criteria appropriate to this part of the syllabus as outlined in the relevant sections of this document and the appropriate written syllabi
- The terms, definitions and conventions appropriate to this part of the syllabus as outlined in the relevant sections of this document and the appropriate written exam syllabi.

STUDY MATERIAL

This portion of the syllabus assumes that candidates have studied widely and have good knowledge and understanding of:

- The reference material appropriate to this part of the syllabus as outlined in the relevant sections of this document as well as in the equivalent written examination syllabi
- Other texts that are appropriate to this part of the syllabus but that may not be specifically referenced in this document or in the equivalent written examination syllabi
- Information appropriate to this part of the syllabus published in journals, proceedings and documents of local mining, technical and research organisations

SYLLABUS

2 GEOTECHNICAL CHARACTERISTICS

2.1 GEOLOGY

2.2 IDENTIFY GEOLOGY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ stratigraphy and its geotechnical impact

2.2.1 IDENTIFY STRUCTURE

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ geological and rockmass structures, their causes and their geotechnical impact

2.2.2 INTERPRET STRUCTURE EFFECTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ geological and rockmass structure effects, their causes and their geotechnical impact

2.3 ROCK STRENGTH

2.3.1 DETERMINE ROCK STRENGTH

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Estimate and otherwise determine in-situ rock and rockmass strength and its geotechnical impact

2.3.2 INTERPRET ROCK STRENGTH EFFECTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ rock and rockmass strength effects, their causes and their geotechnical impact

1.3 ROCKMASS CHARACTERISTICS

2.3.3 DETERMINE GEOTECHNICAL ROCKMASS CLASSIFICATION

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Estimate and otherwise determine in-situ rockmass classification, its causes and its geotechnical impact

3 ROCK AND ROCKMASS BEHAVIOUR

3.1 ROCKMASS BEHAVIOUR IN AND AROUND OREBODY EXCAVATIONS

3.1.1 IDENTIFY CONDITIONS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ rockmass and excavation behaviour and conditions in and around orebody excavations, their causes and their geotechnical impact

3.1.2 INTERPRET STABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ rockmass and excavation stability in and around orebody excavations, its causes and its geotechnical impact

3.1.3 RECOMMEND REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative strategies to address excavation instability and adverse rockmass behaviour in and around orebody excavations

3.2 ROCKMASS BEHAVIOUR IN AND AROUND SERVICE EXCAVATIONS

3.2.1 IDENTIFY CONDITIONS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ rockmass and excavation behaviour and conditions in and around service excavations, their causes and their geotechnical impact

3.2.2 INTERPRET STABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ rockmass and excavation stability in and around service excavations, its causes and its geotechnical impact

3.2.3 RECOMMEND REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative strategies to address excavation instability and adverse rockmass behaviour in and around service excavations

3.3 MINE SEISMICITY

3.3.1 IDENTIFY CONDITIONS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ rockburst and potential rockburst behaviour and conditions in and around mining excavations, their causes and their geotechnical impact

3.3.2 INTERPRET STABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ rockmass and excavation seismic stability in and around mining excavations, its causes and its geotechnical impact

3.3.3 RECOMMEND REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative strategies to address seismic instability in and around mining excavations

3.4 INTERPRET GEOTECHNICAL ROCKMASS CLASSIFICATION EFFECTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate in-situ rockmass classification effects, their causes and their geotechnical impact

4 MINING LAYOUTS AND MINING LAYOUT DESIGN

4.1 MINING METHODS

4.1.1 INTERPRET MINE PLANS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate mining and rock engineering issues on mine plans, sections and other representations, their causes and their geotechnical impact

4.1.2 IDENTIFY MINING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate mining methods and rock engineering strategies, their mining ramifications and their geotechnical impact

4.1.3 DESCRIBE MINING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate mining methods and rock engineering strategies, their mining ramifications and their geotechnical impact

4.1.4 INTERPRET APPLICABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate the applicability of mining methods and rock engineering strategies, their mining ramifications and their geotechnical impact

4.1.5 RECOMMEND REMEDIES / ALTERNATIVES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative mining methods to address inappropriate mining methods and/or rock engineering strategies, their mining ramifications and their geotechnical impact

4.2 REGIONAL STABILITY

4.2.1 IDENTIFY CONDITIONS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate regional mining conditions and rock engineering strategies, their mining ramifications and their geotechnical impact

4.2.2 INTERPRET STABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate regional mining and rock engineering stability issues, their mining ramifications and their geotechnical impact

4.2.3 RECOMMEND REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative strategies to address inappropriate or inadequate regional stability strategies, their mining ramifications and their geotechnical impact

4.3 MINING LAYOUTS

4.3.1 IDENTIFY CONDITIONS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate mining and rock engineering layouts and conditions, their mining ramifications and their geotechnical impact

4.3.2 INTERPRET STABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate mining and rock engineering stability issues, their mining ramifications and their geotechnical impact

4.3.3 RECOMMEND REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative strategies to address inappropriate or inadequate mining layouts, their mining ramifications and their geotechnical impact

4.4 SERVICE EXCAVATION LAYOUTS

4.4.2 IDENTIFY CONDITIONS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate service excavation layouts and conditions, their mining ramifications and their geotechnical impact

4.4.3 INTERPRET STABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate service excavation stability issues, their mining ramifications and their geotechnical impact

4.4.4 RECOMMEND REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative strategies to address inappropriate or inadequate service excavation layouts, their mining ramifications and their geotechnical impact

4.5 LAYOUT DESIGN CRITERIA

4.5.1 IDENTIFY CRITERIA

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate layout design criteria, their mining ramifications and their geotechnical impact

4.5.2 DESCRIBE CRITERIA

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate layout design criteria, their mining ramifications and their geotechnical impact

4.5.3 INTERPRET APPLICABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate the applicability of layout design criteria in given sets of circumstances, their mining ramifications and their geotechnical impact

4.5.4 RECOMMEND ALTERNATIVES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative layout design criteria to address inappropriate or inadequate layouts, their mining ramifications and their geotechnical impact

5 MINING SUPPORT AND MINING SUPPORT DESIGN

5.1 MINING SUPPORT

5.1.1 IDENTIFY SUPPORT METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate mining support methods and strategies, their mining ramifications and their geotechnical impact

5.1.2 DESCRIBE SUPPORT METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate mining support methods and strategies, their mining ramifications and their geotechnical impact

4.1.3 INTERPRET SUPPORT APPLICABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate the applicability of mining support methods and strategies, their mining ramifications and their geotechnical impact

4.1.4 APPRAISE SUPPORT QUALITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Appraise and critically interpret and evaluate the quality of mining support materials and installation procedures, their mining ramifications and their geotechnical impact

4.1.5 RECOMMEND REMEDIES / ALTERNATIVES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative mining support methods to address inappropriate mining support methods and/or strategies, their mining ramifications and their geotechnical impact

4.2 SERVICE EXCAVATION SUPPORT

4.2.1 IDENTIFY SUPPORT METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate service excavation support methods and strategies, their mining ramifications and their geotechnical impact

4.2.2 DESCRIBE SUPPORT METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate service excavation support methods and strategies, their mining ramifications and their geotechnical impact

4.2.3 INTERPRET SUPPORT APPLICABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate the applicability of service excavation support and strategies, their mining ramifications and their geotechnical impact

4.2.4 APPRAISE SUPPORT QUALITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Appraise and critically interpret and evaluate the quality of service excavation support materials and installation procedures, their mining ramifications and their geotechnical impact

4.2.5 RECOMMEND REMEDIES / ALTERNATIVES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative service excavation support methods to address inappropriate mining support methods and/or strategies, their mining ramifications and their geotechnical impact

4.3 SUPPORT DESIGN CRITERIA

4.3.1 IDENTIFY CRITERIA

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate support design criteria, their mining ramifications and their geotechnical impact

4.3.2 DESCRIBE CRITERIA

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate support design criteria, their mining ramifications and their geotechnical impact

4.3.3 INTERPRET APPLICABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate the applicability of support design criteria in given sets of circumstances, their mining ramifications and their geotechnical impact

4.3.4 RECOMMEND ALTERNATIVES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative support design criteria to address inappropriate or inadequate support, their mining ramifications and their geotechnical impact

4.4 SUPPORT AND SUPPORT SYSTEM TYPES AND CHARACTERISTICS

4.4.1 IDENTIFY SUPPORT AND SUPPORT SYSTEM ELEMENTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically evaluate support and support system elements, their design and their construction, and their mining ramifications and their geotechnical impact

4.4.2 DESCRIBE SUPPORT AND SUPPORT SYSTEM ELEMENTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically evaluate support and support system elements, their design and construction, and their mining ramifications and their geotechnical impact

4.4.3 DESCRIBE PERFORMANCE CHARACTERISTICS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate support element and support system performance characteristics, their mining ramifications and their geotechnical impact

4.4.4 INTERPRET APPLICABILITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Identify and critically interpret and evaluate the applicability of support elements and support systems in given sets of circumstances, their mining ramifications and their geotechnical impact

4.4.5 RECOMMEND ALTERNATIVES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative support elements and/or support systems to address inappropriate or inadequate support, their mining ramifications and their geotechnical impact

6 INVESTIGATION, EVALUATION AND MONITORING

6.1 ROCK TESTING

6.1.1 DESCRIBE ROCK TESTING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate rock testing methods and strategies, sampling procedures, sample preparation, test procedures and outcome interpretation

6.1.2 DESCRIBE THE APPLICATION OF ROCK TESTING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate the applicability of rock testing methods and strategies, sampling procedures, sample preparation and test procedures

6.1.3 DESCRIBE THE APPLICATION OF ROCK TEST RESULTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate the applicability of rock test outcomes and results, their mining ramifications and their geotechnical impact

6.1.4 PERFORM TESTS FOR ROCK SAMPLE CHARACTERISTICS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Conduct rock tests and critically interpret and evaluate the outcomes and results to determine rock sample characteristics

6.1.5 INTERPRET ROCK TEST RESULTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate rock test outcomes and results, their mining ramifications and their geotechnical impact

6.2 ROCKMASS CHARACTERISATION / CLASSIFICATION

6.2.1 DESCRIBE ROCKMASS CLASSIFICATION SCHEMES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate rockmass classification schemes, their mining ramifications and their geotechnical impact

6.2.2 DESCRIBE ROCKMASS CLASSIFICATION METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate rockmass classification methods, data gathering procedures, data processing procedures and outcomes

6.2.3 DESCRIBE THE APPLICATION OF ROCKMASS CLASSIFICATION METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate the applicability of rockmass classification methods, schemes and strategies, their mining ramifications and their geotechnical impact

6.2.4 DESCRIBE THE APPLICATION OF ROCKMASS CLASSIFICATION RESULTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate the applicability of rockmass classification outcomes and results, their mining ramifications and their geotechnical impact

6.2.5 PERFORM ROCKMASS CLASSIFICATION INVESTIGATIONS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Conduct rockmass classification investigations and determinations, and critically interpret and evaluate the outcomes and results to determine rockmass characteristics and classification

6.2.6 INTERPRET ROCKMASS CLASSIFICATION RESULTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate rockmass classification determinations, outcomes and results, their mining ramifications and their geotechnical impact

6.3 MONITORING

6.3.1 DESCRIBE ROCK MONITORING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate rock monitoring methods, instrumentation deployment schemes, data gathering procedures, data processing procedures and outcomes

6.3.2 DESCRIBE THE APPLICATION OF ROCK MONITORING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate the applicability of rock monitoring methods, procedures and results, their mining ramifications and their geotechnical impact

6.3.3 RECORD ROCK MONITORING MEASUREMENTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Conduct rock monitoring investigations and determinations, and critically interpret and evaluate the outcomes and results to determine rockmass deformations, their mining ramifications and their geotechnical impact

6.3.4 INTERPRET ROCK MONITORING MEASUREMENTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate rock monitoring outcomes and results to determine rockmass deformations, their mining ramifications and their geotechnical impact

6.4 MODELLING

6.4.1 DESCRIBE NUMERICAL MODELLING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate numerical modelling methods, deployment schemes, data gathering procedures, data processing procedures and outcomes

6.4.2 DESCRIBE THE APPLICATION OF NUMERICAL MODELLING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate the applicability of numerical modelling methods, procedures and results, their mining ramifications and their geotechnical impact

6.4.3 APPLY NUMERICAL MODELLING METHODS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Conduct numerical modelling investigations and determinations, and critically interpret and evaluate the outcomes and results to determine rockmass and/or excavation stability, their mining ramifications and their geotechnical impact

6.4.4 INTERPRET NUMERICAL MODELLING RESULTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate numerical modelling outcomes and results, their mining ramifications and their geotechnical impact

7 DRILLING, BLASTING AND ROCKBREAKING

7.1 CUTTING TECHNIQUES

7.1.1 APPRAISE CUTTING QUALITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Appraise and critically interpret and evaluate the quality of rock cutting procedures and strategies, their mining ramifications and their geotechnical impact

7.1.2 RECOMMEND CUTTING REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative rock cutting methods, procedures and strategies to address inappropriate rock cutting procedures, their mining ramifications and their geotechnical impact

7.2 DRILLING TECHNIQUES

7.2.1 APPRAISE DRILLING QUALITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Appraise and critically interpret and evaluate the quality of drilling procedures and strategies, their mining ramifications and their geotechnical impact

7.2.2 RECOMMEND DRILLING REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative drilling methods, procedures and strategies to address inappropriate rock drilling procedures, their mining ramifications and their geotechnical impact

7.3 BLASTING PRACTICES

7.3.1 APPRAISE BLASTING QUALITY

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Appraise and critically interpret and evaluate the quality of blasting practices, procedures and strategies, their mining ramifications and their geotechnical impact

7.3.2 RECOMMEND REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative blasting practices, procedures and strategies to address inappropriate blasting procedures, their mining ramifications and their geotechnical impact

8 SURFACE EFFECTS AND ENVIRONMENTAL IMPACTS

8.1 SURFACE EFFECTS

8.1.1 DESCRIBE AND INTERPRET SURFACE EFFECTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate mining surface effects, their causes, prediction, measurement and monitoring, and their ramifications

8.1.2 RECOMMEND SURFACE EFFECT REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative mining strategies to address inappropriate or unacceptable mining surface effects and their ramifications

8.2 ENVIRONMENTAL IMPACTS

8.2.1 DESCRIBE ENVIRONMENTAL IMPACTS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and critically interpret and evaluate mining environmental impacts, their causes, prediction, measurement and monitoring, and their ramifications

8.2.2 RECOMMEND ENVIRONMENTAL IMPACT REMEDIES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend remedies and/or alternative mining strategies to address inappropriate or unacceptable mining environmental impacts and their ramifications

9 MINING STRATEGIES IN DIFFICULT CIRCUMSTANCES

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Recommend, describe and evaluate mining and/or rock engineering strategies and solutions to address mining method, excavation stability and rockmass behaviour challenges in difficult, extraordinary and/or unusual situations or circumstances

10 LEGAL COMPLIANCE

10.1 THE ACT AND REGULATIONS

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and evaluate the impact and influence of the Act and Regulations on practical mining operations and/or rock engineering strategies

10.2 CODE OF PRACTICE GUIDELINE

The candidate must be able to demonstrate knowledge and understanding of the above subject area by being able to:

- Describe and evaluate the impact and influence of the Code of Practice Guideline and Codes of Practice on practical mining operations and/or rock engineering strategies