

Sep 2023

Examiners' report

Electrical engineering manager of underground coal mines certificate of competence

Examiners' report 2023

Written examination

CEE1 – Electrical engineering applied to coal mines

Summary of results and general comments

Exam date: 13 September 2023

Number of candidates: 3

Number passed: 2

Highest mark: 89.2%

Average mark: 73.1%

Lowest mark: 54.2%

Marking criteria: A candidate must get 36 out of 60 (60%) to pass the exam and pass all essential questions.

Candidates who passed this exam demonstrated a good knowledge of Electrical Engineering practices and standards.

Question 1 (total of 10 marks) Earthing

Highest mark: 8.5

Average mark: 6.7

Lowest mark: 5.5

Examiners' comments:

Essential question. Candidates must get at least 6 out of 10 marks on this question to pass this question.

Most candidates demonstrated adequate knowledge of Australian Standards and Legislative requirements relating to Earthing systems at mine sites.

Some candidates lacked an understanding of Earth potential rise under fault conditions & the risks associated with the insulation testing of XLPE cables.

Question 2 (total of 10 marks) Lightning

Highest mark: 9

Average mark: 7

Lowest mark: 4

Examiners' comments:

This question was answered well by most candidates. Some candidates demonstrated a knowledge of Australian Standard requirements for lightning earth grid segregation but were not able to provide practical examples of how this could be achieved.

Question 3 (total of 10 marks) Powered Winding Systems

Highest mark: 10

Average mark: 8.2

Lowest mark: 7

Examiners' comments:

This question was answered competently by all candidates. Candidates were able to identify relevant legislative requirements and demonstrate knowledge of the Winder TRG's.

Question 4 (total of 10 marks) Protection

Highest mark: 8

Average mark: 6.7

Lowest mark: 5

Examiners' comments:

Essential question. Candidates must get at least 7 out of 10 marks on this question to pass this question.

Calculations were completed adequately by most candidates.

Some candidates struggled with the following:

- Applying adequate derating factors to calculated values when selecting protection settings.
- Identifying minimum design ratings for equipment based off calculated values.

Question 5 (total of 10 marks) Arc Flash

Highest mark: 10

Average mark: 8.3

Lowest mark: 5

Examiners' comments:

This question was answered adequately by some candidates. Not all candidates demonstrated a knowledge of the impacts of impedance on fault levels.

Question 6 (total of 10 marks) Power Calculations

Highest mark: 8

Average mark: 7

Lowest mark: 6

Examiners' comments:

Generally answered well by candidates. However, candidates struggled with the vector diagram portion of the question.

CEE2 – Legislation and Australian Standards applicable to underground mines

Summary of results and general comments

Exam date: 13 September 2023

Number of candidates: 3

Number passed: 1

Highest mark: 74.6%

Average mark: 60.7%

Lowest mark: 52.1%

Marking criteria: A candidate must get 72 out of 120 (60%) to pass the exam and pass the essential questions.

Only 1 candidate passed this exam. Candidates are required to have a good knowledge of electrical legislation & standards.

Question 1 (total of 10 marks) ASNZS 2081

Highest mark: 8

Average mark: 6.7

Lowest mark: 5

Examiners' comments:

This question was generally answered well by candidates.

Some candidates were unable to identify the cable damage curve on the TCC.

Also, candidates struggled with the definition of Earth leakage current.

Question 2 (total of 10 marks) EX 'e' Increased safety

Highest mark: 9

Average mark: 6

Lowest mark: 4

Examiners' comments:

One candidate demonstrated a high level of knowledge about Exe equipment.

Other candidates struggled with identifying applications where Exe equipment is commonly found & AS2290.1 maintenance requirements.

Question 3 (total of 10 marks) Exemptions & functional safety

Highest mark: 8.5

Average mark: 5.3

Lowest mark: 2.5

Examiners' comments:

Knowledge of the legislated Explosion Protection requirements and exemption applications varied greatly between candidates.

Some candidates struggled with:

- Identifying whether Ex equipment was suitable for use in the designated zone.
- Identifying which section of the WHS (M&PS) Regulation an exemption would be required for.
- Understanding of the basis and requirements for applying for an exemption.

Question 4 (total of 10 marks) Power transformer and oil sampling

Highest mark: 9

Average mark: 6.7

Lowest mark: 5

Examiners' comments:

All candidates demonstrated a basic level of understanding of transformer oil sampling.

However, some candidates had a limited understanding of Buchholz protection & Furan analysis.

Question 5 (total of 10 marks) AS/NZS3800

Highest mark: 9

Average mark: 6.8

Lowest mark: 4.5

Examiners' comments:

Essential question. Candidates must get at least 6 out of 10 marks on this question to pass this question.

Some candidates struggled with pressure testing requirements for Exd enclosures.

Question 6 (total of 10 marks) Use of plant in hazardous zone

Highest mark: 9.5

Average mark: 7

Lowest mark: 3

Examiners' comments:

Essential question. Candidate must get at least 6 out of 10 marks on this question to pass this question.

Candidates are expected to be familiar with Section 81 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2022.

Question 7 (total of 10 marks) Multiple Choice Question

Highest mark: 10

Average mark: 8.7

Lowest mark: 8

Examiners' comments:

This question was answered well by all candidates.

Question 8 (total of 10 marks) WHS(M&Ps) Reg 2022

Highest mark: 8.5

Average mark: 7.2

Lowest mark: 6.5

Examiners' comments:

All candidates demonstrated an acceptable level of knowledge about PHMP's.

Question 9 (total of 10 marks) WHS Act – Consultation

Highest mark: 6

Average mark: 4

Lowest mark: 2

Examiners' comments:

This question was answered poorly by all candidates. Consultation is an important function carried out by the EEM, as such requirements outlined in the WHS Act need to be understood.

Question 10 (total of 10 marks) WHS Act – Duty

Highest mark: 5.5

Average mark: 4.5

Lowest mark: 2.5

Examiners' comments:

Primary Duty of Care was poorly understood by candidates.

Question 11 (total of 10 marks) Introduction to site

Highest mark: 6

Average mark: 5.3

Lowest mark: 4.5

Examiners' comments:

Candidates must read the question carefully as all candidates overlooked the fact that parts D & E were specific to 'Mobile Plant'.

Question 12 (total of 10 marks) Switchboards

Highest mark: 6

Average mark: 4.7

Lowest mark: 3.5

Examiners' comments:

Candidates struggled with Switchboard 'Form' ratings.

Oral examination

Date: 29 November 2023

Number of candidates: 2

Number deemed competent: 2

Examiners' comments:

Both candidates were successful.

Question 1 related to an Arc Fault Incident on a conveyor starter panel and evaluated:

- Incident Management
- Knowledge of legislative incident notification requirements
- Investigation process
- Long term actions and management relevant to the incident.

Question 2 related to life cycle management of Earthing Systems and incorporated:

- Different earthing system configurations
- Risk Management
- Knowledge of Legislation & Australian standards relevant to Earthing Systems.

Question 3 related to an incident on a Longwall Face incorporating:

- Unplanned movements
- Notification arrangements
- Immediate incident management
- Hierarchy of controls.

Both candidates answered the questions competently and appear to have benefitted from utilising a structured approach to problem-solving & risk evaluation.

Post Oral examination

Date: 22 May 2024

Number of candidates: 0

More information

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Acknowledgments

Electrical engineering manager of underground coal mines examination panel

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