

March 2024

Examiners' report

Mechanical engineering manager of underground coal mines certificate of competence

Examiners' Report 2023-2024

Written examination

CME1- Mechanical engineering applicable to underground coal mines

Summary of results and general comments

Exam date: 9 August 2023

Number of candidates: 7

Number passed: 7

Highest mark: 85%

Average mark: 68%

Lowest mark: 62%

The results were satisfactory, but the candidates did not perform well on question 8 regarding the haul truck front strut, and poorly on question 10 regarding mechanical fundamentals.

Question 1 (total of 25 marks) Scenario

Highest mark: 25

Average mark: 21.3

Lowest mark: 16

Examiners' comments:

This question was answered competently. However, some candidates missed feedback to workers, and updating the planned maintenance and inspection program.

Question 2 (total of 25 marks) Conveyors

Highest mark: 23

Average mark: 17.6

Lowest mark: 14

Examiners' comments:

This question was answered competently.

Question 3 (total of 25 marks) Multiple choice and Acronyms

Highest mark: 24

Average mark: 20.6

Lowest mark: 17

Examiners' comments:

This question was answered competently. However, some candidates had difficulty with the winder questions.

Question 4 (total of 25 marks) Safety Bulletin – Lifting and crantage

Highest mark: 22.5

Average mark: 18.3

Lowest mark: 15.5

Examiners' comments:

This question was answered competently. However, some candidates lacked understanding of swing zones.

Question 5 (total of 25 marks) Drift sinking equipment

Highest mark: 23

Average mark: 17.4

Lowest mark: 14

Examiners' comments:

Essential elements question. Candidates must be deemed competent in the essential part of the question in order to be deemed competent in this question and the marks for this question to be counted. This question was answered competently. However, some candidates had difficulty identifying potential consequential effects when replacing aluminium slides with steel slides.

Question 6 (total of 25 marks) MECP - Energy

Highest mark: 25

Average mark: 21.1

Lowest mark: 15.5

Examiners' comments:

This question was answered competently.

Question 7 (total of 25 marks) Pumping system – Development panel dewatering

Highest mark: 20.5

Average mark: 15.6

Lowest mark: 10.5

Examiners' comments:

Candidates had difficulty with clear schematic symbols, including incorrect hydraulic symbols for the application.

Question 8 (total of 25 marks) Haul truck front suspension strut

Highest mark: 15.5

Average mark: 8.1

Lowest mark: 3

Examiners' comments:

This question was answered very poorly by most candidates. There was a lack of understanding of the task, specialist equipment involved, whether there was a requirement to depressurise the strut and remove the tyre. There was also a lack of understanding of applicable verification of controls.

Question 9 (total of 25 marks) Conveyor belts

Highest mark: 25

Average mark: 19.3

Lowest mark: 12

Examiners' comments:

Some candidates lacked understanding of conveyor belt testing requirements.

Question 10 (total of 25 marks) Mechanical fundamentals

Highest mark: 21

Average mark: 14.7

Lowest mark: 10

Examiners' comments:

Some candidates lacked understanding on conversion of units of measurement.

CME2 – Legislation and Australian Standards applicable to underground coal mines

Summary of results and general comments

Exam date: 9 August 2023

Number of candidates: 7

Number passed: 5

Highest mark: 81%

Average mark: 71%

Lowest mark: 64%

Two candidates were considered not yet competent for the essential question relating to the role of the Mechanical Engineering Manager, and the content of the Mechanical Engineering Control Plan (MECP). Consequently they were considered not yet competent for the exam.

Question 1 (total of 25 marks) Role of Mechanical Engineer and MECP

Highest mark: 25

Average mark: 20.9

Lowest mark: 11

Examiners' comments:

Essential question. Candidates must be deemed competent in this question in order to be deemed competent for the exam. Some candidates did not correctly identify legislation relating to the MECP.

Question 2 (total of 25 marks) Principal control plans

Highest mark: 21

Average mark: 16.4

Lowest mark: 9

Examiners' comments:

This question was answered competently. However, some candidates did not understand who can develop a MECP, or how to practically ensure a readily understandable document.

Question 3 (total of 25 marks) Mechanical engineering control plan

Highest mark: 25

Average mark: 24.6

Lowest mark: 23

Examiners' comments:

This question was answered competently.

Question 4 (total of 25 marks) Principal hazard management plans

Highest mark: 23.5

Average mark: 20.2

Lowest mark: 18

Examiners' comments:

This question was answered competently.

Question 5 (total of 25 marks) Management of risk

Highest mark: 21

Average mark: 11

Lowest mark: 5

Examiners' comments:

This question was answered very poorly. The majority of candidates had inadequate understanding of risk management requirements under legislation.

Question 6 (total of 25 marks) Mobile plant

Highest mark: 18

Average mark: 14.5

Lowest mark: 7.5

Examiners' comments:

Essential elements question. Candidates must be deemed competent in the essential part of the question in order to be deemed competent in this question and the marks for this question to be counted. Most candidates had a poor understanding of practical methods to ensure risk control measures for mobile plant remain effective.

Question 7 (total of 25 marks) Contractor management

Highest mark: 14

Average mark: 9.3

Lowest mark: 4

Examiners' comments:

This question was answered very poorly. The majority of candidates were too reliant on low level systems, such as procedures and the MECP, and did not understand the stakeholders involved in Contractor management.

Question 8 (total of 25 marks) Qualified mechanical tradespersons

Highest mark: 25

Average mark: 19.2

Lowest mark: 13

Examiners' comments:

Some candidates were not specific enough in qualification requirements.

Question 9 (total of 25 marks) Falls

Highest mark: 25

Average mark: 22.7

Lowest mark: 17

Examiners' comments:

This question was answered competently.

Question 10 (total of 25 marks) Gazette – Drift slope haulage winder rope

Highest mark: 22

Average mark: 18.7

Lowest mark: 17

Examiners' comments:

Some candidates lacked detailed knowledge of the practical inspections and tests required to determine a ropes condition relative to discard criteria.

Oral examination

Date: 10 October 2023

Number of candidates: 7

Number deemed competent: 2

Examiners' comments:

The successful candidates listened to the questions, leveraged off their knowledge and experience, and provided structured practical answers that addressed the issues as if they were already in the statutory role at the mine. Generally the reverse applied to the unsuccessful candidates.

Topic 1 - Incident management

Average: 65%

Examiners' comments:

Some candidates did not consider the health of all the workers, or efficiently delegate tasks to reduce the impact on the injured worker.

Few candidates looked closely at the bolter controls or questioned if there were signs of recent maintenance. Instead candidates focussed on worker behaviour and the possibility of defeated controls, rather than inspecting and testing the equipment to determine the root cause.

Topic 2 – Fire on mobile plant

Average: 55%

Examiners' comments:

This question was answered okay. However, the candidates lacked detailed understanding of the operation of fire suppression systems.

Topic 3 – Fall of object

Average: 55%

Examiners' comments:

Candidates did not review documents, gather sufficient information, or function test the equipment, in order to determine the root cause. They did not identify options for modification to solve the problem, or identify additional risk controls.

Topic 4 – Contractor fleet

Average: 60%

Examiners' comments:

Candidates did not consider management of change, missed key points, and did not practically resolve the issues.

Oral examination

Date: 13 March 2023

Number of candidates: 4

Number deemed competent: 1

Examiners' comments:

The majority of candidates lacked knowledge of how to manage the scenarios presented, required too much prompting, and did not gather sufficient information to make sound engineering decisions, or identify the root cause.

Candidates need to ensure their working knowledge and experience covers both the roles of Mechanical Engineering Managers for underground coal mines and Mechanical Engineer at surface coal operations.

Topic 1 - Incident management

Average: 70%

Examiners' comments:

Some candidates did not manage all energy sources prior to accessing the scene, and did not adequately manage all the personnel involved.

There was too much prompting, and some candidates did not identify applicable notification options.

Candidates did not gather enough information, or involve technical and OEM expertise, to determine the root cause.

Topic 2 – Fluid power standard of engineering practice (SEP)

Average: 61%

Examiners' comments:

Some candidates did not understand the process of using outputs from the Risk Assessment as inputs for the SEP. They required prompting to identify scope and controls, and although they could identify risk areas they struggled to identify the specific hazards.

Topic 3 – Unintended activation

Average: 63%

Examiners' comments:

Candidates did not gather sufficient information prior to notification of the event, and lacked knowledge of what information was required, and where to source it from, to determine the root cause and manage risk. Candidates require far too much prompting.

Topic 4 – Loss of steering

Average: 41%

Examiners' comments:

This question was answered poorly by most candidates. Some candidates did not assess risks prior to workers accessing the equipment for testing.

They lacked understanding of heavy mobile plant, what information should be available, and where to gather it from. Mechanical Engineering Managers for underground coal mines often manage large surface fleets, and can hold the position of Mechanical Engineer at surface coal operations. Candidates are expected to be familiar with plant and equipment operation and maintenance for both.

More information

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Acknowledgments

Mechanical engineering manager of underground coal mines examination panel

© State of New South Wales through Regional NSW 2023. The information contained in this publication is based on knowledge and understanding at the time of writing Aug 2023. However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Regional NSW or the user's independent adviser.

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