



Regional
NSW

CANDIDATE NUMBER: _____ (write in from your letter)

EXAMINATION: Mining engineering manager underground mines other than coal mines

EXAMINATION PAPER: MEM1 – (PART A)

Legislation knowledge

DATE: Wednesday 24 February 2021

EXAMINATION

BOOKLET

CANDIDATE NUMBER: _____ (write in from your letter)

| Question Number | Available mark | Mark | Marked by (full name) | Summary comments to justify, as necessary |
|-----------------|----------------|-----------|-----------------------|---|
| 1 | a | 1 | | |
| | b | 1 | | |
| | c | 1 | | |
| | d | 1 | | |
| | e | 1 | | |
| | f | 1 | | |
| | g | 1 | | |
| | h | 1 | | |
| | i | 1 | | |
| | j | 1 | | |
| | Total | 10 | | |
| 2 | a | 4 | | |
| | b | 6 | | |
| | Total | 10 | | |
| 3 | a | 5 | | |
| | b i) | 3 | | |
| | b ii) | 1 | | |
| | b iii) | 1 | | |
| | Total | 10 | | |
| 4 | a | 4 | | |
| | b | 1 | | |
| | c | 5 | | |
| | Total | 10 | | |

| | | | | |
|--------------|--------------|-----------|--|--------------------------|
| 5 | a | 6 | | |
| | b | 4 | | |
| | Total | 10 | | |
| 6 | Total | 10 | | |
| 7 | Total | 10 | | |
| PAPER | TOTAL | 70 | | <i>Marks checked by:</i> |



(MEM1)

*Work Health and Safety (Mines and Petroleum Sites) Act 2013
Work Health and Safety (Mines and Petroleum Sites) Regulation 2014*

EXAMINATION FOR CERTIFICATE OF COMPETENCE

Mining engineering manager of underground mines other than coal mines

MEM1 – (PART A)

Legislation knowledge

**Wednesday 24 February 2021
9:00am to 11:00am (120 min)**

Glendarra 2 Conference room, Tocal College

INSTRUCTIONS TO CANDIDATES

All questions are to be attempted

All questions are of equal value, but parts of questions may vary in value.

All answers are to be written in this booklet ONLY

Candidates must provide reference to all relevant legislation in their answers where applicable.

Note that some questions require answers related to hazards and control measures that are not specified in legislation but the answers should reflect the context of legislated requirements.

Unless otherwise stated all references to Act and Regulations are to the

Work Health and Safety Act 2011

Work Health and Safety Regulation 2017

Work Health and Safety (Mines and Petroleum Sites) Act 2013

Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

Explosives Act 2003

Explosives Regulation 2013

Explosives Australian Standard AS 2187

To gain a pass in this examination paper, candidates must receive a pass mark of 60 %.

ANSWER BOOKLET

- A HIGHLIGHTER ONLY (no pen/pencil etc) can be used in this part of the exam paper during reading time
- If you have a question raise your arm
- Answers are to be written in the allocated spaces within this booklet ONLY
- Answers must be written in pen, however, drawings may be completed in pencil
- This booklet is not to be altered in any way, pages are not to be added or removed

QUESTION 1

(10 marks)

Each multiple choice question has one answer. Circle the appropriate answer.

- a) What is the lowest specific wet bulb temperature at which legislation requires the mine operator to implement control measures to manage heat stress to workers? (1 mark)

- a) 27 deg Celsius
- b) 27.5 deg Celsius
- c) 29 deg Celsius
- d) 29.5 deg Celsius

/1

- b) What is the maximum permissible legislated respirable dust—exposure for an 8 hour shift? (1 mark)

- a) 3 milligrams per cubic metre of air
- b) 2.5 milligrams per cubic metre of air
- c) 1.5 milligrams per cubic metre of air
- d) 10 milligrams per cubic metre of air

/1

- c) What is the maximum permissible legislated inhalable dust—exposure for an 8 hour shift? (1 mark)

- a) 3 milligrams per cubic metre of air
- b) 2.5 milligrams per cubic metre of air
- c) 10 milligrams per cubic metre of air
- d) 15 milligrams per cubic metre of air

/1

- d) What is the max perm legislated diesel particulate—exposure for an 8 hour shift? (1 mark)

- a) 0.3 milligrams per cubic metre of air
- b) 0.5 milligrams per cubic metre of air
- c) 1.0 milligrams per cubic metre of air
- d) 0.1 milligrams per cubic metre of air

/1

- e) What is the legislated minimum distance from a magazine that rubbish can be stored? (1 mark)

- a) 4m
- b) 5m
- c) 10m
- d) 18m

/1

f) As per Work Health and Safety Regulation 2017 (*WHS Reg 2017*) scaffolding work means erecting, altering or dismantling a temporary structure that is or has been erected to support a platform and from which a person or object could fall more than ___ metres from the platform or the structure. (1 mark)

- a) 1.8m
- b) 2m
- c) 3.3m
- d) 4m

/1

g) What is the legislated minimum distance a vehicle can be from an underground detonator magazine? (1 mark)

- a) 6m
- b) 10m
- c) 12m
- d) 18m

/1

h) A mine's Principal Hazard Management Plan - Fire or Explosion needs is required to consider any material that has a flash point at or less than: (1 mark)

- a) 52.8 deg Celsius
- b) 55.5 deg Celsius
- c) 58.0 deg Celsius
- d) 61.0 deg Celsius

/1

i) According to the Work Health and Safety (Mines & Petroleum Sites) Act 2013 (*WHS (M&PS) Act 2013*) when does a mine **NOT** require a Mining Engineering Manager (MEM) be appointed? (1 mark)

- a) Conducting surface exploration
- b) When processing but not mining
- c) When rehabilitating
- d) None of the above

/1

j) A mine must appoint a statutory Electrical Engineer when the total connected electrical power at the mine is equal to or greater than: (1 mark)

- a) 10 megawatts
- b) 5 megawatts
- c) 1000 kilowatts
- d) 1000 ohms

/1

QUESTION 2

(10 marks)

- a) You have been asked to design a new underground magazine for the storage of both detonators and explosives. Sketch out a design for the magazine.

The design should include legislated angles from any active roadway, location of any barriers to prevent vehicle access, location of any return air regulator, the direction of closure for any gates, the legislated colour of walls, any mandated dimensions for storage bays and backs and any legislated minimum distances. The sketch does not need to be to scale.

(0.5 marks per correct answer, up to 4 marks)

| | |
|--|----|
| | /5 |
|--|----|

a) You have a graduate mining engineer who has just finished their underground time and will now be the ventilation engineer. **(5 marks)**

- i) What training will you provide them so they can effectively manage the mine's ventilation system in accordance with the mine's legislative responsibilities?
(3 marks)

| | |
|--|----|
| | /3 |
|--|----|

- ii) What datasets will you expect them to use to reconcile the ventilation system?
(1 mark)

| | |
|--|----|
| | /1 |
|--|----|

- iii) Production rates are set to increase with an extra 29t diesel loader and 2 x 50t diesel trucks being added to the fleet. The existing primary circuit is already designed to manage this increase in diesel power. What changes to the (VCP) will be required before the extra fleet is introduced to the mine? (1 mark)

| | |
|--|----|
| | /1 |
|--|----|

QUESTION 4 **(10 marks)**

The board has just given approval and funding to conduct a bankable feasibility study to mine a new orebody at the same operation discussed in question 3. The orebody abuts old workings where mining finished in approximately 1910. You have what the mine thinks are the complete survey records of the old mine, though no one is certain as to their accuracy. You have convened a risk assessment to determine how you will manage the risks old workings pose to worker health and safety.

- a) Which minimum of 4 skillsets would you include in the workers involved in any risk assessment to ensure appropriate persons have been used in the risk assessment? (4 marks)

| | |
|--|----|
| | /4 |
|--|----|

b) What is the principal hazard that old workings potentially pose to workers? (1 mark)

| | |
|--|----|
| | /1 |
|--|----|

c) What controls could you put in place to manage this hazard? (5 marks)

| | |
|--|----|
| | /5 |
|--|----|

BLANK PAPER TO WRITE ANSWERS THAT YOU COULD NOT FIT INTO THE SPACE PROVIDED – INDICATE QUESTION NUMBER AT START OF ANSWER

END OF PAPER



Regional
NSW

CANDIDATE NUMBER: _____ (write in from your letter)

EXAMINATION: MINING ENGINEERING MANAGER UNDERGROUND
MINES OTHER THAN COAL MINES

EXAMINATION PAPER: MEM2 – (PART B)

Legislation application

DATE: Wednesday 24 February 2021

EXAMINATION

BOOKLET

Marking Table

CANDIDATE NUMBER: _____ **(write in from your letter)**

| Question Number | Mark | Available mark | Mark | Marked by <i>Name</i> | Summary comments to justify, as necessary |
|-----------------|--------------|----------------|------|--------------------------|---|
| 1 | a | 2 | | | |
| | b | 5 | | | |
| | c | 8 | | | |
| | Total | 15 | | | |
| 2 | a i) | 4 | | | |
| | a ii) | 4 | | | |
| | b i) | 3 | | | |
| | b ii) | 4 | | | |
| | Total | 15 | | | |
| PAPER | TOTAL | 30 | | | <i>Marks checked by:</i> |



(MEM2)

Work Health and Safety (Mines and Petroleum Sites) Act 2013
Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

EXAMINATION FOR CERTIFICATE OF COMPETENCE

MINING ENGINEERING MANAGER of underground mines other than coal mines

MEM2 – (PART B)

Legislation application

Wednesday 24 February 2021
12:00pm to 1:00pm (60 min)

Glendarra 2 Conference room, Tocal College

INSTRUCTIONS TO CANDIDATES

All questions are to be attempted

All questions are of equal value, but parts of questions may vary in value.

All answers are to be written in this booklet **ONLY**

Candidates must provide reference to all relevant legislation in their answers

Unless otherwise stated all references to Act and Regulations are to the

Work Health and Safety Act 2011

Work Health and Safety Regulation 2017

Work Health and Safety (Mines and Petroleum Sites) Act 2013

Work Health and Safety (Mines and Petroleum Sites) Regulation 2014

Explosives Act 2003

Explosives Regulation 2013

Explosives Australian Standard AS 2187

To gain a pass in this examination paper, candidates must receive a pass mark of 60 %.

ANSWER BOOKLET

- A HIGHLIGHTER ONLY (no pen/pencil etc) can be used in this part of the exam paper during reading time
- If you have a question raise your arm
- Answers are to be written in the allocated spaces within this booklet ONLY
- Answers must be written in pen, however, drawings may be completed in pencil
- This booklet is not to be altered in any way, pages are not to be added or removed

QUESTION 1

(15 marks)

You are the Mining Engineering Eanager (MEM) of an underground non-coal mine and receive a phone call at 2:10 am to inform you that a jumbo offsider has walked into unsupported ground while carrying mesh and has been struck and killed by a rock weighing approximately 2 Tonnes. .

- a) What does the *WHS (M&PS) Act 2013 and Reg 2014* respectively require you to do immediately? (2 marks)

| | |
|--|----|
| | /2 |
|--|----|

- b) What would be your actions over the next 6 hours as the MEM beyond your answer to Q8a? (5 marks)

| | |
|--|----|
| | /5 |
|--|----|

QUESTION 2

(15 marks)

You are the MEM, holder of a sub level cave mine producing 4.5 Mt of ore annually. You have the time to review the mine’s Safety Management System (SMS). Legislation states that the SMS must describe the arrangements in place for the supervision required to protect workers and other persons at the mine or petroleum site from risks to their health and safety from work carried out at the mine or petroleum site.

a) Use dot points to outline, what you expect the SMS to state for shift supervisors and foreman and how they will supervise underground workers at the mine?

i) Shift supervisors

(1 mark each, up to 4 marks)

| | |
|--|----|
| | /4 |
|--|----|

ii) Foreman

(1 mark each, up to 4 marks)

| | |
|--|----|
| | /4 |
|--|----|

b) As MEM how will you hold your shift supervisors and foreman accountable for the safety management aspects of their roles?

i) Shift supervisors

(1 mark each, up to 3 marks)

| | |
|--|----|
| | /3 |
|--|----|

ii) Foreman

(1 mark each, up to 4 marks)

| | |
|--|----|
| | /4 |
|--|----|

END OF QUESTIONS

BLANK PAPER TO WRITE ANSWERS THAT YOU COULD NOT FIT INTO THE SPACE PROVIDED – INDICATE QUESTION NUMBER AT START OF ANSWER

END OF PAPER