Mining engineering manager of underground mines other than coal mines
Paper 1

Candidate no.: _____

Legislation to be assessed

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

- *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 2022*
- *Explosives Act 2003*
- *Explosives Regulation 2013*

Exam details

Region: New South Wales
Venue: NSW Resources Regulator - Maitland
Start date/time: Tuesday 25 March 2025 9:00am
End date/time: Tuesday 25 March 2025 12:40pm
Duration: 03:40

Instructions to candidates

- A HIGHLIGHTER ONLY (no pencil/pen) can be used during reading time
- All 9 (nine) questions are to be attempted
- 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
- Additional space is provided at the end of the paper. Please label which question the answer relates to.

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

Question Number		Mark	Available mark	Marked by *Name*	Summary comments to justify, as necessary
Part A - Legislation					
1			10		
	Subtotal		**10**		
2	A		1		
	B		1		
	C		1		
	D		1		
	E		1		
	F		1		
	G		1		
	H		1		
	I		1		
	J		1		
	Subtotal		**10**		
3	A		5		
	B		1		
	C		1		
	D		1		

Question Number		Mark	Available mark	Marked by *Name*	Summary comments to justify, as necessary
	E		1		
	F		1		
	Subtotal		**10**		
4	A		1		
	B		3		
	C		3		
	D		3		
	Subtotal		**10**		
5	A		5		
	B		5		
	Subtotal		**10**		
6	A		3		
	B		3		
	C		4		
	Subtotal		**10**		
7	A		2		
	B		5		
	C		1		
	D		2		
	Subtotal		**10**		
Part A - Legislation					
PAPER A TOTAL			**70**		*Marks checked by:*

Question Number		Mark	Available mark	Marked by *Name*	Summary comments to justify, as necessary
Part B - Legislation knowledge and application					
8	A		4		
	B		2		
	C		9		
	Subtotal		**15**		
9	A		1		
	B		2		
	C 1.		6		
	C 2.		6		
	Subtotal		**15**		*Marks checked by:*
Part B - Legislation knowledge and application					
PAPER B TOTAL			**30**		
PAPER TOTAL			**100**		*Marks checked by:*

Question 1

Part A - Legislation

Role of Mining Engineering Manager, Underground mine supervisor and Mining surveyor **(Total 10 marks)**

Fill in the blanks in the extract of legislation below regarding the role of the Mining Engineering Manager, Underground Mine Supervisor and Mining Surveyor.

Work Health and Safety (Mines and Petroleum Sites) Regulation

Schedule 10 Part 4 - Underground mines other than coal mines

25 Mining Engineering Manager

1) The statutory function of mining engineering manager is to _____, _____, _____ and _____ the mining engineering standards and procedures forming part of mining operations at the mine.

2) The requirement for nomination to exercise the statutory functions is that the individual nominated must hold a _____ that authorises the exercise of the statutory function.

26 Underground mine supervisor

1) The statutory function of underground mine supervisor is to _____ and _____ in a part of the mine for a shift during which production is taking place.

2) The requirement for nomination to exercise the statutory functions is that the individual nominated must hold a _____ that authorises the exercise of the statutory function.

27 Mining surveyor - only required if survey plan required

1) The statutory function of mining surveyor is to _____ and _____ the survey plan of the mine.

2) The requirement for nomination to exercise the statutory function is that the individual nominated must be a registered mining surveyor within the meaning of the _____.

Communication between outgoing and incoming shifts

Work Health and Safety (Mines and Petroleum Sites) Regulation 2022 - Section 31 - Communication between outgoing and incoming shifts

A) With regard to Section 31 what system must the operator of a mine site at which more than one shift is worked each day implement at the commencement of each shift?

Question 2

Total 10 Marks

A) What is the minimum distance that a person can smoke near a vehicle that - (a) contains an explosive, and (b) displays the signs required by the Australian Explosives Code? **(1 mark)**

A. 3 Meters
B. 5 Metres
C. 6 Meters
D. 10 Metres

B) What is the minimum distance a person can smoke, or have a thing that might spontaneously ignite or cause fire or explosion of a place where explosives are handled? (**1 mark)**

A. 3 Meters
B. 5 Metres
C. 6 Meters
D. 10 Metres

C) Who needs to be notified of the theft or loss of explosives from an underground Mine explosive magazine? **(1 mark)**

A. NSW Police
B. NSW Resources Regulator
C. Safework NSW
D. All of the above

D) The operator of a mine must implement and manage risks to health and safety associated with extremes of either or both the temperature and moisture content of air when the wet bulb temperature more than what level? **(1 mark)**

A. 20°C
B. 25°C
C. 27°C
D. 30°C

E) The mine operator of an underground mine must ensure the ventilation system for the mine provides air that is of sufficient volume, velocity and quality to ensure the general body of air in the areas in which persons work or travel has a concentration of oxygen that is at least what volume under normal atmospheric pressure? **(1 mark)**

A. 18.5 %
B. 19.0 %
C. 19.5 %
D. 20.0 %

F) The mine operator must ensure, at every point in areas of the mine where persons work or travel, the ventilation system for the mine provides at least what volume of air? **(1 mark)**

A. 1m3 of air per second
B. 5m3 of air per second
C. 10m3 of air per second
D. 15m3 of air per second

G) What must the mine operator of an underground mine ensure, before a significant change is made to the ventilation system for the mine? **(1 mark)**

A. Modelling of the change is carried out.
B. Consultation is conducted with the underground workers who will be effected by the change.
C. All primary fans are operational when the change is carried out.
D. Conduct a primary ventilation survey before and after the change.

H) When must the person conducting the business or undertaking who provides the personal protective equipment as a control measure provide audiometric testing for the worker - **(1 mark)**

A. within 6 months of the worker commencing the work, and in any event, at least every 3 years.
B. within 3 months of the worker commencing the work, and in any event, at least every 2 years.
C. within 3 months of the worker commencing the work, and in any event, at least every 3 years.
D. within 6 months of the worker commencing the work, and in any event, at least every 2 years.

I) How long does a health and safety representative for a work group holds a term of office? **(1 mark)**

A. 1 year
B. 2 Years
C. 3 years
D. 5 years

J) When must the person conducting a business or undertaking at a workplace establish a health and safety committee when requested to do so by a health and safety representative for a work group or 5 or more workers at that workplace? **(1 mark)**

A. 1 month
B. 2 months
C. 3 months
D. 6 months

Question 3

Total 10 marks

A) What are 5 matters listed in WHS (M&PS) R 2022 Schedule 1(3) (1) that must be considered in developing the control measures to manage the risks associated with mine shafts and winding systems? **(5 marks)**

B) As per WHS (M&PS) R 2022 Section 29 (1) when must the mine operator review and as necessary revise the PHMP - Mine shafts and winding systems? **(1 mark)**

C) As per WHS (M&PS) R 2022 Section 29 (2) What must the Mine operator do if the principal hazard management plan Mine shafts and winding systems is revised? **(1 mark)**

D) As per WHS (M&PS) R 2022 Section 27 (2) What must the operator conduct, in relation to each principal hazard identified, at the Mine? **(1 mark)**

E) As per WHS (M&PS) R 2022 section 28(2)(b) in what way must the PHMP - Mine shafts and winding systems be set out and expressed? **(1 mark)**

F) Name the four Principal Control plans listed in WHS (M&PS) R 2022 Schedule 2? **(1 mark)**

Question 4

Total 10 marks

A) As per WHS(M&PS) Act 2013 Section 14 what is a “notifiable incident”? **(1 mark)**

B) As per WHS (M&PS) Regulation 2022 Section 189 - What are six (6) serious injury or illness of a person. **(3 marks)**

C) As per WHS Regulation 2017 Section 55A - A psychosocial hazard is a hazard that arises from or relates to, what? Name three? **(3 marks)**

D) As per WHS Regulation 2017 - Section 55D - Control measures (psychosocial hazards).

What are six (6) matters that a person must have regard to when determining the control measures to implement for psychosocial hazards? **(3 marks)**

Question 5

Total 10 marks

A) You are the MEM at a large underground mine that uses the long hole open stopping method. The ore body is 15-20 metres wide and is dipping at 80 degrees and around 1200 metres long. Stopes are typically mined longitudinally 35 metres high x 15-20 metres wide (full ore body width) x 40 metres long around 90,000 to 100,000 tonnes. 10-metre-wide rock pillars are left between stopes due to the low grade of the ore. Stopes are filled with plain hydraulic sandfill from mine tailings. Stopes are mined bottom up and have a tramming drive in the footwall with 2 to 3 draw points. Hanging wall conditions range from very good and competent to poor and blocky with some jointing in some areas in the hanging wall.

Describe five (5) hazards associated with this backfill method? **(5 marks)**

B) Describe five (5) controls that you would ensure are in place to manage the five hazards identified above and how you would ensure they are effective? **(5 marks)**

Question 6

Total 10 marks

You are the MEM of a large deep underground Copper Mine. The Mine is currently 800 metres deep and open at depth below 1000 metres. The ore body is 10-15 metre wide x 400 metre long that is gently dipping at 80 degrees. Mining method used is small, long hole open stopes mining bottom up with cemented paste and no pillars. Production rate is 1.2 million tonnes/year. The level interval is 25 metres and stopes are mined longitudinally and around 30 long x 10-15 metres wide. The Mine is hot due to its depth and regularly records wet bulb temperatures over 27 C wet Bulb. Ground conditions are average to poor. Seismicity activity is increasing with depth of mining. The Mine trucks ore to the surface using 60 tonne dump trucks in a 6m x 6m x 1:7 decline, and access drives located in the foot wall. Escape rises are used as the 2nd means of egress. Large diameter raise bore holes are used for ventilation shafts and smaller diameter holes for 2nd means of egress, ore passes etc. Use standard twin boom jumbos and ancillary equipment for development, ground support, service work and charge up activities. Standard dump trucks, loaders & production drill rigs for production activities etc.

A) Describe what organisational structure you would implement to ensure the direct mining activities are conducted safely and efficiently. **(3 marks)**

B) On the next page draw an organisational chart showing the structure. **(3 marks)**

C) Describe how you would ensure the mining engineering standards at the Mine are effectively and safely implemented and meet the NSW legislative requirements. **(4 marks)**

Question 7

Total 10 marks

Work Health & Safety Regulation
2017

Part 3.1 Managing risks to health and safety

A) With reference to WHS Regulation Clause 35 - Managing risks to health and safety

A duty holder, in managing risks to health and safety, must do what two (2) things? **(2 marks)**

B) With reference to WHS Regulation Clause 36 - Hierarchy of control measures, if it is not reasonably practicable for a duty holder to eliminate risks to health and safety how must they must implement risk control measures to minimise those risks? **(5 marks)**

C) With reference to WHS Regulation 37 - Maintenance of control measures

What are two things that a duty holder who implements a control measure to eliminate or minimise risks to health and safety do to ensure that the control measure remains effective? **(1 mark)**

D) With reference to WHS Regulation 38 - Review of control measures.

What are four (4) circumstances when the duty holder must review and revise a control measure? **(2 marks)**

Question 8

Part B - Legislation knowledge and application

Total 15 marks

You are the MEM of large panel block caving mine that is in the process of developing a new panel cave that is located near one of two existing fully operational panel caves. The new cave development area is located 1200 meters below the surface. The Mine has two declines entries into the Mine - one main access decline and the other a conveyor decline. Both declines down case air to the bottom areas of the Mine. There are six large diameter ventilation shafts into the mine - four exhaust shafts and two intake shafts. The Mine uses ten x 60 tonne dump trucks to haul development ore & waste to the surface via the main access decline.
You are the MEM of the Mine, it is 9:00am and you are in your office on the surface of the Mine. You receive a call from the Mine control room that a fully loaded 60-tonne dump truck travelling up the main decline has caught fire. The truck is about halfway up the main decline. The truck operator has not been able to extinguish the truck fire, and the truck operator is safe above the fire location. The fire is now uncontrolled. There are 150 people located on the mines electronic tag board as being in the underground workings of the Mine.

A) As the MEM, what immediate actions would you take to ensure the incident is being managed appropriately and meets site and legislative requirements? **(4 marks)**

B) Is this a notifiable incident? Explain why, who to, when and how you would provide notification of this this incident if it is notifiable. **(2 marks)**

C) Provide a timeline over the next 24 hours of how you would manage this incident. List and discuss what safety systems / procedures that you would reference and implement to ensure that this incident is safely managed? (record any assumptions you use to support your responses) **(9 marks)**

Question 9

Total 15 marks

You are the MEM of a large UG Mine that regularly undertakes raisebore drilling of large diameter >4 metres and >400 m long holes from the surface to underground level for ventilation and other purposes.

A) Raise boring is a high-risk activity if the raisebore hole is over what two dimensions? **(1 mark)**

B) What information and documents must be provided to the NSW Resources Regulator in relation to a high-risk raisebore activity? **(2 marks)**

C) 1. What are six hazards associated with working around the bottom of a 5m diameter x 700-metre-long vertical raisebore hole from the surface to an underground level during the reaming process? The geotechnical report for the hole identified the following - hole may become wet between 50 to 100 metres below the surface due to a potential aquifer and two areas where poor ground may be encountered around the 340 to 360 metre and 120 to 125 metre areas below the surface. **(6 marks)**

2. What six controls would you implement to manage the six hazards you mentioned above. **(6 marks)**

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