(MB1)

Coal Competence Board

EXAMINATION FOR CERTIFICATE OF COMPETENCE AS

MANAGER OF A MINE

(Coal Mine Health and Safety Act 2002)

KURRI KURRI

Wednesday 24 July 2013

12pm to 1pm

MINING LEGISLATION

All five (5) questions are to be attempted.

All questions are of equal value - **20 marks each.**

(MB2)

Coal Competence Board

EXAMINATION FOR CERTIFICATE OF COMPETENCE AS

MANAGER OF A MINE

(Coal Mine Health & Safety Act 2002)

KURRI KURRI TAFE

Wednesday 24 July 2013 2.00 pm to 5.00 pm

Part B – MINE VENTILATION

BOTH questions are to be attempted.

QUESTION 1 – 100 MARKS

QUESTION 2 – 100 MARKS

Answers are to be written in this booklet only.

You have ten (10) minutes reading time prior to commencing the examination

No Hope N0#2

No Hope N0#2 is a modern Longwall mine that produces 5 million tonnes R.O.M of hard coking coal per annum in normal operation.

Normal production consists of
1 x LW
2 x Gateroad Development units and
1 x Mains Development unit.

The mine extracts the full seam section of the 2.9m - **No Joy seam.**

The **No Joy seam** has moderate in-situ methane (CH4) content of 6m³/tonne with medium propensity to spontaneous combustion.

Due to the unforseen geological structures encountered in MG 105 and the East Mains panel (greater than 6m major fault) the mine has had to access coal in the north of the lease.

This coal is currently being extracted via 1 x pillar extraction unit (PP2) and 1 x place change unit (2 North) in an attempt to offset future financial sort falls due to LW discontinuity.

LW 104 and a contract Roadheader unit (East Mains fault driveage) are still in operation, Maingate 105 has been aborted.

Exploratory drilling and core samples have indicated in-situ methane (CH4) content of up to 14m³/tonne on the lower (inbye) side of mains fault.

Ref attached: **A1 Colour Ventilation Plan “No Hope No2” Scale 1:10000**

Question 1 (Worth a total of 100 Marks)

From the data supplied and a critical viewing of the plan:

a) Identify and list all relevant issues and factors that you believe must be incorporated in, or be addressed by, the ventilation network you will adopt in the current workings as well as the future working inbye the East Mains fault. (50 marks)

b) Explain how each of the issues you have identified will be managed in your ventilation network. (50 marks)

Question 2 (Worth a total of 100 Marks)

On the accompanying plan:

a) Show the location of all production faces, together with their daily production levels. (20 Marks)

b) Ventilate the plan using the code of signs specified by the regulations and standards or survey drafting instructions, addressing the issues identified in question 1. (20 Marks)

c) Show the air quantities entering each production panel measured 100 metres outbye the last completed line of cut-throughs. Calculate the general body methane concentration in each panel return. (20 Marks)

d) Show the air quantities entering each surface intake entry into the underground workings and each surface return entry from the underground workings. (20 Marks)

e) Show locations and type of required atmospheric monitoring. (20 Marks)

END OF QUESTIONS

END OF PAPER

Question 1

(Worth a total of 20 marks)

In the *Work Health and Safety Act 2011*, Division 4 Duty of officers, workers and other persons, **Section 27 Duty of officers, Subsection (5)**, there is reference to **"*due diligence* includes taking reasonable steps:"**.

Outline the matters included in this particular subsection.

Question 2

(Worth a total of 20 marks)

As a Manager of Mining Engineering you may have emplacement areas located within your respective Colliery Holding/Mining Lease.
Outline the matters included under the *Coal Mine Health and Safety Act 2002*, Part 6, Division 3 **Control of emplacement areas** with respect to:

a) **Section 98 Definitions**
b) **Section 100 Establishment of emplacement areas**

Question 3

(Worth a total of 20 marks)

In the *Work Health and Safety Act 2011*, Part 2 Health and Safety, Subdivision 2 What is reasonably practicable, refers to **Section 18 What is "reasonably practicable" in ensuring health and safety.**

Please detail the matters that are included in this section.

Question 4

(Worth a total of 20 marks)

The *Coal Mine Health and Safety Regulation 2006*, Part 4 Safety at coal operations, Division 1 Controlled materials, plant and practices, Subdivision 1 Controlled materials, plant and practices refers to **Clause 67 Flammable materials.**

Please detail your understanding of this clause.

Question 5

(Worth a total of 20 marks)

Part 5, Division 6, Section 76 of the *Coal Mine Health and Safety Act 2002* refers to **"Contractors duties regarding subcontractors".**

Outline the duties that are required under this section.

END OF QUESTIONS

END OF EXAM

(MB3)

Coal Competence Board

EXAMINATION FOR CERTIFICATE OF COMPETENCE AS

MINE MANAGER

(Coal Mine Health and Safety Act 2002)

KURRI KURRI

Thursday 25 July 2013

9am to 12pm

COAL MINING PRACTICE

Five (5) questions ONLY are to be attempted for this paper

This paper is in TWO sections - A and B

Four (4) questions must be attempted from section A (questions 1 - 6)

One (1) question only is to be attempted from section B (questions 7 - 8)

ALL questions are of equal value – **20 marks each**

MB3 Section A - Underground

Question 1 (Worth a total of 20 marks)

You are the Manager of Mining Engineering at an underground longwall mine. This operation works 24/7 and produces in the order of 5 mtpa of ROM coal. On the surface the coal handling facilities include several stockpiles and reclaim areas/tunnels. As such the Operator should develop and implement a hazard management plan(s) to provide for the safe operation and maintenance of the systems in relation to the management of stockpiles and reclaim areas/tunnels.

In reference to the above information, please answer/address the following:

a) Which Australian Standard should these hazard management plan(s) be consistent with?

b) What would you ensure was provided in the development and implementation of the hazard management plan?

c) In relation to coal stockpiles, list the potential hazards that may be identified.

d) What would be your recommended minimum controls when assessing the potential risks for a dozer to be engulfed in a draw down point on the coal stockpile?

Question 2 (Worth a total of 20 marks)

You are the Manager of Mining Engineering of an underground longwall mine that works 7 days per week producing an average of 120,000 tonnes per week of ROM coal product.

The current longwall block has experienced igneous intrusions in the form of dykes. These dykes vary in width, consistency and hardness. Parts of the dykes in certain places are over 300 MPa and generally range from 100 – 250 MPa. They are typically 1 to 2 metres in width, consistency and hardness but can vary from less than 1m to over 4m. Usually the thicker the dyke the harder it is. Associated with the dyke is a band of heat treated coal (cinder). The thicker the dyke the wider and harder the band of cindered coal gets. The heat treatment of the coal produces an amorphous (shapeless) band of cinder which is up to 100MPa in hardness and the lack of cleat or structure renders it difficult to extract or cut.

It has been decided to shotfire the dyke and also employ the use of a coal cutter to form the initial vertical free face. A Longwall Dyke Extraction Management Plan has been generated.

In reference to the above information, please answer/address the following:

a) What would be the main components of the Longwall Dyke Extraction Management Plan?

b) Draw a diagram showing the dyke extraction cycle.

c) What should be considered in the design for a round of shots to excavate the dyke?

d) What are the hazards associated with not drilling to plan?

Question 3 (Worth a total of 20 marks)

An Underground Mine needs to drive their 5 headings Mains through a 25m clay dyke to access future reserves.

The dyke is at 90 degrees to the direction of the Mains, there is no displacement of the seam and roof conditions on both sides of the dyke are competent. However, the clay forming the dyke is dry initially but quickly deteriorates when exposed to air and moisture.

Explain, with the aid of diagrams how you would drive these headings through this dyke, include strata support, machinery to be used and how you would dispose of the material mined.

Question 4 (Worth a total of 20 marks)

You are about to start a pillar extraction panel, and you are required to put together an emergency repowering/recovery plan for instances when power has been lost to the Continuous Miner whilst out in a lift.

Explain how you would put this plan together and list what you would include in this plan.

Question 5 (Worth a total of 20 marks)

You are required to commission a new upcast ventilation shaft, which has 2 centrifugal fans fitted to it.

Because of the positioning of the new shaft, it is expected that the Ventilation quantity will double previous available quantities however, pressure will only double previous pressures.

The old fan is to be turned off, and removed, and the portal will become a segregated intake

Explain how you would undertake this exercise and list the steps you would take, include any preparatory work.

Question 6 (Worth a total of 20 marks)

You are the Manager of a pillar mine, and one of your working panels has shown increasing levels of Carbon Monoxide and higher Hydrocarbons, to the extent that you have made the decision to seal the panel.

The panel has 3 entry headings, from left to right, a return, a belt roadway, and a transport roadway.

There are minimal levels of Methane in the return air, and this is normal for this seam.

Explain, with the aid of drawings, the steps you would take in sequence to safely seal this panel and list the precautions you would put in place to ensure the safety of people and equipment at the mine.

MB3 Section B - Opencut

Question 7 (Worth a total of 20 marks)

a) In relation to excavators and material removal, how do you calculate:

i) Theoretical bucket size (TBS)?

ii) Practical bucket size (PBS)?

b) An open cut mine is located in close proximity to a small village and consequently has some operating constraints placed upon it.

The mine is only allowed to operate 12 hours per day, 5 days per week and 46 weeks per annum.

Currently the mine is removing 3 million m^3 overburden per annum by use of a large excavator and rear haul dump trucks.

The following additional information is also known:

Machine availability = 0.9
Dipper Fill Factor = 0.8
Swell Factor = 0.67
Utilisation = 0.9
Cycle time = 40 seconds

What would be the practical bucket size (PBS) of the excavator to remove this amount of overburden for the mine above over a year?

Question 8 (Worth a total of 20 marks)

a) What is the stripping ratio and how is it calculated?

b) Why would 'ripping with dozers' be used in preference to 'drill and blast'?

c) What are the physical characteristics of the rock formation that favours dozer ripping?

d) List the conditions that make dozer ripping of the rock formation more difficult.

e) When working steep slopes whilst pushing and/or ripping with dozers, consideration should be given to what?

f) Tip breakage on the dozer ripper shanks can be a major problem. What would be your recommendations for tip usage in different ripping conditions?

END OF QUESTIONS

END OF EXAM

No Hope No.2 Colliery

SCALE: 1:10000	DATE:
DRAWN:	DRG NO:
CHECKED: -	REV NO: 0
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