

(DEP)

## NSW Coal Competence Board

### EXAMINATION FOR CERTIFICATE OF COMPETENCE AS DEPUTY

*(Coal Mine Health & Safety Act 2002)*

NORTHERN REGION  
SOUTHERN REGION  
WESTERN REGION

**Tuesday 25 February 2014**

10am to 12.30pm

**Coal Mining Practice and Legislation**

#### **INSTRUCTION TO CANDIDATES**

All five (5) questions are to be attempted.

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

10 minutes reading time is allowed prior to the start of the examination.

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**Question 1 (total 20 marks)**

- a) Clause 45 of the Coal Mine Health and Safety Regulation 2006 (Contents of emergency management system) lists certain elements that must be adequately addressed in an emergency management system for a coal operation. Clause 45 (b) specifies the minimum fire and emergency provisions for the underground parts of a coal operation. List five of these elements in your own words.

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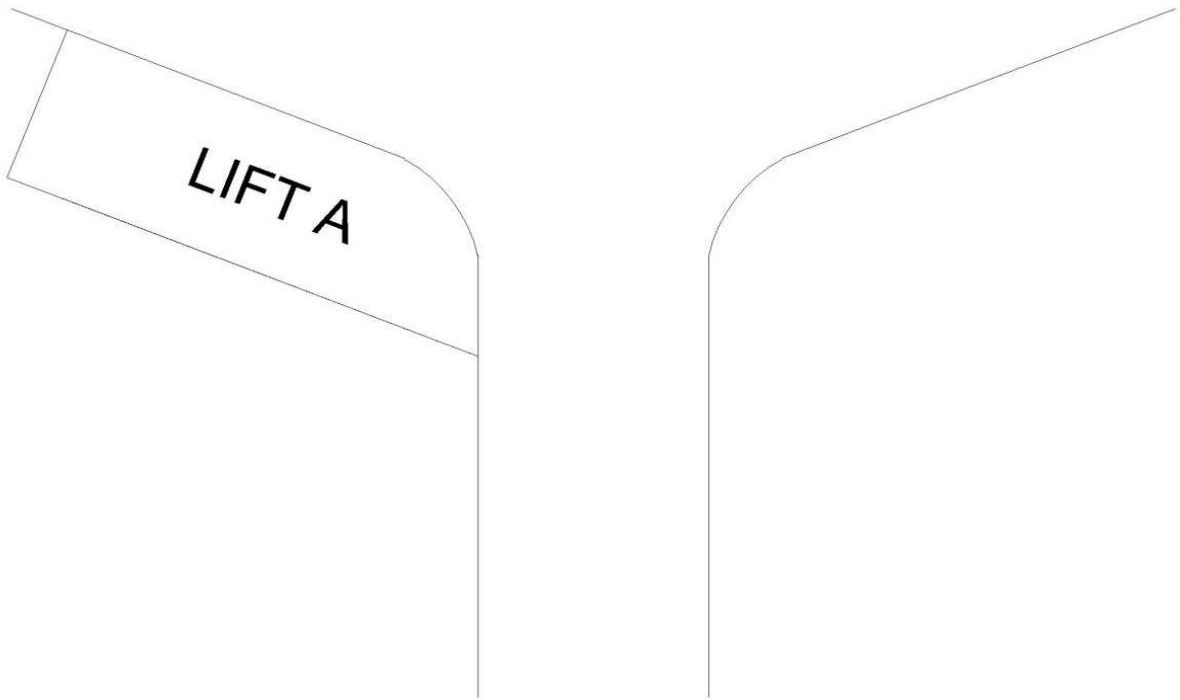


FIGURE 1

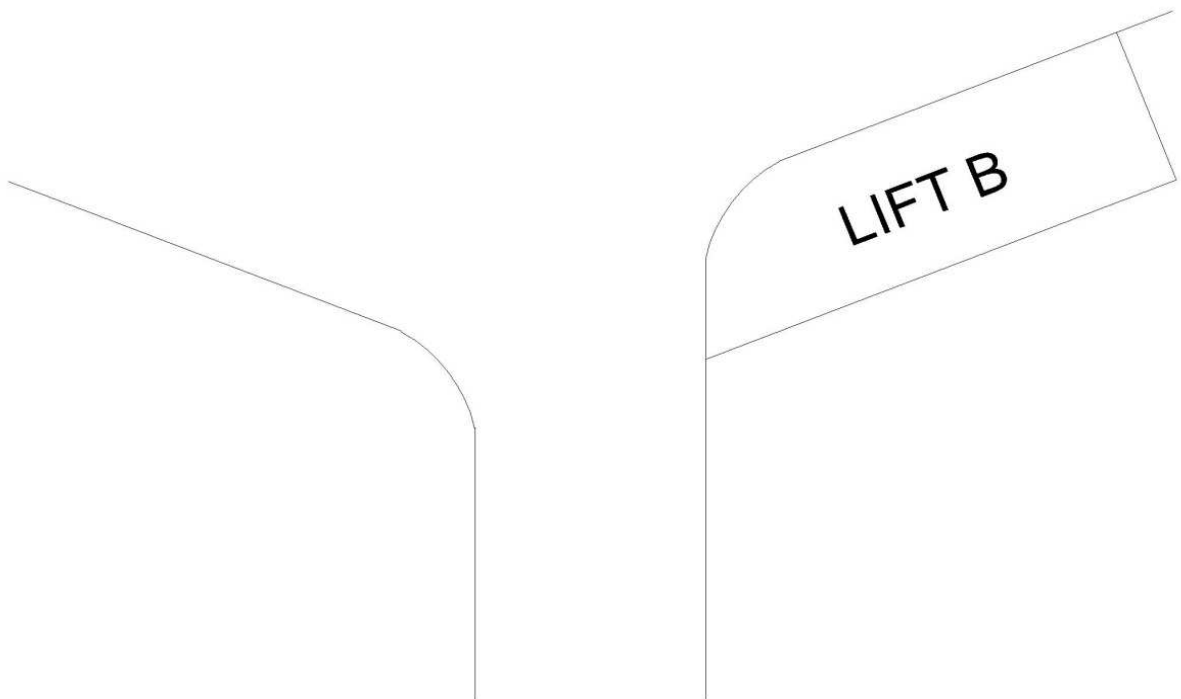


FIGURE 2

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Question 2 (total 20 marks)

- a) The previous diagram shows a pillar extraction area. The panel is extracting left and right using three breaker line supports. On the diagram show the position of the breaker line supports for Lift A on figure 1 and their position for Lift B on figure 2. Include any relevant dimensions that affect their positions.

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- b) The extraction sequence for pillar extraction is laid out in the Manner and Sequence of Extraction. Who, and under what conditions, can make changes to the sequence of extraction?

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**Question 3 (total 20 marks)**

You are a deputy in a longwall panel. The panel is on maintenance with production expected to commence towards the end of the shift. You have 11 men in the panel. You meet the off going deputy in the crib room at the start of shift and the routine of inspections has not been interrupted.

Two miners are building link-n-locks in the tailgate 50 metres outbye the face. These men are both experienced at the mine and in the task. They are regular members of your crew.

Two electricians are doing routine preventative maintenance on the shearer. They do not have to access the face. One electrician is the normal panel electrician and the other is a third year apprentice.

Two fitters are carrying out hydraulic maintenance on the supports. One fitter is on overtime – you have not worked with him before, but he is experienced at the mine and in the task. The other fitter is a contractor on his second shift on the wall.

Two miners are in the maingate, inbye the face building a goaf seal. They are contractors. One man has 13 months experience on this work at the mine and the other has one month's experience. You have not worked with them before.

Three miners are installing bolts for additional support in the maingate belt road 100 metres outbye the face. Two of these men are regular members of the crew, experienced in the task and at the mine. The third man is a recent mining engineering university graduate who has just been assigned to your crew to get face experience.

List your inspection regime for each task, giving reasons for the frequency and timing of that inspection. Include any instructions, specific to those tasks that you would give the workmen.

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**Question 4 (total 20 marks)**

- (a) What are the physiological effects of breathing in an atmosphere that contains 3% carbon dioxide?

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- (b) What are the physiological effects of breathing in an atmosphere containing greater than 5% carbon dioxide?

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- (c) Coal seams may liberate a mixture of carbon dioxide and methane (commonly called Illawarra Bottom Gas). At what percentage of carbon dioxide to methane in the gas mixture liberated from the seam will the gas migrate to the roof and to the floor?

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- (d) Describe the effects of barometric change on a sealed area? How will this affect how a deputy inspects the seals of such an area?

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- (e) What are the legal limits in a coal mine for carbon dioxide, carbon monoxide, and methane?

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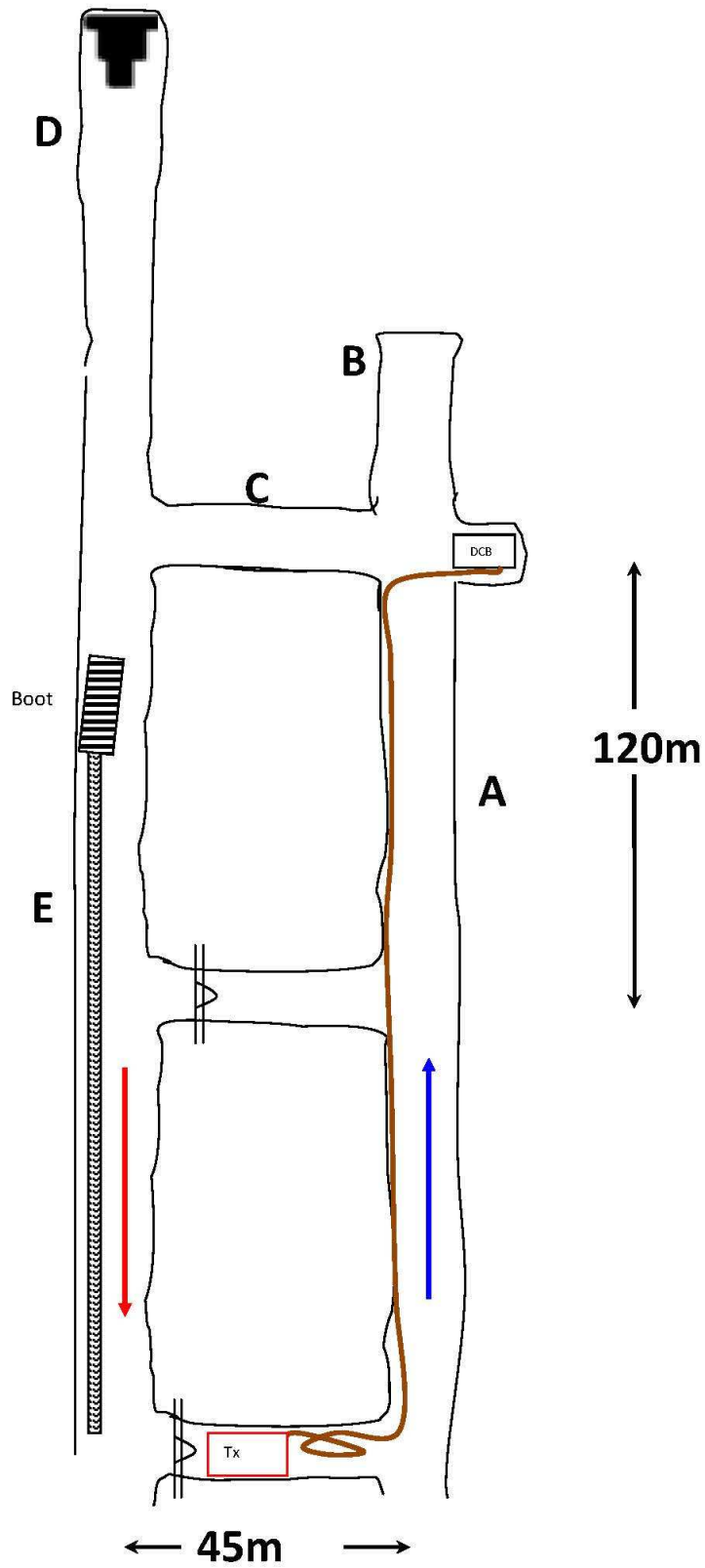
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Plan 1



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**Question 5 (total 20 marks)**

- a) Shown in the previous plan (Plan 1) is a two heading maingate unit in a gassy underground coal mine. On the plan mark the following:
  - i. Location of auxiliary fan and ducting.
  - ii. Two shuttle cars and their cables and anchor points.
  - iii. Location of Deputies station
  - iv. Location of explosion barrier/s
  - v. Shade in or describe the location of the hazardous zone

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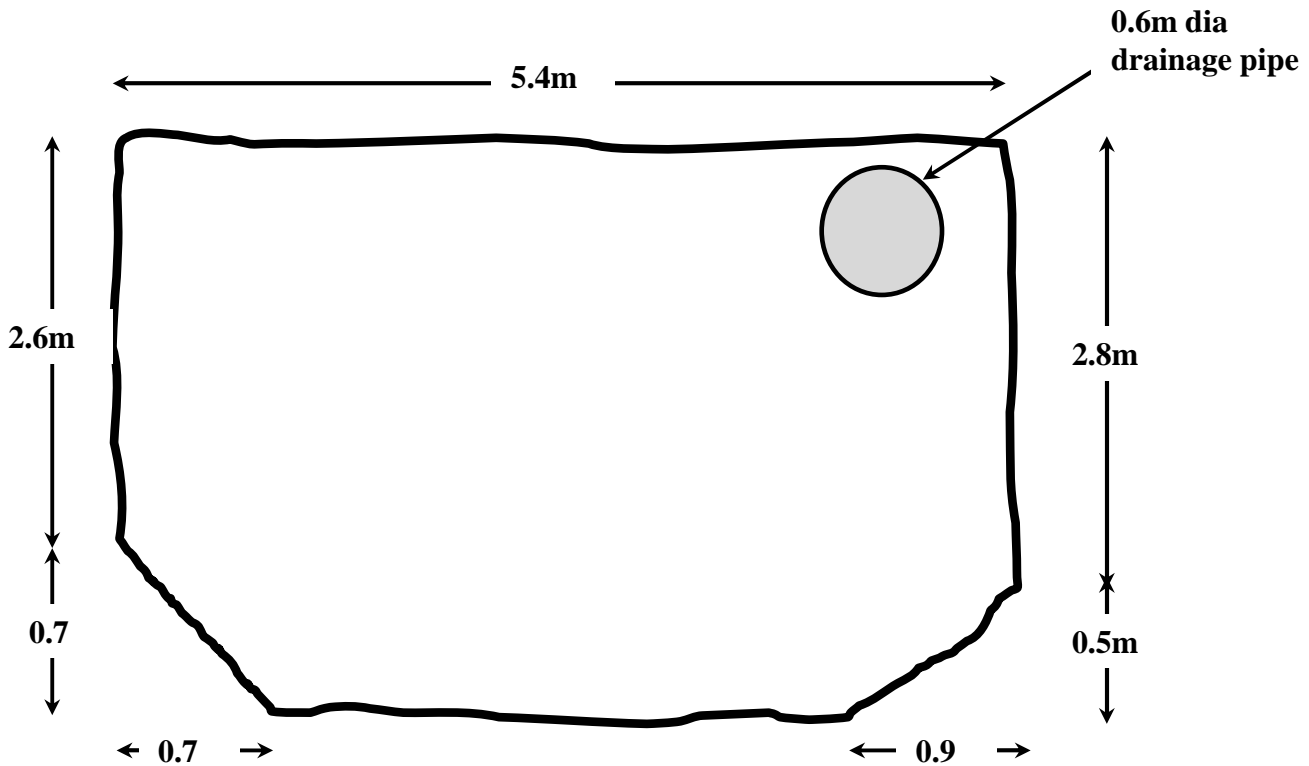
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- b) You are required to do a ventilation reading at Point A. You measure up the roadway and its dimensions are shown in Fig 1 below.



You take two velocity readings with the anemometer.

Velocity 1 = 1.35m/sec  
Velocity 2 = 1.30m/sec

Please refer to Plan 1 (page 13) and Fig 1 to answer the following questions.

- i. Calculate the quantity of air in the roadway

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- ii. You have an 18m<sup>3</sup>/sec auxiliary fan available and a 23m<sup>3</sup>/sec unit. Which one do you think you should use in this panel and why?

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iii. Approximately how much air would you have at the following points:

B

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C

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E

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iv. How many kW of diesel engine horsepower could you allow to operate in the main panel ventilation circuit according to current NSW regulations?

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v. Briefly describe two causes of recirculation associated with using an auxiliary fan

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vi. How would you as the Deputy continuously monitor for recirculation in a practical sense?

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vii. What could you do to maximise air to the face at all times?

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viii. Assuming the area of the heading at the miner is 16m<sup>2</sup> how much air would you need to deliver there to legally cut coal under the NSW regulations?

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**END OF QUESTIONS  
END OF PAPER**