

CANDIDATE EXAM PAPER

CANDIDATE NUMBER: _____

DEP – Coal mining practice and legislation

DEPUTY OF UNDERGROUND COAL MINES

EXAMINATION FOR CERTIFICATE OF COMPETENCE

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

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 2014

Explosives Act 2003

Explosives Regulation 2013

This Examination is held in the following location:

Region: New South Wales

Venue: Tocal College

Room: The Hall

Start date/time: 18 May 2022 09:50:00

DEP – Coal mining practice and legislation

INSTRUCTIONS TO CANDIDATES

DEP – Coal mining practice and legislation | May-2022

| Q # | Marks | Available Marks | Marked by <i>Initials</i> | Summary comments to justify |
|--------------------|-------|-----------------|------------------------------|-----------------------------|
| 1 | | 10 | | |
| 2 | | 10 | | |
| 3 | | 10 | | |
| 4 | | 10 | | |
| 5 | | 10 | | |
| 6 | | 10 | | |
| 7 | | 10 | | |
| 8 | | 10 | | |
| 9 | | 10 | | |
| 10 | | 10 | | |
| Paper Total | | 100 | | <i>Marks checked by:</i> |

EXAM BOOKLET

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.

Question 1

a) Briefly explain how a ventilation survey should be completed during development mining to ensure legislative compliance. **(3 marks)**

b) Complete the following ventilation calculation **(2 marks)**

i) Roadway width = 5.5m

ii) Roadway height = 3.2m

iii) Velocity = 2.5m/s

c) Underground mines can be prone to layering of certain gases.

i) What is the relative density for carbon dioxide? **(1 mark)**

ii) What is the relative density of hydrogen sulphide? **(1 mark)**

iii) What is the relative density of Methane **(1 mark)**

d) Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 (NSW), Clause 71 refers to Ventilation.

What is the minimum quantity required to operate a diesel engine with a maximum output capacity of 80kW. Show calculations as necessary. **(2 mark)**

Question 2

Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 (NSW), Clause 3 refers to Definitions.

a) What is the definition of a hazardous zone **(4 marks)**

b) During maintenance activities in a development production panel, the panel LHD has contacted the shuttle car cable during roadworks. Upon inspection by the electrician there is evidence of arcing. Briefly describe what actions the deputy should take? **(6 marks)**

Question 3

You are a deputy in a 2-heading gate road production panel and are in the process of conducting inspections in the production area.

a) List and briefly describe five (5) things a deputy should be inspecting for at the auxiliary fan? **(5 marks)**

b) List and briefly describe five (5) compliance related inspections a deputy should be inspecting for at the cutting face. **(5 marks)**

Question 6

During your first inspection of the production face you notice that the roof support installed on the previous shift for a distance of approximately 15m back from the face does not comply with the Manager Support Rules. The outside bolts of the 4 bolt pattern have been installed too close to the rib line and a distance exceeding the tolerance on the support plan.

a) What action would you take relative to this finding? (5 marks)

b) What information needs to be communicated relative to this event and to who? (5 marks)

Question 7

Gas Chart

Complete the entries in the gas chart below (10 marks)

| Gas | Chemical Symbol | Relative Density | Explosive Limits | Effects / Properties | Legal Limits |
|----------------------|--------------------|---------------------|---------------------|-------------------------|-----------------|
| Oxygen | | | | | |
| Nitrogen | | | | | |
| Carbon Dioxide | | | | | |
| Carbon Monoxide | | | | | |
| Methane | | | | | |
| Hydrogen | | | | | |
| Hydrogen Sulphide | | | | | |
| Sulphur Dioxide | | | | | |

Question 8

WHS(M&PS) Regulations 2014 – Clause 179 lists the “Dangerous Incidents”.

a) From the following list select only the 10 incidents that are in this “clause” (10 marks)

- an electric arc occurring in the hazardous zone in an underground coal mine that is directly observed or that leaves visible evidence on an electric cable,
- a collision involving a vehicle or mobile plant,
- a vehicle or plant making contact with an energised source having a voltage greater than 1,200 volts (other than testing equipment applied to energised equipment in accordance with the WHS Regulations),
- an unplanned fall of ground, roof or sides that impedes passage, extends beyond the bolted zone or disrupts production or ventilation,
- the unintended interruption of the main system of ventilation in an underground excavation or tunnel,
- damage to, or failure of, any part of a powered winding system or a shaft or shaft equipment,
- a fire in the underground parts of a mine, including where the fire is in the form of an oxidation that releases heat and light,
- the inrush of water, mud or gas in workings in an underground excavation or tunnel,
- ejection of rock from blasting that falls outside the blast exclusion zone (being the area from which persons are excluded during the blasting)
- a misfire or unplanned explosion of an explosive or explosive precursor (but not in the case of a misfire at a mine other than a coal mine if the misfired explosive can be fired without any significant risk to a person),
- an unplanned event that causes less than 2 exits from an underground mine to be available for use,
- an uncontrolled escape of a pressurised substance,
- a coal burst or rock burst at an underground mine,
- the detection of a concentration of methane in the general body of the air in an underground coal mine (other than in a sealed area or goaf) that is 2.5% by volume or greater,
- the unintended activation, movement, or failure to stop of vehicles or machinery

Question 9

You are the Deputy in a 3 x heading development panel that has to do an extended driveage of 240m (3 rows x 80m pillars) from the section bootend using a continuous miner and 2 x shuttle cars.

You have been given the task of developing a procedure to achieve this.

With the aid of sketches explain the hazards and how you would set up the panel for the last driveage in the 3rd row of pillars. 10 marks

Question 10

You are the Deputy in a Longwall Production district. You have 3 contractors who are tasked with constructing a monolithic goaf seal using a placer pump in the first open cutthrough inbye the LW face. You are **not** familiar with the contract workers.

- a. Describe what discussions and checks you would undertake with the contract crew prior to them commencing work. (5 Marks)

- b. During the shift you notice during your inspections that there is excessive dust being generated during the loading of product into the placer pump. What actions would you take relative to managing the exposure of personnel to dust. (3 Marks)

- c. What are the legal limits for dust exposure? (2 Marks)

i) Respirable Coal Dust

ii) Crystalline Silica Dust

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