

WESTERN AUSTRALIA

RESTRICTED QUARRY MANAGER'S CERTIFICATE OF COMPETENCY

QUARRYING EXAMINATION

2 October 2013

Time allowed: **Three (3) hours**
Reading Time: **15 minutes**

ADVICE TO CANDIDATES

- **Answers must be written in ink or ball point pen.**
- **Use sketches to describe your answers where appropriate.**
- **Sketches may be done in pencil.**
- **Check that you have the correct examination paper.**

A Total of 60 per cent is required for a pass.

Read all questions carefully and make sure that you understand what you are being asked to do.

**THERE ARE SEVEN (7) QUESTIONS IN THE PAPER.
YOU SHOULD ATTEMPT QUESTION 1 WHICH IS COMPULSORY,
AND FIVE OTHER QUESTIONS.**

QUESTION 1

Regulations now require the preparation of an Emergency Plan for all mine sites.

This involves, among other things, the identification of hazards that might cause an emergency at the mine, and the development of procedures to deal with emergencies.

Assuming you are the quarry manager of a 20 metre deep clay pit which mines from 4 x 5 metre high benches using backhoes for digging and loading:

- (a) **List five (5) hazards, other than fire, which you believe might lead to an emergency arising in such an operation, and give your reasons.** **10 marks**
- (b) **What procedures would you establish for a haul truck driver to follow in the event of an outbreak of fire in the engine compartment while:**
- (i) **travelling on the flat?** **5 marks**
 - (ii) **travelling on the ramp?** **5 marks**

Total 20 marks

QUESTION 2

Before driving a light vehicle, what safety checks (pre-start and after start) must be made?

What other precautions must be taken whilst driving a light vehicle and when leaving it parked in order to inspect the workplace?

Total 16 marks

QUESTION 3

You are the newly appointed manager of a local open pit operation. The General Manager has dismissed your predecessor for comments to the effect that "if the town's residents can't stand the noise living next to a pit they should move out of town or wear earplugs. This pit supports the town and the locals shouldn't forget it."

You have just received three long term compensation claims for hearing loss from ex-employees. Many genuine complaints are received daily from neighbours about the noise generated from the pit. The General Manager asks for a report on these claims and complaints.

Write a letter to the General Manager explaining the reasons for the problems and the steps you would take to rectify them. Clearly identify the likely sources of noise in the plant and the pit.

Total 16 marks

QUESTION 4

- (a) List four (4) methods which may be used to free large rocks when they become jammed in a jaw crusher. 4 marks
- (b) Give the advantages and disadvantages of each method. 8 marks
- (b) What safety precautions are necessary with respect to each method?. 4 marks

Total 16 marks

QUESTION 5

- (a) What are the advantages and disadvantages of breaking rock by ripping as against blasting? 12 marks
- (b) Under what circumstances would you use ripping? 4 marks

Total 16 marks

QUESTION 6

As the Quarry Manager of a two bench open pit, working two shifts and utilising backhoes, front end loaders, dozers and haul trucks, you have decided, as part of your duty of care obligations, to conduct a thorough assessment of the workplaces after dark.

Describe the extra hazards that may arise due to night-time Operations and the precautions you would take to minimise them.

Total 16 marks

QUESTION 7

You are the quarry manager of a medium sized granite quarry using conventional drill and blast techniques.
A number of misfires have occurred in the latest blast.

- (a) List five (5) possible causes for the misfires.**
- (b) Describe three (3) methods of safely disposing of the misfired charges in the blast holes.**

10 marks

6 marks

Total 16 marks

END OF PAPER

WESTERN AUSTRALIA

RESTRICTED QUARRY MANAGER'S CERTIFICATE OF COMPETENCY
(EXPLOSIVES)

QUARRYING EXAMINATION

April 2013

Time allowed: **Three (3) hours**

Reading Time: **15 minutes**

ADVICE TO CANDIDATES:

- **Answers must be written in ink or ball point pen.**
- **Use sketches to describe your answers where appropriate.**
- **Sketches may be done in pencil.**
- **Check that you have the correct examination paper.**

A Total of 60 per cent is required for a pass.

Read all questions carefully and make sure that you understand what you are being asked to do.

**THERE ARE SEVEN (7) QUESTIONS IN THE PAPER.
YOU SHOULD ATTEMPT QUESTION 1 WHICH IS COMPULSORY,
AND FIVE (5) OTHER QUESTIONS.**

QUESTION 1 – COMPULSORY

Two blast patterns are illustrated below, and on the attached sheet. In each case, all holes contain the same number in-hole delay detonator, and are initiated via detonating cord trunk line and trunk line delays.

Do Not Draw the Answer to this Question in your Examination Booklet

Use the tear-off copy at the end of the paper

On Figure 1 draw a trunk line and trunk line delay layout that you could use to initiate the blast in a “V” shaped pattern Show the position and number of the trunk line delays using delays of 17 and 25ms.

10 marks

On Figure 2 draw a trunk line and trunk line delay layout that you could use to provide sequential initiation on a hole by hole basis. Show the position and number of the trunk line delays using delays of 17 and 42ms.

10 marks

Total 20 marks

Hand in the marked up copy with your examination book

FIGURE 1

FREE FACE

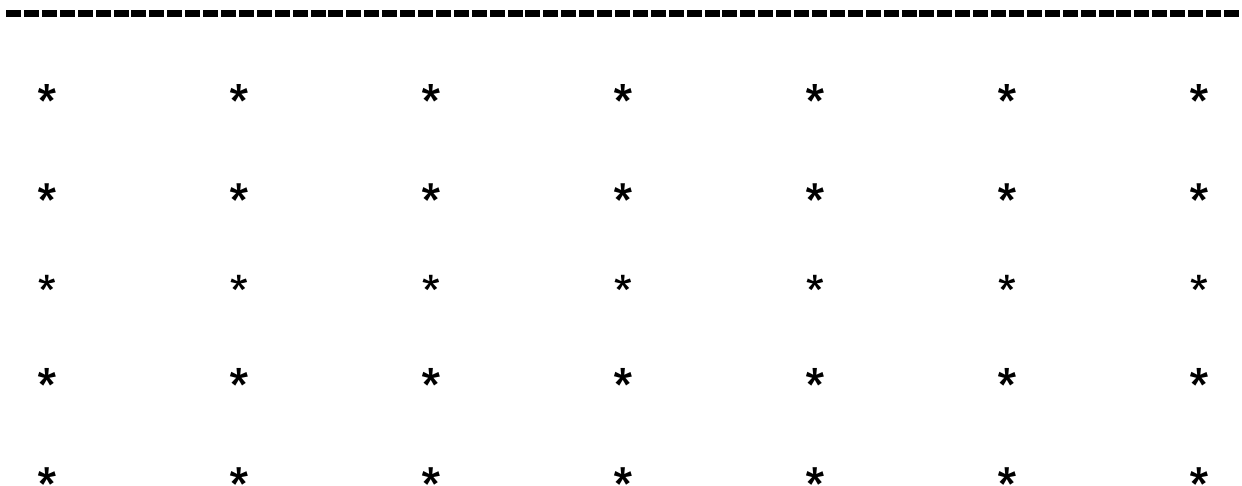
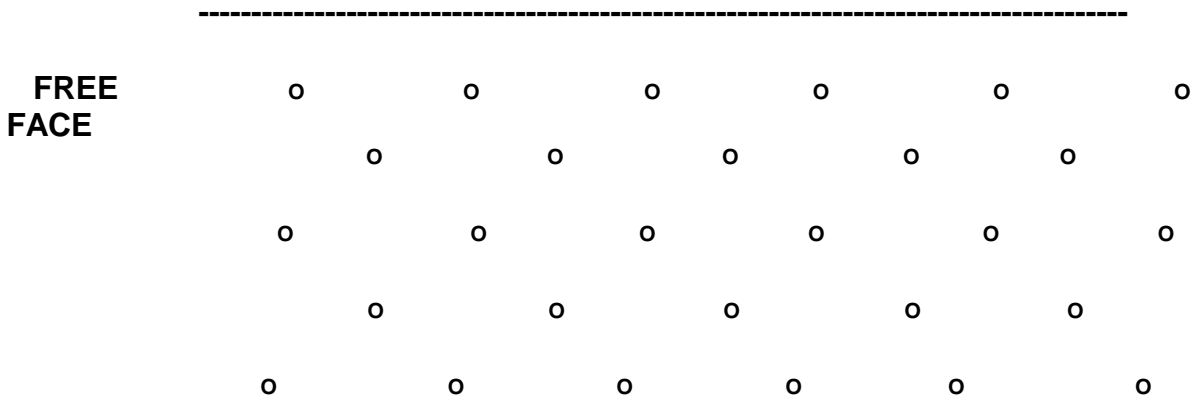


FIGURE 2

FREE FACE



QUESTION 2

You are the manager of a small 30m deep open pit that is nearing the end of its life. The top 10m is in oxidised material and the remaining 20m is in unweathered material. A bund wall is to be constructed prior to abandonment of the pit.

- (a) What is the purpose of the bund wall(s)?
- (b) What material would you use to build the bund walls? (Give reasons)
- (c) Where would you locate the bund wall? (Show on sketch in cross section)
- (d) How high would you aim to make the bund wall?
- (e) What other action are you required to take before abandoning the pit?

Total 16 marks

QUESTION 3

Injuries and a fatality have recently occurred on minesites due to lightning strikes.

As the Quarry Manager, describe the precautions you would include in your induction training for the following:

- (a) Exposed outdoor areas (8 marks)
- (b) Inside a building (6 marks)
- (c) On a partially charged bench (2 marks)

Total 16 marks

QUESTION 4

A severe tropical cyclone is expected to pass over your quarry in approximately 30 hours.

As Quarry Manager, explain the precautions you would take to safeguard personnel, equipment and the following areas:

- (a) Personnel (6 marks)
- (b) Equipment (4 marks)
- (c) Wall stability (2 marks)
- (d) Quarry drainage (2 marks)
- (e) Workshop (2 marks)

Total 16 marks

QUESTION 5

You have recently been appointed Manager of a granite quarry, complete with a crushing and screening plant. The quarry is located in a remote area, and water has to be carted. In the past the operations have been stopped by the inspector on a number of occasions due to excessive dust being released to the working environment. Personal dust sampling has confirmed excessive exposure. Sufficient funds have been allocated for rectifying the problem.

Describe what action you would take to rectify the situation, and your reasons for your choices.

Total 16 marks

QUESTION 6

An underground water main in the treatment plant is found to be leaking. An excavation is required to repair the leak.

Describe the procedures you would follow to ensure the task is done safely.

Total 16 marks

QUESTION 7

List eight (8) factors which should be considered in the design of safe pit ramps.

Total 16 marks

END OF PAPER

FIGURE 1

FREE FACE



*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*

FIGURE 2

FREE FACE



FREE	o	o	o	o	o	o
FACE						
	o	o	o	o	o	o
	o	o	o	o	o	o
	o	o	o	o	o	o

NAME OF CANDIDATE

<p>TEAR OFF THIS PAGE AND INCLUDE WITH YOUR EXAMINATION BOOKLET</p>
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WESTERN AUSTRALIA

RESTRICTED QUARRY MANAGER'S CERTIFICATE OF COMPETENCY

QUARRYING EXAMINATION

3 October 2012

Time Allowed: **Three (3) hours**
Reading Time: **15 minutes**

ADVICE TO CANDIDATES:

- **Answers must be written legibly in ink or ball point pen.**
- **Sketches may be done in pencil.**
- **Check that you have the correct paper.**

Note: An aggregate of 60 percent is required for a pass.

Read the questions carefully before answering them in your own words. Use sketches to illustrate your answers where appropriate. Keep answers short and use point form where appropriate.

- **THERE ARE EIGHT (8) QUESTIONS IN THE PAPER.**
 - **QUESTIONS 1 AND 2 ARE COMPULSORY.**
 - **ANSWER FIVE OTHER QUESTIONS OF YOUR CHOICE.**
-

QUESTION 1 (Compulsory question)

Briefly describe three ways to dispose of a misfired charge of blasting agent in a pit blasthole.

TOTAL: 20 Marks

QUESTION 2 (Compulsory question)

You are the Quarry Manager in charge of an open pit mine operating in a district containing old, underground mine workings. You have the old plans from the company which operated in the area showing underground levels, stopes and other accesses of the old mine.

What are the procedures and safety measures you would adopt to delineate the position of the voids beneath the pit floor and to determine the thickness and strength of the pit floor.

TOTAL: 20 Marks

Answer any five (5) of the following questions:

QUESTION 3

Give details on safety points with respect to waste dump areas, which you would give to:

- (a) truck drivers **(4 Marks)**
- (b) dozer operators **(5 Marks)**

In addition:

- (c) list three reasons you would dump slightly uphill in establishing your waste dumps **(3 Marks)**

TOTAL: 12 Marks

QUESTION 4

With respect to a quarry explain the meaning of any six of the following terms using sketches where appropriate:

- (a) bench height (2 Marks)
- (b) bench (2 Marks)
- (c) berm (2 Marks)
- (d) Toe (2 Marks)
- (e) face angle (2 Marks)
- (f) inter-ramp slope angle (2 Marks)
- (g) overall pit slope angle (2 Marks)

TOTAL: 12 Marks

QUESTION 5

- (a) Use a diagram to describe how you would build a bund wall for abandoning an open pit mine. Consider the pit to be 60 metres deep of which the top 20 metres is in weathered material.

Describe how you would calculate the correct position for the bund wall.

- (b) What material would you use to build the bund wall and why?
- (c) Moon-scaping is a technique used for waste dump rehabilitation. Prepare a brief sketch to describe the technique.

TOTAL: 12 Marks

QUESTION 6

- (a) Name four places where dust is generated in and around a mine. (2 Marks)
- (b) Explain what are the 5 principles that control of dust is based upon (10 Marks) and give one example how each might be used.

TOTAL: 20 Marks

QUESTION 7

You have been informed by the Quarry Supervisor that a dump truck and a light vehicle have collided on the pit haul ramp. The vehicle driver appears to be seriously injured and trapped. As Quarry Manager what course of action would you take?

(Note: Detailed description of the rescue is not required in the answer)

TOTAL: 12 Marks

QUESTION 8

The following terms are commonly used in relation to drilling and blasting. Describe what each term means. (Use sketches to assist with your answer if you wish).

Burden

Spacing

Powder factor

Velocity of detonation

Delay firing

Stemming

Detonating cord

TOTAL: 12 Marks

END OF PAPER

WESTERN AUSTRALIA
RESTRICTED QUARRY MANAGER'S CERTIFICATE OF
COMPETENCY
QUARRYING EXAMINATION

18 April 2012

Time allowed: **Three (3) hours**
Reading Time: **15 minutes**

ADVICE TO CANDIDATES

- **Answers must be written in ink or ball point pen.**
- **Use sketches to describe your answers where appropriate.**
- **Sketches may be done in pencil.**
- **Check that you have the correct examination paper.**

A Total of 60 per cent is required for a pass.

Read all questions carefully and make sure that you understand what you are being asked to do.

THERE ARE SEVEN (7) QUESTIONS IN THE PAPER.
YOU SHOULD ATTEMPT QUESTION 1 WHICH IS COMPULSORY,
AND FIVE OTHER QUESTIONS.

QUESTION 1

You are in charge of a quarry and crushing and screening plant located about 15km from a medium sized country town.

An operator has had his right arm caught between a loaded conveyor belt and an idler roller during spillage clean-up. The conveyor has now been stopped by the emergency lanyard.

The operator is conscious and appears to have suffered a compound fracture of the right arm.

- | | | |
|-----|--|-----------------|
| (a) | Describe the procedures you would use to rescue the injured person. | 4 marks |
| (b) | Describe the first aid procedures that you would institute. | 4 marks |
| (c) | Who would you inform of the accident? | 3 marks |
| (d) | When would you re-start that section of the plant? | 3 marks |
| (e) | What steps do you propose to prevent such an accident from recurring? | 6 marks |
| | Total | 20 marks |

QUESTION 2

You receive a call from a distraught truck driver whose truck has contacted an overhead powerline. He reports that he heard a bang and has stopped the truck under the powerline. The driver is in the truck cabin.

The contact with the powerline has occurred at the base of the waste dump, the line is on the ground, and there are three trucks on the same haul route.

- | | | |
|-----|--|-----------------|
| (a) | What do you do to make the area safe and protect other employees? | 8 marks |
| (b) | What procedures do you use to rescue the truck driver? | 4 marks |
| (c) | What do you do with the truck? | 4 marks |
| | Total | 16 marks |

QUESTION 3

You are in charge of an open pit operation. A truck driver reports that she has noticed a small crack opening up in the wall above the ramp.

- (a) Describe the actions you would take. **8 marks**
- (b) List eight (8) factors which could affect wall stability in open pits. **8 marks**

Total 16 marks

QUESTION 4

A member of the blast crew reports to you that smoke is emitting from some of the blast holes, one of which has been loaded with a primer and downline.

You know that black shale may be present, which can spontaneously combust, producing products of combustion.

Describe the actions you would take to rectify the situation, giving reasons for your decisions.

Total 16 marks)

QUESTION 5

You are the quarry manager of a medium sized granite quarry using conventional drill and blast techniques.

A number of misfires have occurred in the latest blast.

- (a) List five (5) possible causes for the misfires. **10 marks**
- (b) Describe three (3) methods of safely disposing of the misfired charges in the blast holes. **6 marks.**

Total 16 marks

QUESTION 6

You are required to prepare a Project Management Plan for a medium sized quarry, for submission to the State Mining Engineer.

- (a) **List eight (8) possible hazards that could occur at the mine.** **4 marks**
- (b) **What means would you consider for preventing or dealing with the above emergencies?** **12 marks**
- Total 16 marks**

QUESTION 7

You are the manager of a quarry adjacent to a small town.

Outline eight (8) main points that you would consider in reducing the flyrock from the blasting operations.

16 marks

END OF PAPER