

WESTERN AUSTRALIA

**RESTRICTED QUARRY MANAGER'S (NON-EXPLOSIVES)**  
**CERTIFICATE OF COMPETENCY**

**QUARRYING EXAMINATION**

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2 October 2013

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

**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.

**Advice to Candidates**

**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**

**AND FIVE OTHER QUESTIONS OF YOUR CHOICE**

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### **Question 1 (Compulsory question)**

An accident has occurred in a neighbouring open pit mine. It involved a truck driving through overhead power lines. You want to alert your personnel to the dangers involved in overhead power lines, and develop a safety talk to be given to all personnel on site.

(a) What are two major hazards when mobile equipment comes in contact with overhead power lines and how would you deal with them? **(10 Marks)**

(b) What preventative measures would you mention in your safety talk? (Remember that this safety talk is directed at both fixed plant personnel and the mobile equipment operators). **(10 Marks)**

**TOTAL: 20 Marks**

### **Question 2 (Compulsory question)**

a. Describe the surface mining operation where you are employed (or have been employed recently) using the following headings (if applicable).

- (a) General description and purpose of the operation
- (b) Loading
- (c) Haulage
- (d) Roads and dumps
- (e) Miscellaneous equipment and its functions
- (f) Dewatering
- (g) Lighting
- (h) Supervision
- (i) Environmental provisions

**12 Marks**

b. Suggest variations that will improve the operations (b)(c)(d) and (i) in terms of better efficiency, safer working and improved environmental control.

**8 Marks**

### **Answer any five (5) of the following questions**

#### **Question 3**

**12 Marks**

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**

**Question 4****12 marks**

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

1. bench height
2. bench
3. berm
4. toe
5. face angle
6. inter-ramp slope angle
7. overall pit slope angle

**(2 marks each)****Question 5****12 marks**

- 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 pile rehabilitation. Prepare a brief sketch to describe the technique.

**Question 6****12 marks**

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

**2 marks****10 marks****Question 7****12 marks**

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)

**Question 8****12 marks**

You are the newly appointed manager of a local quarry. The General Manager of the company has dismissed your predecessor for comments to the effect that "if the town's residents can't stand the noise living next to a quarry they should move out of town or wear ear plugs. This quarry 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 being received daily from neighbours about the noise generated from the quarry. 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 likely sources of noise in the plant and in the open pit.

**END OF PAPER**

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**WESTERN AUSTRALIA**  
**RESTRICTED QUARRY MANAGER'S CERTIFICATE OF COMPETENCY**  
**(NON-EXPLOSIVES)**

**QUARRYING EXAMINATION**

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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 OTHER QUESTIONS.**

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## QUESTION 1

As the newly appointed Quarry Manager of a mineral sands quarry, you have just completed your first inspection of the pit. A screening plant is located in the pit to remove +50mm oversize and the sands are pumped to a processing plant through a 250mm steel pipe line.

You noted the following:

The screening plant was completely surrounded by water and slimes to depths of 30cm;

Screen drive belt guards were on the ground and had been run over by the loader;

Several lights were broken;

The 250mm pipe line had blocked three times in the past two days resulting in 10 hours of lost production;

Operators complained of receiving electrical shocks from steel work;

Operator morale throughout the quarry was very low.

**What action would you take to ensure immediate safety?**

**6 marks**

**Detail a list of procedures you would implement to rectify the situation, and to bring the quarry and plant into safe operation.**

**14 marks**

**Total 20 marks**

## 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 (8 marks)

**Total 16 marks**

### QUESTION 4

A 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 limestone 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**



**WESTERN AUSTRALIA**  
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3 October 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 ARE REQUIRED TO ANSWER SIX (6) QUESTIONS.**
- **QUESTION 1 IS COMPULSORY.**
- **YOU SHOULD ATTEMPT QUESTION 1 AND FIVE (5) OTHER QUESTIONS.**

### **QUESTION 1 - COMPULSORY**

An accident has occurred in a neighbouring open pit mine. It involved a truck driving through overhead power lines. You want to alert your personnel to the dangers involved in overhead power lines, and develop a safety talk to be given to all personnel on site.

- (a) What are two major hazards when mobile equipment comes in contact with overhead power lines and how would you deal with them? **(10 Marks)**
- (b) What preventative measures would you mention in your safety talk? **(10 Marks)**  
*(Remember that this safety talk is directed at both fixed plant personnel and the mobile equipment operators).*

**TOTAL: 20 Marks**

### **QUESTION 2**

- (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)**
- (c) What safety precautions are necessary with respect to each method? **(4 Marks)**

**TOTAL: 16 Marks**

### **QUESTION 3**

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 4**

Fires are a frequent occurrence in surface mining operations.

- (a) List eight (8) potential causes of fire. **(4 Marks)**
- (b) Describe what precautions you would take to minimise the occurrence of each potential cause. **(12 Marks)**

**TOTAL: 16 Marks**

### **QUESTION 5**

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 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 6**

You are the quarry manager of a sand pit and screening plant, situated on the outskirts of a town.

During the weekend when the mine is not working, three children enter the lease and manage to start up the screening plant. One child is injured when the handbrake of a truck is released and the vehicle rolls down the ramp and hits the wall.

- (a) What action can you take to prevent a similar occurrence?

**TOTAL: 16 Marks**

### **QUESTION 7**

- (a) Before driving a light vehicle, what safety checks (pre-start and after start) must be made? **(10 Marks)**
- (b) What other precautions must be taken whilst driving a light vehicle and when leaving it parked in order to inspect the workplace? **(6 Marks)**

**TOTAL: 16 Marks**

**END OF PAPER**

**WESTERN AUSTRALIA**  
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**NON-EXPLOSIVES**  
**QUARRYING EXAMINATION**

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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

An accident has occurred in a neighbouring open pit mine. It involved a truck driving through overhead power lines. You want to alert your personnel to the dangers involved in overhead power lines, and develop a safety talk to be given to all personnel on site.

- (a) **What are the three major hazards when mobile equipment comes into contact with overhead power lines?** (3 marks)
- (b) **What preventative measures would you mention in your safety talk?(Remember that this safety talk is directed at both the plant personnel and the mobile equipment operators)** (15 marks)
- (c) **If an accident involving power lines did occur, who would the manager inform?** (2 marks)

**Total 20 marks**

## QUESTION 2

Outline eight (8) main points that are necessary for the safe dumping of waste material on a waste dump 30 metres high.

**Total 16 marks**

## QUESTION 3

Under the duty of care, employers are required to provide a worker with Personal Protective Equipment (PPE).

**List the PPE for a worker under your control who is working:**

- (a) **With abrasive blasting equipment** (4 marks)
- (b) **At night as a spotter** (4 marks)
- (c) **Around toxic chemicals** (4 marks)
- (d) **In a workshop doing welding** (4 marks)

**Total 16 marks**

#### QUESTION 4

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 5

Large numbers of incidents are routinely reported to the Department where fires occurred in surface operations.

- (a) List eight (8) potential causes of fire. (4marks)**
- (b) Describe what precautions you would take to minimise the occurrence of each potential cause. (12 marks)**

**Total 16 marks**

#### QUESTION 6

An electric shock, however minor it may appear, has the potential to be fatal.

- (a) Describe five (5) activities around the mine which could expose an employee to the dangers of electric shock, and briefly describe the circumstance(s) that would cause the accident. (10 marks)**
- (b) Describe the precautions that you would take to prevent electric shock. (6 marks)**

**Total 16 marks**

## QUESTION 7

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 8 x 2.5 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?** (3 marks)
  - (ii) **travelling on the ramp?** (3 marks)

**Total 16 marks**

**END OF PAPER**