

WESTERN AUSTRALIA

**RESTRICTED QUARRY MANAGER (EXPLOSIVES)
CERTIFICATE OF COMPETENCY**

QUARRYING EXAMINATION

28th April 2011

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 (COMPULSORY)

You have been appointed as quarry manager of a conventional drill, blast, load, haul quarry which mines rock with a high silica (quartz) content.

You have observed that the drill is fitted with a collar hood and flexible hose to direct the dust away from the driller, but that the dust tends to hang in the quarry.

You have also noted that considerable dust is generated during loading operations and from the roads, which are topped with fines from the crushing plant. The quarry has a water truck fitted with rear discharge sprinklers only, which is driven by a member of the blast crew when he has no charging duties to perform.

- (a) **If you decided to overcome the dust problem by employing a person to operate the water truck full time, would you then be complying with the law?** **1 mark**
- (b) **If you did nothing, what are the potential health effects on employees who continue to work in the quarry for a long period of time?** **2 marks**
- (c) **What should be done to control dust generation and its release to atmosphere:**
- (i) **during drilling?**
 - (ii) **during loading?**
 - (iii) **during haulage?**
- 9 marks**
- (d) **What additional practices, procedures or control mechanisms could be put in place to protect the operators of equipment, specifically:**
- (i) **the drill?**
 - (ii) **the front end loader during loading?**
 - (iii) **the trucks?**
- 3 marks**
- (e) **What are the most likely causes of significant dust generation during charging operations, and how can they be minimised?** **5 marks**

Total 20 marks

QUESTION 2

During a recent visit to the mine the Inspector had made a Record Book entry regarding the poor state of the mobile equipment fleet.

Prepare an inspection and maintenance program for the fleet on a daily, weekly, and monthly basis, so that the safety and health of the operators is not compromised.

16
marks

QUESTION 3

You have been given the task of scaling down the top three, 10 metre faces of a quarry over a 200 metre length, prior to commencement of a decline portal into the bottom of the third face. Berms are 4 metres wide.

Describe how you would carry out this task, bearing in mind that personnel will be developing the portal at the base of the face in the near future.

16 marks

QUESTION 4

A blast pattern of 34 holes has been drilled and charged with 9 holes in the front row, 8 holes in the second row, 9 holes in the third row, and 8 holes in the back row. The holes are offset between rows.

You are using slurry explosive, detonating cord, detonating relay connectors and boosters and are blasting to an open face. All detonating relay connectors have the same value.

The three holes in the middle of the first row are to be initiated first and the blast is to be timed so that no more than 9 holes are detonated at the same time in the first three rows and no more than 4 holes are detonated at the same time in the back row.

- (a) **Draw a diagram showing how you would tie up the shot and place the detonating relay connectors to achieve this using the minimum number of relays possible.** 10 marks
- (b) **How many detonating relay connectors would you require?** 2 marks
- (c) **Draw a section through a typical blast hole nominating its depth and diameter and how you would charge it.** 4 marks

Total 16 marks

QUESTION 5

A front end loader driver loading ore from a quarry face reports that he has uncovered the lower part of a blast –hole containing ANFO which has the remains of a cord-line hanging from it.

Describe the action you would take to deal with the matter safely, while maintaining production from the quarry.

16 marks

QUESTION 6

In hot and humid conditions the risk of heat stress or heat exhaustion is present, and may cause serious health problems, to the extent that death may occur.

(a) **As Manager, what are your responsibilities under the Regulations with regard to hot and humid conditions?**

6 marks

(b) **Summarise the factors you would discuss in an induction of new employees with regard to heat related problems.**

10 marks

Total 16 marks

QUESTION 7

Compressed air may be used in various locations on a mine site, such as in the sample preparation area, workshops and on the drills.

(a) **Describe the hazards that compressed air may present in all the areas of the mine.**

6 marks

(b) **As the Manager, what precautions and training would you introduce to reduce the hazards?**

10 marks

Total 16 marks

END OF PAPER

WESTERN AUSTRALIA
RESTRICTED QUARRY MANAGER'S EXPLOSIVES
QUARRYING EXAMINATION

29th September 2010

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

ADVICE TO CANDIDATES

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- Use sketches to describe your answers where appropriate.
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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 have been asked by the Quarry Manager to draw up a written blasting procedure for the quarry. Draw up a suitable procedure highlighting the safety issues you believe are most important, using the following headings as a guideline.

- (a) Preparation for charging up. (5 marks)
- (b) Charging up. (4 marks)
- (c) Connecting up. (4 marks)
- (d) Clearance for firing. (3 marks)
- (e) Firing the shot. (2 marks)
- (f) Clearance after firing. (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.

(16 Marks)

QUESTION 3

You have arranged for a front end loader and operator from an adjacent quarry to assist your quarry loading operations for a few days. The vehicle and operator have arrived ready to commence work. What checks would you make and what instructions and advice would you give to the operator before he commences work?

(16 Marks)

QUESTION 4

Drillers, whether exploration, sample or production, are exposed to a number of hazards.

- (a) List 4 hazards that could affect the driller. (4 marks)
- (b) What precautions would you take to minimise the danger to the drillers from the above hazards? (12 marks)

(TOTAL 16 Marks)

QUESTION 5

You are the quarry manager of a medium sized open pit which produces railway ballast, using drill and blast techniques. Water is available, but in limited quantities.

- (a) List 8 areas where dust could be generated. (8 marks)
- (b) For each area listed above, describe the method of dust control you believe would be most applicable. (8 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 week-end 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? (8 marks)
- (b) List additional issues associated with operating a quarry adjacent to a residential sub-division. (8 marks)

(TOTAL 16 Marks)

QUESTION 7

You are the quarry manager of an open pit operating trucks and loaders on several benches. A water truck is employed to water the roads and the stockpiles.

When the truck is being driven down the ramp the driver appears to lose control of the vehicle and skids on the wet surface, hitting the wall.

The driver is slightly injured. When you enter the truck cab to assist the driver, you notice a smell of alcohol and find a broken bottle of beer on the floor.

- (a) What policies would you adopt with regard to intoxicating liquor on the mine site? (4 marks)
- (b) Give 4 possible reasons for the accident. (4 marks)
- (c) How would you prevent such an accident from recurring? (8 marks)

(TOTAL 16 Marks)

END OF PAPER

WESTERN AUSTRALIA
RESTRICTED QUARRY MANAGER'S (Explosives)
CERTIFICATE OF COMPETENCY
QUARRYING EXAMINATION
8th April, 2010

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

ADVICE TO CANDIDATES

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- **Use sketches to describe your answers where appropriate.**
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- **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 - COMPULSORY

You have been asked by the Quarry Manager to draw up a written blasting procedure for the quarry. Draw up a suitable procedure highlighting the safety issues you believe are most important, using the following headings as a guideline.

- (a) Preparation for charge-up. (5 marks)
- (b) Charging up. (4 marks)
- (c) Connecting up. (4 marks)
- (d) Clearance for firing. (3 marks)
- (e) Firing the shot. (2 marks)
- (f) Clearance after firing. (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) On a powder crew (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 Quarry Manager in charge of an open pit 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 determine the thickness and strength of the pit floor.

Total 16 marks

QUESTION 5

In 2009 there were over 530 incidents 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.

In 2009 the surface mining industry reported more than 309 cases of electric shock

Under Regulation 5.17 a notice is required to be posted at the entrance of each enclosure used for the installation or maintenance of electrical equipment.

- (a) **Describe the points that should be covered by such a notice.** (6 marks)
- (b) **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)

Total 16 marks

QUESTION 7

A large rock is jammed in the mouth of a primary jaw crusher and it is necessary for the operator to blast the rock. The operator has only recently started work with the company.

As the quarry manager, what instructions would you give the operator to enable him to perform the task safely, and what precautions would you take?

Total 16 marks

END OF PAPER

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

29 September, 2009

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

ADVICE TO CANDIDATES

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- **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

You have been asked by the Quarry Manager to draw up a written blasting procedure for the quarry. Draw up a suitable procedure highlighting the safety issues you believe are most important, using the following headings as a guideline.

- (a) Preparation for charge-up. **(5 marks)**
 - (b) Charging up. **(4 marks)**
 - (c) Connecting up. **(4 marks)**
 - (d) Clearance for firing **(3 marks)**
 - (e) Firing the shot **(2 marks)**
 - (f) Clearance after firing. **(2 marks)**
- Total 20 marks**

QUESTION 2

- (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 16marks**

QUESTION 3

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 4

- (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 5

Incidents are frequently reported to the Department where fires occur in surface 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 6

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**
- (c) Describe three (3) methods of safely disposing of the misfired charges in the blast holes. **6 marks**

Total 16 marks

QUESTION 7

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

END OF PAPER