Sample written examination questions for coal mines (other than underground) blasting explosives user licence (BEUL) reference

Introduction

The sample questions for blasting calculations are provided to assist candidates to prepare for the written examination. Blasting calculation type questions in future written examinations may be similar to the samples provided but there may be a variation on them.

Candidates should set out their calculations in their answers in the written examination. The examiner will award marks for the calculations in the answer by the candidate to obtain the number required.

There are other types of questions that will be asked in the examination (refer to previous years examination papers) that could cover:

- Explosives mining legislation (licensing, handling, storage, transport etc)
- Safety mining legislation including shotfirer “duty of care”
- Explosives terms definitions
- Properties of explosives
- Explosives used in open cut coal mining
- Initiation systems used in open cut coal mining
- Design bench blast patterns
- How the shotfirer will manage different blasting incidents/situations.

If you have queries about the questions and how they are answered, then you should refer to suitably competent persons and organisations. The Resources Regulator as the assessor does **not** provide this information.

Question 1

A 15 m bench is required to be blasted for a large face shovel.
Due to wet conditions 1.2 density emulsion will be used.
The hole diameter is 251 mm and stemming is set to 20 times the hole diameter. The burden has been set to 7.0 m and the spacing set to 8.0 m to provide best fragmentation.
Calculate the powder factor for this blast. State any assumptions made.

Question 2

A 30 m bench is required to be blasted for a large face shovel.
The hole diameter is 270 mm and stemming is set to 20 times the hole diameter. The burden has been set to 8.0 m and the spacing set to 9.0 m to provide best fragmentation. The charging plan is to use a toe charge of 3 m of 1.3 density heavy ammonium nitrate fuel oil (ANFO) and a cap of 1 m of 1.2 density heavy ANFO. The remainder of the column is ANFO (density= 0.85).
Calculate the powder factor for this blast. State any assumptions made.

Question 3

A 20 m bench is required to be blasted for a large face shovel.
Due to dry conditions, ANFO (density= 0.85) will be used.
The hole diameter is 229 mm and stemming is set to 20 times the hole diameter. The planned powder factor is 0.48 kg/bcm.
Calculate the burden and the spacing for this blast. State any assumptions made.

Question 4

A 4.2 m deep parting shot is required to be blasted for an excavator.
Due to wet conditions 1.2 density emulsion will be used.
The hole diameter is 200 mm and the stemming is set to 3.3 m. The burden has been set to 4.0 m and the spacing set to 5.0 m to provide the tightest pattern available for the drill size.
Calculate the powder factor for this blast. State any assumptions made.

Question 5

A 10 m bench is required to be blasted for an excavator.
The hole diameter is 170 mm and stemming is set to 20 times the hole diameter. The burden has been set to 8.0 m and the spacing set to 10m to provide reasonable fragmentation. The charging plan is to use a toe charge of 3 m of 1.3 density heavy ANFO and the remainder of the column is ANFO (density= 0.85).
Calculate the powder factor for this blast. State any assumptions made

Question 6

A 25 m bench is required to be blasted for a large face shovel.
Due to dry conditions, ANFO (density= 0.85) will be used.
The hole diameter is 311 mm and stemming is set to 5 m. The planned powder factor is 0.50 kg/bcm.
Calculate the burden and the spacing for this blast. State any assumptions made.

More information on BEUL reference application

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