

**THE INSTITUTE OF MATERIALS, MINERALS & MINING**

**THE EXAMINATION IN MINING LAW  
RELATING TO HEALTH & SAFETY**

**14 JUNE 2006**

**Report by the  
Chief Examiner**

**MINING QUALIFICATIONS BOARD**

## SUMMARY

- The Mining Qualifications Board's Examination in Mining Law relating to Health & Safety was held on Wednesday, 14 June 2006 at Danum House, Doncaster.
- Eighteen candidates attended the Examination. This was a considerable increase in the numbers compared with last year, when there were seven candidates.
- Seven candidates were successful, having obtained the required Pass mark in both Section A and Section B of the Examination.
- Eleven candidates were unsuccessful with:-
  - seven candidates failing both Section A and Section B
  - four candidates failing Section B only, having attained a Pass in Section A
- On 15<sup>th</sup> June 2006 (day following the examination), the Deputy Chief Executive, Institute of Materials received a letter pointing out that Question B1(i) of Section B was not a syllabus question. This error was accepted by the Examiners and subsequent action taken by the Chief Examiner to ensure fairness of the marking for all candidates. This action is detailed in the Report.
- As Chief Examiner, I am satisfied that no candidate has been disadvantaged by this error.

# **The Examination in Mining Law Relating to Health and Safety - 14 June 2006**

## **Introduction**

- 1 The Examination was prepared using the syllabus for the year 2006, published by the Health and Safety Executive in June 2005. The Examiners, in preparing the paper, gave due regard to ensuring the content reflected the probable mix of engineering disciplines of candidates. The identity, place of employment, and the engineering discipline of candidates were not known to the Examiners.
  
- 2 The "Section A" syllabus includes Acts, Regulations and Approved Codes of Practice (ACOPs). A complete list of the Regulations with ACOPs highlighted is included in the syllabus. This indicates to the candidate the information he/she should have available for reference purposes during this "Open Book" section of the Examination. The reference to or use of "Guidance" documents should not be anticipated by candidates.

Examiners will ensure that Section A Questions, where possible, will require reference(s) to at least one of these ACOP Regulations and, in almost every question, a reference from the ACOP itself.

No reference to an "ACOP" or "Guidance" is required by any Question in Section B.

## **The Examination - 14 June 2006**

- 3 The Examination was held on Wednesday, 14 June 2006 at Danum House, Doncaster. A total of 18 candidates presented themselves for the Examination.

- 4 The format of the Examination remained the same as the previous year, with a Section A - Open Book, and a Section B - Closed Book.

Section A - 2 hours 30 minutes

*Candidates to attempt any 2 questions from  
4 questions available*

Section B - 1 hour 30 minutes

*Candidates to attempt any 4 questions from  
6 questions available*

- 5 Each of the two-part Examination serves a specific purpose:-

#### Section A

This is an “open book” examination which contributes a maximum of 60% of the total marks available to the candidate. This Section is designed to enable each candidate to demonstrate his/her knowledge of mining specific legislation and its practical application to a particular and realistic situation at an underground coal mine. The Examiners wish to see candidates “seek out” and “relate” the various Acts, Regulations and ACOPs accordingly. Particular emphasis is placed by the Examiners on the use of the ACOP material whenever possible. Candidates are recommended to provide their own annotated copies of the syllabus legislation. It is emphasised that reference to Guidance, Codes & Rules and individual Company Rules are not generally sought by the Examiners. It is possible that a part of a Question may seek:-

- ☐ action to prevent a recurrence
- ☐ good practice guidelines

In this instance, the Examiners would accept the candidates’ answers without need to “reference” any actual statement.

## Section B

This is a “closed book” examination which contributes a maximum of 40% of the total marks available to the candidate. Whilst the syllabus is large, it contains, in the main, mining specific legislation – Acts and Regulations, but no ACOP or Guidance material – the syllabus also includes “principal across the Board” Regulations which also apply to underground coal mines. No reference material may be taken into the Examination. Candidates are required to demonstrate a “working knowledge” only of related legislation which they should be able to recall without the aid of reference material. It is not the intention of Examiners to “catch out” candidates or use “little used or obscure” material for this Section.

Both the Section A and Section B Examinations for 2006 are attached to this report for information purposes.

- 6 In order to achieve an overall pass mark for the Examination, candidates were required to obtain not less than 50% of the possible marks in each Section A and Section B. As stated above, Section A questions are written in a manner so that candidates make use of ACOP material when possible.
- 7 In preparing the questions, cognisance was taken of topical and practical mining related events, together with the varying engineering disciplines of the potential candidates (not known by the Examiners). Some of the questions reflect real incidents and actual situations which have occurred at mines. The Examiners will continue to utilise their knowledge of such incidents wherever possible.

## **Candidates’ Performance in the Examination**

- 8 Seven of the eighteen candidates achieved the requisite Pass marks in both Section A and Section B. Most of the eighteen candidates demonstrated knowledge of “model answers” from previous years in that their presentation

generally conformed to that preferred by the Examiners. One candidate did exceptionally well in Section A but failed Section B in dismal fashion.

## **Section A**

9 Candidates' choices for Section A were:-

<u>Question</u>		<u>Topic</u>
A1	17candidates	Fire on an underground conveyor belt installation, following combustion of coal spillage. Fire occurred in a single intake situation.
A2	0 candidates	Fall of ground on a faceline that was being widened by Contractors prior to face installation.
A3	2 candidates	Explosion occurring in an auxiliary fan ventilated heading, resulting from a "nipped cable" during switchgear move-up.
A4	17 candidates	Explosion of firedamp with a number of possible ignition sources. Plan of underground workings provided to aid candidates.

10 Question A1

This was a very popular question being chosen by seventeen of the eighteen candidates. However, marks varied considerably between 7% - 90%. Eight of the candidates achieved marks varying between 7% - 45%.

The question detailed a conveyor fire being discovered by a belt patrolman and the subsequent events. The conveyor was sited in the single intake airway and the answers required of the candidates related to risk assessment,

fire protection plans, restrictions associated with single intakes and fire fighting.

Answers were to be found in:-

- Management of Health & Safety at Work Regulations 1999
- Provision and Use of Work Equipment Regulations 1998 \*
- Mines Miscellaneous Health & Safety Provisions Regulations 1995
- Mines (Safety of Exit) Regulations 1988 \*
- Mines (Owner's Operating Rules) 1993
- Mines (Fire & Rescue) Regulations 1956

\* *Regulation with ACOP*

Nine of the seventeen candidates who attempted the question fully understood what was required and gained quite high marks. However, some of the other candidates provided very poor answers and demonstrated both a lack of understanding of the question and perhaps an inability to systematically work their way through answers and fit them to the question. This was reflected in some of the marks achieved, even though the Examiner made every effort to award marks for answers that were "only just" acceptable. In several instances, marks were awarded to candidates using the wrong issue of the PUWER Regulations (1992 used instead of 1998). The later version is accompanied by an ACOP and candidates were obviously unable to reference that part of the question requiring an ACOP answer.

Candidates in general should also remember that risk assessments, as required by Regulation 3 of the Management of Health & Safety Regulations 1999 and any subsequent revisions of the assessment following a modification to equipment, are at the centre of modern Health & Safety legislation.

11 Question A2

No candidates attempted this question. Potential answers were to be found in:-

- Mines (Control of Ground Movement) Regulations 1999 \*
- Mines & Quarries Act 1954
- HSWA 1974
- Mines (Explosives) Regulations 1993
- RIDDOR
- MASHAM 1993
- Management of Health & Safety at Work Regulations 1999
- Mines (First Aid) Regulations 1981

*\* Regulation with ACOP*

12 Question A3

Two candidates attempted this question, attaining marks of 50% and 78% respectively.

The question provided a scenario of an auxiliary ventilated heading where the Official had noted a reduction in the ventilation quantity. With work operations suspended, the Official arranged for an “unplanned switch move up” to be undertaken whilst he investigated reasons for the reduced ventilation. On commencing the “move up” there had been an explosion of firedamp caused by a damaged cable igniting the gas that had collected.

Answers were to be found in:-

- Mines & Quarries Act 1954
- HSWA 1974
- Mines (Ventilation) Regulations 1956
- Mines Miscellaneous Health & Safety Provisions Regulations 1995
- MASHAM 1993 \*
- Electricity at Work Regulations “

*\* Regulation with ACOP*

One candidate provided answers in the form of two contraventions from the Managers and Officials Regulations that were repealed by the MASHAM Regulations in 1993 and were certainly not part of the Syllabus.

13 Question A4

This was very popular, with seventeen candidates attempting the question. Marks attained varied between 16% and 72%. A Schematic Plan of the underground workings was provided for candidates.

The Plan indicated detail recorded by the mine surveyor following an explosion of firedamp that probably originated “in or around” a development heading, which had not been ventilated for two days as a result of damage to the auxiliary fan.

Answers were to be found in:-

- Mines & Quarries Act 1954
- Ventilation Regulations 1956
- MASHAM 1993 \*
- (Precautions against Inflammable Dust) Regulations 1956
- (Safety of Exit) Regulations 1988 \*

\* *Regulation with ACOP*

Most questions relating to A4 had only one correct answer. This requires candidates to carefully read the question in order to understand its requirements. This was not always in evidence. Before answering any question, candidates should ensure they are confident they understand the scenario outlined, and recognise that facts placed in the question are there to direct the candidate to a particular part of the legislation they need.

A number of candidates failed to identify stone dust as a “Barrier” to propagation and restriction of the affected area of an underground methane gas explosion. Some candidates left whole parts of this question unanswered leaving very little leeway for Examiners when marking.

14 Overall, eleven candidates attained sufficient marks from their two attempted questions to achieve at least a 50% Pass for Section A. Of the remaining seven candidates, only two came within 10% of the requisite Pass, with 45% and 40% respectively. In both cases, their Section B results were very disappointing.

## **Section B**

15 Candidates' choices for Section B questions were:-

<u>Question</u>	<u>Candidates</u>	<u>Topic</u>
B1	13	<i>HSWA: Duties of manufacturers who supply articles for use at work</i> <i>MHSWR: Risk assessments</i>
B2	3	<i>Shafts and Winding Regs: Duties of manager re inspection, examination and maintenance of shaft and fixtures</i> - duty on use of shaft or fixture
B3	17	<i>Safety of Exit Regs: need for 2 shafts or outlets</i> - duties of manager when one exit is unavailable
B4	8	<i>Electricity in Mines:</i> - records and information requirements - introduction and use of battery powered vehicles
B5	16	<i>Firedamp Regs:</i> - safe transport and discharge on the surface of a mine
B6	15	<i>PUWER:</i> - maintenance and installation of work equipment <i>MASHAM:</i> - maintenance and installation of plant and equipment

- 16 As in previous years, the Examiners provided a mix of old/new legislation but with an emphasis placed on mining specific subject matters. It is interesting to note, however, that the most popular questions were split fairly evenly between:-

B1 (13)	HSWA & MHSWR	General and more modern style of legislation
B6 (15)	PUWER & MASHAM	
B3 (17)	Safety of Exit Regs	Mining specific subjects
B5 (16)	Firedamp Regs	

- 17 The day following the examination, The Institute of Materials, Minerals & Mining received a letter from the candidates' Tutor as follows:-

*“Question B1 (i) of Section B in yesterday’s MQB examination required the candidate to have knowledge of Section 6 of the Health & Safety at Work Act 1974. This section is not in the 2006 Syllabus for the HSE Examination in Mining Law Relating to Health and Safety as distributed by your office in June 2005. I have spoken to all the candidates after the examination and they have some concerns that this may have affected their performance in the examination.”*

This was accepted by the Examiners.

- 18 The Deputy Chief Executive, Dr Woodrow, informed the Chief Examiner accordingly. The Chief Examiner instructed each Examiner to mark candidates in the normal manner. Subsequently, the Chief Examiner, on receipt of all papers from each Examiner, set out a policy for the marking of Question B1 in a fair manner and which did not disadvantage candidates. This policy is outlined later in this report, together with a brief description of the process and subsequent action taken in informing candidates of the final decisions.

- 19 The overall performance of most candidates in Section B was extremely poor with very few candidates able to demonstrate a working knowledge of appropriate legislation in the provision of answers. Some demonstrated a thread of understanding, but overall it was very difficult to award marks to answers that had little substance or understanding of what was needed.
- 20 Two candidates attained marks of zero in answering Question B3 Safety of Exit Regulations - relating to the availability of “only one means of egress from the mine”). A further six candidates attained marks between 10% - 20% only for the same question. This is a basic and absolutely essential element of knowledge required of every Official of the Mine of the impact on the working of the Mine when only one exit is available for use. However, there appeared to be a lot of “guesswork”, and often there was very little written down for which marks could be awarded.
- 21 Question B4 (Electricity at Mines and Battery Powered vehicles) was answered relatively well with only two of the eight candidates who attempted this question attaining less than 50% of the marks available. However, it was evident that candidates benefited from Examiners awarding marks for answers making detailed reference to “charging stations”. Very few indicated that such vehicles need to be of an Approved type.
- 22 Question B5 (Firedamp Regulations relating to surface disposal/discharge of firedamp) was a very popular question. However, answers were of very mixed standard, with candidates once again demonstrating “guesswork” and lack of knowledge. Examiners were generous in the marking of this question.
- 23 Question B6 (PUWER and MASHAM relating to maintenance and inspection regimes) was also very popular. Most answers were vague with a lack of specific content to attract marks. Overall, candidates displayed a poor knowledge of maintenance and inspection legislation. If one considers that most candidates have probably been mechanical or electrical apprentices, it demonstrates concern as to their application of such an important regime in

the workplace. It is interesting to note, however, that five of the seven candidates who passed Section B did reasonably well with this question.

- 24 As stated earlier, Question B1, Part (i) was not part of the Syllabus issued to candidates. This was an error by the Examiners that became evident when the Examination Paper was seen by the candidates' Tutor. This was an elementary error for which the Examiners can only but apologise to candidates. The action taken by Examiners in the marking of candidates' papers has hopefully compensated for the error.
- 25 Question B1 was also a very popular question with thirteen of the eighteen candidates making an attempt.

Question B1

*HSWA 1974*

*i What are the three (3) duties placed on any person who designs, manufactures, imports or supplies any article for use at work?*

*Answer:*

*Ensure article is so designed and constructed to be safe and without risk in its use.*

*Carry out testing and examination as necessary.*

*Make available information about the use for which it was designed and tested.*

Part (i) related to Section 6(1) HSWA and accounted for a maximum 50% of the total marks available, Parts (ii) and (iii), MASHAM Reg 3(1) and 3(3) accounted for the remaining 50% of the marks available. Surprisingly, the original marks attained were consistent with those attained in other questions. However, to ensure fairness, the following action was taken by the Chief Examiner.

- The thirteen candidates who attempted Question B1 were awarded maximum marks for Part (i), i.e. they were allocated the difference between what they had already scored and the maximum possible.
- Parts (ii) and (iii) were in the Syllabus and marked accordingly.

26 Obviously, there remained the five candidates who did not attempt the “non-syllabus content” Question B1. A view had to be taken to ensure they were not disadvantaged, particularly in relation to their fellow candidates. However, of these five candidates:-

- 2 - obtained a Pass in Section B anyway
- 1 - had failed Section A and therefore could not pass the Examination
- 2 - even with increasing scrutiny of marking, it was very difficult to “search out” additional marks for Section B. The two candidates attained marks of 32.5% and 35% respectively. Even the award of maximum marks for one of their questions would not have attained the requisite 50% Pass.

Overall, therefore, the view taken was that these candidates were not disadvantaged.

## **Conclusion**

- 27 Seven candidates attained the necessary Pass mark needed in both Section A and Section B and therefore an overall Pass for the Examination.
- 28 It must be extremely frustrating for those other four candidates who achieved a Pass mark for Section A but who failed so badly in Section B. This was particularly so for candidate 608, who achieved 84% in Section A. I can assure these candidates that every effort was made to locate marks for each. Their frustration at failing was shared by each Examiner.

- 29 Overall, therefore, eleven candidates failed the Examination. Some failures, as stated above, relates in the main to Section B. It has been emphasised before that this Section does not require detailed answers. Examiners are seeking only a working knowledge expressed in “plain English” that demonstrates the application of the legislation.
- 30 In previous years “Sample Answers” have been provided for Section A only. The Chief Examiner intends to provide a similar format for Section B for this year.

	<b>No of Candidates</b>	<b>No of Passes</b>	<b>Pass Rate %</b>
<b>1989</b>	326	84	25.8
<b>1990</b>	169	82	48.5
<b>1991</b>	75	16	21.3
<b>1992</b>	75	38	50.7
<b>1993</b>	42	18	42.9
<b>1994</b>	22	10	45.45
<b>1995</b>	24	16	66.67
<b>1996</b>	29	10	34.48
<b>1997</b>	11	4	36.36
<b>1998</b>	12 (10 completed)	2	20
<b>1999</b>	No Examination		
<b>2000</b>	3	3	100
<b>2001</b>	17	6	35
<b>2002</b>	5	4	80
<b>2003</b>	17	9	53
<b>2004</b>	9	6	67
<b>2005</b>	7	4	57
<b>2006</b>	18	7	39