

THE INSTITUTION OF MATERIALS, MINERALS & MINING
THE EXAMINATION IN MINING HEALTH & SAFETY LAW 2008

Wednesday, 11th June 2008 - 10.00am - 1.00pm

SECTION A

(‘Open Book’) - Mining Legislation and its Application

- **Candidates are allowed to use, for reference, any of the permitted books, copies of Acts, Regulations and Approved Codes of Practice - any of which may be annotated - to answer questions in this Section.**
- This section carries 60 marks and comprises four (4) questions from which **TWO (2)** should be attempted. All questions carry equal marks.
- Candidates should note that in answering any question, you may be required to reference more than one set of Regulations and any associated ACOP.
- Candidates are recommended to thoroughly read the scripts and understand the requirements of the questions before answering.
- In order to pass the Examination, candidates are required to obtain not less than 50% of the marks in each of Section A and Section B.

Time Allowed: 3 hours

SECTION A

QUESTION A1

A 300m long retreat longwall face is entering the final weeks of its planned life. It is to be replaced by an adjacent retreat face on which will be installed the powered supports from the original face. The mine manager has called a meeting of his management team to plan the salvage of the longwall and the transfer of equipment. The salvage work is to be conducted by contract personnel rather than mine employees, using equipment designed and supplied by the mine owners. The manager is particularly concerned about the legal implications of a number of the salvage activities and has drawn up an agenda for the meeting in the form of a number of questions.

In answering the following questions:-

- state precise statutory references to **Acts and Regulations** quoted
 - **précis** the main points of the **Acts and Regulations** used
 - state the paragraph number of any **Approved Code of Practice (ACOP)** quoted
 - **précis** the content of the **ACOP** paragraph used
- i
- a) What are general requirements of two sets of **Regulations** with respect to any assessment of hazards and risk in the conduct of the face salvage operations, taking into account that many of the personnel involved are not direct employees of the mine?
 - b) **ACOPs** define the terms 'hazard', 'risk', 'extent of risk' and 'suitable and sufficient' with respect to the risk assessment process. What is the meaning of these terms?
- ii
- a) The plan of work in the salvage calls for the main gate end of the face to be enlarged in size (both height and width) to allow powered supports to be turned and lifted on to rail vehicles for transport to the new face. What do **Regulations** specify about the assessment of the stability of this excavation?
 - b) An **ACOP** suggests nine issues that should be included within this assessment. What are these?
- iii
- a) Engineers at the mine have designed a specialised lifting system to load the powered supports salvaged from the faceline on to rail vehicles at the main gate end for onward transport to the new faceline. Two sets of **Regulations** specify general requirements for this equipment. What are these requirements?
 - b) What do **ACOPs** state about the strength of the lifting arrangement?
 - c) What do **Regulations** state about the organisation of the lifting operations at face end?

iv

- a) The mine manager is required by an **Act** to put in place a system that specifies a number of factors in order to secure safe operations during the transport of the powered supports to the new face. What are the factors that require specification?
- b) The main gate is straight and has a level gradient. The manager anticipates a potential requirement for persons to travel along the main gate during vehicle movements. In these circumstances, what do **Regulations** state about the provision of refuge holes and adequate clearances between the locomotive, the vehicles and the roof and sides of the roadway?

v

- a) The manager has a concern to establish the level of skills held by the sub-contractors personnel. A **Regulation** restricts work being done at a mine by unskilled personnel. What are these restrictions?
- b) **ACOPs** specify training requirements appropriate for operatives on a salvage face. What are these?
- c) **Regulations** apply certain requirements to persons appointed to drive locomotives. What are these?

SAMPLE ANSWERS

QUESTION A1

i

(a)

Management of Health and Safety at Work Regulations 1999

Reg 3(1)

Every employer to make suitable and sufficient assessment of exposure at work of employees to risks to health and safety and risks to persons not in his employment

Mines Miscellaneous Health and Safety Provisions Regulations

Reg 4(1)

Owner of every mine to ensure no work is done unless health and safety document prepared which:-

- Demonstrates risk to which people are exposed have been assessed
- Demonstrates adequate measures, including measures concerning design, use and maintenance of mine and its equipment have been and will continue to be taken to safeguard health and safety at work

(b)

Management of Health and Safety at Work Regulations 1999

ACOP 11

Hazard - something that has the potential to cause harm
Risk - likelihood of potential harm from hazard being realised
Extent of Risk - likelihood of harm occurring, potential severity of that harm, population that might be affected.

ACOP 13

Suitable and sufficient - risk assessment should identify risks, level of detail proportionate to risk

ii

(a)

The Mines (Control of Ground Movement) Regulations 1999

Reg 5(a) (b)

- Manager shall ensure that all factors affecting likely ground movement are assessed for the purpose of identifying ground control measures
- Assessment recorded in a document

(b)

ACOP 14

- Geological information
 - Mechanical properties of rock types
 - Effect of vertical and lateral stresses
 - Likely extent and nature of ground movement to be controlled
 - Potential failure mechanisms
 - Possible effects on other working faces
 - Site investigation results
 - Previous experience, relevant historical data
 - Mine environment including effects of ground water
- (Maximum 4 marks for any four of the above)

iii

(a)

The Provision and Use of Work Equipment Regulations 1998

Reg 4(1)

Every employer shall ensure work equipment is so constructed and adapted as to be suitable for purpose

Reg 4(2)

In selecting work equipment, employer to have regard to working conditions and to risks to health and safety of persons and any additional risk it poses

Lifting Operations and Lifting Equipment Regulations 1998

Reg 4(1)

- Every employer shall ensure lifting equipment is of adequate strength and stability for each load having regard to induced stress at mounting or fixing points
- Every part of a load and anything attached to it and used to lift it, is of adequate strength

(b)

Lifting Operations and Lifting Equipment Regulations 1998

ACOP 98

To assess whether lifting equipment is adequate in strength take account of forces as well as weight of accessories

ACOP 99

Not to be susceptible to fracture wear or fatigue

ACOP 100

Appropriate factor of safety applied

(c)

Lifting Operations and Lifting Equipment Regulations 1998

Reg 8(1)

Every employer shall ensure lifting operations are properly planned, appropriately supervised and carried out in a safe manner

iv

(a)

The Mines and Quarries Act 1954

Section 37(1)

- standard height and width with respect to each length of roadway in which vehicles run
- specify maximum loads (weight, dimensions or other criteria)
- maximum number of vehicles coupled together
- maximum speeds

(b)

The Coal and Other Mines (Shafts, Outlets and Roads) Regulations 1960

Reg 57

- continuous clear space not less than 600mm between vehicles and road sides
- maximum speed of vehicles does not exceed 4.5 m/s

Reg 59(2)(b)

Refuge holes not to exceed 90 metres spacing

The Coal and Other Mines (Locomotive) Regulations 1956

Reg 7(2)

Vertical clearance above cab roof of 300 mm

v

(a)

The Management and Administration of Safety and Health at Mines 1993

Reg 23

No person shall do any work unless he has received adequate instruction or training and is competent, or he does so under instruction and supervision of competent person

(b)

ACOP 154

Face line work including roof support, advancing powered supports, dealing with roof abnormalities and support at the face end

ACOP 156

This work should be annotated on training certificates

(c)

The Coal and Other Mines (Locomotive) Regulations 1956

Reg 17(1)

- No person to operate locomotive unless appointed by the manager
- certificated as competent

QUESTION A2

A men and materials transport system from the shaft to a new district in a large safety-lamp mine is being planned.

The mine management proposes to employ a storage battery locomotive system for the major part of the route together with diesel powered free steered vehicles (FSV) at the inbye end where gradients will be steeper.

There are many legal requirements in Acts and Regulations relevant to the design and operation of this transport system.

In answering questions i to vii:

- state precise statutory references to **Acts and Regulations** quoted
- **précis** the main points of the **Acts and Regulations** used
- state the paragraph number of any **Approved Code of Practice (ACOP)** quoted
- **précis** the content of the **ACOP** paragraph used

- i** **Regulations** place duties on employers with respect to hazards and their risks to health and safety, what is required before any transport system is first put to use, and if it is subsequently modified?
- ii** When designing, planning and installing the transport system, what do **Regulations** and **ACOPs** require regarding the suitability of work equipment and its installation and location of use?
- iii** What legal power is given to the mine manager in an **Act** to secure the safe operation of vehicles used in the transport system, and what should be required to prevent the illegal carriage of persons?
- iv** What does the law specify about internal combustion engines used below ground in the mine?
- v** **Regulations** and **ACOPs** cover maintenance of plant and equipment. According to **ACOPs**, what category is particularly relevant to both the locomotive and FSV installations, and what should be included relevant to their braking systems?
- vi** What do **Regulations** require regarding the construction of tracks used for the carriage of persons and materials on the locomotive installation?
- vii** What **Regulation** addresses the additional health and safety requirements that are placed on an employer, what is specifically covered, and what **Regulation** describes the hydraulic fluid that may be used on equipment in the transport system?
- viii** State **six (6)** topics likely to be taken into account when making an assessment of risk of the battery locomotive system.

SAMPLE ANSWERS

QUESTION A2

i

The Management of Health and Safety at Work Regulations 1999

Reg 3(1)

Employer to make suitable and sufficient assessment of
(a) risks to health and safety of employees whilst at work
(b) risks to health and safety of persons not in his
employment arising out of the conduct by him of his
undertaking

Reg 3(3)

Assessment to be reviewed by employer if
(b) significant change in the matters to which it relates
and
where any changes are required they are made by
employer

ii

The Provision and Use of Work Equipment Regulations 1998

Reg 4(1)

Work equipment is constructed or adapted to be suitable for
purpose

Reg 4(2)

In selecting work equipment, employer shall have regard to
working conditions and to the risks which exist where
equipment is to be used and any additional risk posed by the
use of that equipment

ACOP 106

Work equipment is installed, located and used in such a way
as to reduce risks to users and other workers

iii

Mines and Quarries Act 1954

Section 37

The manager shall have power to make transport rules for vehicles and conditions used, securing safe operation and avoidance of bodily injury caused by the running thereof, and in particular

- (d) prohibiting the conveyance of persons in vehicles except in such circumstances and in accordance with rules that specify precautions to be observed when persons conveyed

iv

Mines and Quarries Act 1954

Section 83

No internal combustion engine (steam boiler or locomotive) shall be used below ground in a mine, otherwise in accordance with the provision of regulations or with the consent of an inspector

v

The Management and Administration of Safety and Health at Mines Regulations 1993

ACOP 90

(b) planned preventative maintenance (PPM)
PPM arrangements may be time based or condition based and schemes will probably be a combination of both

ACOP 92

The scheme should include:-
(c) examinations and tests to demonstrate that the system is and continues to be safe
e.g. braking systems etc

vi

The Coal and Other Mines (Locomotives) Regulations 1956

Reg 6(1)

- No locomotive to run except on tracks being ballasted and drained,
- rails weights as defined in para (2), sleeper distance 840mm, joints
- rails secured by fish plates, curves gradual and with raised outer or check rail or both

Reg 6(2)

Minimum weight 19kg/m or 5kg + 2.5kg for each tonne of greatest weight on pair of wheels on greatest weight of locomotive that runs

Reg 6(3)

Adjacent tracks on which locomotives and vehicles run laid to ensure a 300mm clearance, taking into account any swing of loco

vii

The Mines Miscellaneous Health and Safety Provisions Regulations 1995

Reg 6(1)

Subject to paragraph (2),
(a) every employer of persons at work at a mine shall ensure that the additional health and safety requirement in Part 1 Schedule 1 are complied with appropriate to mine features, nature and work carried out and to provisions of health and safety document

Part 1 Schedule 1

Work Permits

1(1) where necessary by the health and safety document, a system of work permits shall be introduced for hazardous operations which may interact with other activities

1(2) work permits shall specify conditions and precautions before, during and after the work concerned and shall be issued by employer or person in charge of those operations

Reg 8(1)

Subject to paragraph (2) the manager shall ensure so far as reasonably possible that only hydraulic fluids which are both difficult to ignite and satisfy any specifications relating to fire resistance and hygiene approved for the purpose are used at the mine

viii

Topics to be taken into account when making risk assessment for battery locomotive system

- 1) Compliance with legislation and codes of practice
- 2) Hazard identification
- 3) System of work
- 4) Training requirements
- 5) Specific risks between interaction of locomotive and FSV systems
- 6) Human error assessment

QUESTION A3

A small fire was detected in an outbye electrical substation of an underground coal mine where flammable material adjacent to the switchgear was ignited by an electrical fault associated with the incoming adaptor of the 1100v gate-end boxes. The fire was extinguished quickly using the fire fighting equipment situated on the intake side of the substation.

The equipment in the substation consisted of a transformer and gate-end boxes used to supply a set of pumps providing high pressure fluid to an adjacent salvage face which was still equipped with a full set of powered roof supports. The equipment was installed some 3 months earlier before face production had ceased.

The electrical fault on the incoming adaptor of the gate-end boxes was found to have initiated at one of the connections between the adaptor and the gate-end box busbars. It was concluded that the insulation had deteriorated over an extended period, and coincidentally, with an outbye power surge, the insulation failed and created a severe short circuit causing serious damage to the adaptor and resulting in the fire.

Further investigation of the system revealed a number of factors that contributed to the incident.

- a) The short circuit fault had been detected and cleared at an outbye substation.
- b) The transformer earth leakage and overload short circuit protection was found to be defective and had been defeated within the transformer low voltage chamber
- c) The planned maintenance office had no record of the electrical equipment being installed and therefore no weekly or periodic examinations had been issued during the life of the installation
- d) No defects were recorded for the equipment

In answering the following questions:

- state precise statutory references to **Acts and Regulations** quoted
 - **précis** the main points of the **Acts and Regulations** used
 - state the paragraph number of any **Approved Code of Practice (ACOP)** quoted
 - **précis** the content of the **ACOP** paragraph used
- i Outline **five (5)** provisions of **Acts** and/or **Regulations**, which may have been contravened in this incident when considering the planned maintenance
 - ii Identify **ACOPs** to support each of the **Regulations** described in your answer to i
 - iii Outline **five (5)** provisions of **Regulations** which should have been considered, during design, with respect to the safe operation of the electrical system
 - iv Identify **ACOPs** to support each of the **Regulations** described in your answers for iii
 - v What do **Regulations** require regarding the health and safety document to be held at the mine with respect to fire?

- vi** What are the duties of a manager, specified by **Regulations**, to secure the provision and readiness for immediate use in the case of fire
- vii** Explain, using reference to a **Regulation**, the circumstances that require the incident to be reported to the relevant enforcing authority.

SAMPLE ANSWERS

QUESTION A3

i & ii

Marks

Health & Safety at Work Act 1974

Reg 2 (2) (a)

The provision and maintenance of plant and systems of work that are, so far as is reasonably practicable, safe and without risk to health.

MASHAM Regulations 1993

Reg 11 (1) (a)

It shall be the duty of the manger to ensure that as far as is practicable that all plant and equipment are safely installed and commissioned

Reg 11 (1) (b)

It shall be the duty of the manger to ensure that as far as is practicable that all plant and equipment are systematically inspected, examined, tested and maintained

ACOP 83

The manager must ensure that all plant and equipment is safely installed and commissioned and systematically inspected, examined tested and maintained and, where necessary repaired renewed

Reg 11 (2)

The manager shall prepare and keep up to date a suitable written scheme for the systematic inspection, examination, testing, maintenance and where necessary repair of all plant and equipment.

ACOP 92 (c)

Examinations and tests which are necessary to demonstrate that the system is and continues to be safe e.g. ... insulation levels

ACOP 92 (d)

Examinations and tests on protective devices to ensure reliable operation, e.g. overload protection, thermal protection,

Reg 11 (4)

The manager shall ensure that, so far as is practicable, that suitable written reports are made of the inspections, examinations, tests, maintenance and repairs carried out in pursuance of paragraph (1) and that each such reports records significant defects and the steps taken to remedy them and is signed by the person making it.

ACOP 94

The manager should arrange a system for dealing with defects and reporting those which are significant.
Where plant is so defective that it is dangerous to use, the system should provide for the use of devices, such as defective-plant locks, to ensure that the plant is immobilised

iii & iv

Electricity at Work Regulations 1989

Reg 4 (1)

Systems work activities and protective equipment

All systems shall at all times be of such construction as to prevent, as is reasonably practicable, danger

ACOP 1

Construction should be interpreted widely. As well as covering the way individual items are assembled, it also covers the arrangement and connecting together, physically or electrically, of items to form an electrical system. In this sense the regulation embraces the planning of systems for safe operation

Reg 4 (2)

Systems work activities and protective equipment

As maybe necessary to prevent danger, all systems shall be maintained so as to prevent, so as is reasonably practicable, such danger

ACOP 2(f)

The construction of a system should be suitable with regard to the need for electrical or other forms of protection in the system

Reg 4 (3)

Systems work activities and protective equipment

Every work activity, including operation, use and maintenance of a system and work near a system, shall be carried out in such a manner as not to give rise, so as is reasonably practicable, to danger

ACOP 3(b)

The aim in planning and constructing a system should be to ensure it is planned, installed, protected, commissioned, tested and maintained, so as to prevent danger

ACOP 9

Below ground in mines or in other places where there would be undue danger in the event of fire, special precautions should be taken to minimise the effect of electrical short circuits

Reg 10

Connections

Where necessary to prevent danger, every joint and connection in a system shall be mechanically and electrically suitable for use.

ACOP 1 (b)

In making connections, so as to prevent danger, account should be taken of the need to avoid high resistances which can lead to overheating, arcing, fire

Reg 11

Means of protecting from excess current

Efficient means, suitably located, shall be provided for protecting from excess current every part of a system as may be necessary to prevent danger.

ACOP 7

For power systems where there is a high risk of fire, shock or ignition of flammable gas, limitation of the maximum prospective leakage fault current should be practised. The fault current and its duration should be limited to as low a value as is reasonably practicable to minimise the risk of shock or damage leading to incendive sparking or arcing

ACOP 8 (c)

In power systems in coal mines the following value of earth fault current limitation should be adopted on every system below ground operating at voltages between 650 and 1200 volts – 2 amperes maximum

Maximum of 5 ACOPs needed from the above list

v

Mines Miscellaneous Health & Safety Provisions Regulations 1995

Reg 4(5)

A fire protection plan detailing the likely sources of fire, the precautions to protect against, detect and combat outbreaks and spread of fires

vi

The Coal and Other Mines (Fire and Rescue) Regulations 1956

Reg 5

Manager to secure provision and readiness for use of

- a) an adequate supply of water; or
- b) sufficient fire extinguishers and supply of dust or sand;
- and
- c) equipment for conveying and using water, dust or sand

vii

The Reporting of Injuries, Diseases and Dangerous Occurrences Regs 1995

Schedule 2
Part I
Para 5

Where the failure of an item of electrical equipment results in a fire or explosion, the failure is reportable as a dangerous occurrence if the equipment concerned is rendered unusable for over 24 hours, or if the occurrence was one with the potential to cause the death of any person.

The incident is reportable even if the system in which the damaged equipment was installed is put back into service using new equipment within 24 hours. In such a case an assessment should be made on how long a repair to the damaged equipment would have taken had it been attempted

QUESTION A4

A large coal mine has a District of the mine, ventilated by a single intake airway and containing a short life (6 months) production retreat longwall and four drivages.

One drivage, some 800m long, equipped with a Dosco MK III Roadheader, is being driven to grade as a locomotive road. It frequently encounters sandstone bands and is known to encounter methane feeders. The drivage is classified as a High ITP (Incendive Temperature Potential) risk.

Each Friday, the night shift start time was allowed to “move forward” several hours. They would meet the afternoon shift leaving, almost in their working areas. The shift Officials invariably met each other at the locomotive manriding station where they conferred. In the case of the Dosco MK III drivage, this allowed the night shift men to begin work before their shift Official arrived at the face of the heading.

Near the end of the afternoon shift, the Dosco operator had been cutting with the MK III. He noted the dust backing up around the cutter head. Since it was near to the end of his shift, he stopped cutting and began to leave with the rest of his team. On the way outbye they met the oncoming shift and he informed the night shift Dosco operator that the cutter head should be checked. He then proceeded to the manrider but did not speak to his Official who was talking to the night shift Official.

The night shift machine operator began to examine the face of the heading. Realising the machine was almost “cut out” for support setting, he decided to finish the cutting, then set the support before checking the cutting head. Within a few minutes there was a series of sparks from the head followed by a large blue flame. This flame continued to burn across the face of the heading.

The operator tried to extinguish the flame using the machine water hose to no effect. The Official who had just arrived in the heading instructed everyone to leave and contacted the Surface Controller by tannoy on his way out of the heading.

The Controller initiated the Colliery Emergency Plan.

The fire eventually extinguished itself. Subsequent investigation showed:-

- some water sprays were blocked and several picks missing
- there were 93 men in the District at the time, some of whom were on the manset waiting to leave outbye
- there were 21 men in the heading
- the afternoon shift Dosco operator had told only the night shift operator about the cutter head
- there were no fire extinguishers in the heading
- some men from the coalface were unable to find their way out of the District and had to be located by a Rescue team

In answering the following questions:

- state precise statutory references to **Acts and Regulations** quoted
- **précis** the main points of the **Acts and Regulations** used
- state the paragraph number of any **Approved Code of Practice (ACOP)** quoted
- **précis** the content of the **ACOP** paragraph used

- i What is the duty of the machine operators as employees set out in **Regulations** which could have prevented the incident? Support your answer with the content of **two (2) ACOP** references.
- ii What are the responsibilities of the Owner required by **Regulations** specifically designed to prevent an ignition of methane?
- iii What do **Regulations** require of the Manager to prevent cutting machinery causing such an ignition of gas and what should he have provided for fire fighting in this case?
- iv What do **Regulations** require:-
- a of the person in charge in case of an outbreak of fire?
- b when determining the part of the mine affected by the fire?
- v Identify the **Regulation** which enables the Manager to be able to employ the number of men in the District at that time.
- vi a Quote the appropriate **Regulation** which sets out the responsibility of the Manager to ensure a safe evacuation of the mine.
- b What **Regulation** should he have regard to in order to discharge this responsibility?
- c Referring to an **ACOP** only, what must the Manager set up to control and take charge of such an incident at the mine?
- vii Identify the **Regulations** apparently contravened by the number of men found to have been working in the heading at the time of the incident.
- viii a What **two (2) Regulations** require the Manager to ensure every person who works underground is familiar with the way out to the shaft from his place of work?
- b What does an **ACOP** state in relation to the way out from a longwall face if the face lasts only 6 months?
- ix What are the **three (3) Regulations** specifying the Manager's duty with respect to Training and Information for appropriate actions by all persons who work at the mine in the event of an emergency situation arising?
- No reference to legislation is required when answering this part.**
- x List **four (4)** actions the machine operator(s) or Officials could have taken which would probably have prevented this incident.

SAMPLE ANSWERS

QUESTION A4

i

MASHAM 1995

Reg 5(3)

Where an employee discovers that a danger has arisen, or is about to arise (including a danger arising from a defect in, or the condition of, any plant or equipment at the mine) he shall:-

- a) take immediate steps as are reasonable for someone in his position to prevent danger that has arisen or is about to arise; and
- b) where further action is required, forthwith report the matter to a person in the management structure, normally his supervisor

ACOP 19

Employees can contribute to safety by their vigilance, self discipline and careful performance of their duties. They should co-operate with the Manager and the systems of safe working that he has set up.

ACOP 20

Employees should be alert to spot danger and report it to their supervisors or take remedial action as lies within the scope of their duties and competence.

Possible alternative answer with Reg 14, Management of Health & Safety at Work Regulations 1999

ii

The Coal Mines (Owner's Rules) Regulations 1993

Reg 3(1)

Owner shall ensure no mine is worked unless there are in force rules made by the Owner that are in writing and have been notified to HSE.

Reg 3(2)

Owner shall ensure:-

- a) rules brought to the attention of all persons affected by them
- b) operations are undertaken in accordance with the rules and observed by everyone

iii

The Coal Mines (Fire and Rescue) Regulations 1956

Reg 7

Where machinery for cutting mineral is in use at which an ignition of gas has been, or is liable to be produced, it shall be the duty of the Manager to secure:-

- a) the machine is provided with effective means to prevent such an ignition
- b) a portable fire extinguisher or supply of dust carried on the machine.

iv

The Coal and Other Mines (Fire and Rescue) Regulations 1956

a

Reg 11(1)

If a fire has broken out below ground at any place, the persons in charge of any parts of the mine likely to be affected by the fire, by smoke or by any explosion resulting, shall cause all persons to leave

b

Reg 11(4)

The parts of the mine affected by a fire are:-

- all parts of the seam in which the fire exists

v

The Mines (Safety of Exit) Regulations 1988

Reg 9

The Manager shall ensure that, apart from those persons who are going to or leaving their place of work at the beginning and end of a shift, not more than 50 persons are employed in the District.

vi

Escape and Rescue from Mines Regulations 1995

a

Reg 4(1)

The Manager shall prepare and maintain a written plan (Emergency Plan) setting out the actions to be taken to effect safe and prompt evacuation and rescue of persons from the mine should an emergency situation occur.

b

Reg 4(2)

In preparing the Emergency Plan, the Manager shall have regard to any relevant risk assessment made in accordance with Reg 3 of the 1999 Regulations.

c

- ACOP 16 Plan should set out the incident control arrangements. There should be a single person in overall charge - normally the Manager.
- Plan needs to provide for member of the management structure to:-
- a) take overall control of the incident if Manager not available
 - b) take immediate charge of underground incident operations.

vii

(Safety of Exit) Regulations 1988

- Reg 7(5)(c) Where Manager decides that more than 9, but no more than 18 persons work in a heading, he makes suitable rules for safe working.

viii

(Safety of Exit) Regulations 1988

a

- Reg 7(2) Manager to ensure that each way to a shaft is clearly marked.
- Reg 7(3) Manager to make and operate a suitable scheme to familiarise every person with at least two ways out of the mine

b

- ACOP 28 Manager's Scheme should ensure persons travel out at the earliest practicable opportunity.

ix

Escape and Rescue from Mines Regulations 1995

- Reg 11(1)(a) Manager ensures that all persons are trained in the appropriate actions in event of an emergency and in the use of equipment to be used, and he ensures practices are held at regular intervals.
- Reg 11(2) Manager ensures all persons receive appropriate written instructions and information on actions as appropriate to provisions of the emergency plan.
- Reg 11(3) Manager ensures a copy of the emergency plan is kept in the covered accommodation.

x

Actions that could have been taken to prevent the incident.

- Afternoon shift operator checked cutting head
- Night shift operator checked cutting head
- Afternoon shift operator inform Official
- Either operator immobilise Dosco

THE INSTITUTION OF MATERIALS, MINERALS & MINING
THE EXAMINATION IN MINING HEALTH & SAFETY LAW 2008

Wednesday, 11th June 2008 - 2.00pm - 3.30pm

SECTION B

(Closed Book) - 'Mining Legislation'

- **CANDIDATES ARE NOT PERMITTED TO USE ANY BOOKS OR NOTES IN ANSWERING THIS SECTION.**
- This Section carries 40 marks and comprises six questions from which **FOUR (4)** should be attempted.
- **In answering this Section, no reference from the content of any Approved Codes of Practice (ACOPs) is required.**
- In order to pass the Examination, candidates are required to obtain not less than 50% of the marks in each of Section A and Section B.

Time Allowed: 1 hour 30 minutes

QUESTION B1

The Mines and Quarries Act 1954 sets out general requirements with respect to the ventilation of a coal mine and the withdrawal of workmen in the case of dangers presented by inflammable gas.

- i** What is the duty of the mine manager with regard to the ventilation of the mine?
- ii** What are the specific requirements of the Act that define the adequacy of ventilation?
- iii** What is the duty of the mine manager with regard to the avoidance of danger from gas in the waste?
- iv** What are the requirements of a section of the Act with respect to the duty of a person in charge of part of a mine if excessive concentrations of inflammable gas are present?
- v** What percentage is defined as an “excessive” concentration of inflammable gas in a safety lamp mine.

SAMPLE ANSWERS

References to Legislation shown to aid revision only

QUESTION B1

Mines & Quarries Act 1954

i

Section 55(1)(a)(b) Manager's duty to ensure that there is constantly produced in all parts of the mine adequate ventilation to:-

- dilute inflammable and noxious gases to render them harmless and remove them, and provide air containing sufficient oxygen

ii

Section 55(2)(a)(b) and (3) Ventilation adequate if:-

- diluting carbon dioxide to less than 1.25%
- oxygen not less than 19% of general body
- maintenance of working conditions that are reasonable with regard to
 - temperature
 - humidity
 - amount of dust

iii

Section 56(2)(a)(b) Duty of Manager to ensure that there is constantly produced in the waste, adequate ventilation and that appropriate steps are taken to minimise dangerous emissions of inflammable and noxious gas from waste

iv

Section 79(1)(a)(b)(3) and (4) Person in charge of part of a mine should:-

- cause all persons employed that are affected to leave
- inform his immediate superior
- inform person in charge of any other part of the mine likely to be affected
- ascertain conditions in affected area and the measures necessary to be taken to render it safe
- not to allow re-entry unless to save life
- putting into place safety measures and establishing the success of these measures
- record events in a book provided by the owner

v

Section 79(5) 2%

QUESTION B2

- i **The Mines & Quarries Act 1954** includes a section which relates to the use of engines. What does the Act require with respect to the use of engines below ground?

- ii **The Electricity at Work Regulations 1989** includes a **Regulation** applying to mines only; describe the requirements with respect to:
 - a Battery powered vehicles

 - b Electrical storage batteries

SAMPLE ANSWERS

Reference to Legislation shown to aid revision only

QUESTION B2

i

Marks

The Mines and Quarries Act 1954

Section 83 No internal combustion engine, steam boiler or locomotive shall be used underground in a mine other than in accordance with the provision of regulations in that behalf, or with the consent of an Inspector

ii

Electricity at Work Regulations 1989

Reg 26 No locomotive or vehicle which uses an electrical storage battery, either partly or wholly, as a power source for traction purposes shall be introduced below ground at a safety lamp mine unless it is an approved locomotive or vehicle

Reg 27 At any mine in which electrical storage batteries are used below ground, those batteries shall, so far as is reasonably practicable, be used, stored, charged and transferred in a safe manner

QUESTION B3

Part 1 of **The Health and Safety at Work etc Act 1974** refers to the general duties of employers to their employees whilst at work.

- i What is the general duty of an employer and what, in particular, are the **five (5)** matters to which that duty extends?
- ii What are the requirements of any statement of an employer's policy with respect to health and safety at work of his employees?

The Management of Health and Safety at Work Regulations 1999 require an employer to make risk assessments with regard to health and safety.

- iii What persons should they cover?
- iv When should they be reviewed?

SAMPLE ANSWERS

Reference to Legislation shown to aid revision only

QUESTION B3

i

The Health and Safety at Work etc. Act 1974

Sec 2 General duties of employers to their employees

Section 2(1) duty of every employer to ensure, so far as reasonably practicable, the health, safety and welfare at work of all his employees

Section 2(2) the matters to which that duty extends:

(a) provision and maintenance of plant and systems of work that are safe and without risks to health

(b) arrangements for ensuring safety and absence of risks to health in connection with use, handling, storage and transport of articles and substances

(c) provision of information, instruction, training and supervision to ensure the health and safety at work of his employees

(d) so far as reasonably practicable as regards any place of work that it is safe and without risks to health and provision of access and egress that are safe and without risks

(e) provision and maintenance of working environment for employees that are safe, without risks to health, and adequate regarding facilities and welfare at work

ii

Section 2(3) • Prepare and revise, as appropriate, a written statement with respect to health and safety at work
• the organisation and arrangements for carrying out that policy
• bring statement and any revision to the notice of all employees

iii

The Management of Health and Safety at Work Regulations 1999

Reg 3 Risk Assessment

Reg 3(1) employer shall make suitable and sufficient assessment of the risks to:-

- his employees to which they are exposed to at work
- persons not in his employment arising from conduct by him or his undertaking

iv

Reg 3(3) Any assessment shall be reviewed if:-

- there is reason to suspect it is no longer valid
- there has been a significant change

QUESTION B4

The Mines (Shafts and Winding) Regulations 1993 place a duty on the **suitability of winding apparatus**.

- i Who is it placed on, what is the specific duty, and what are the **(7) seven** aspects that must be included?

The above **Regulations** also place duties with respect to the **examination, inspection, maintenance and testing of winding apparatus**.

- ii What are the duties placed on the manager of a mine and the persons he appoints in this **Regulation**?

SAMPLE ANSWERS

Reference to Legislation shown to aid revision only

QUESTION B4

i

The Mines (Shafts and Winding) Regulations 1993

Reg 10

Suitability of winding apparatus

owner shall ensure winding apparatus is suitable for purpose used, and has effective and suitable

brakes;

brake locking and interlocking devices;

means of controlling power to winding engine

means of preventing an overwind

means of preventing a conveyance or counterweight travelling at an excessive speed

means of safely stopping and holding a conveyance or counterweight in event of an overwind

means of monitoring the movement of every conveyance in the shaft

ii

Reg 17

Examination, inspection, maintenance and testing of winding apparatus

1) manager shall ensure winding apparatus is regularly & adequately examined, inspected, tested and maintained in accordance with suitable written scheme

2) manager shall appoint sufficient competent persons to regularly examine, inspect, test and maintain the winding apparatus

3) Each person appointed under 2) shall write a report setting out any defects he finds

QUESTION B5

The Coal Mines (Firedamp Drainage) Regulations 1960 set out requirements for the capture of methane from the strata.

What do these **Regulations** state about:-

- i** the drilling of boreholes for this purpose?
- ii** the design and installation of standpipes?
- iii** the design and installation of pipe ranges?

SAMPLE ANSWERS

Reference to Legislation shown to aid revision only

QUESTION B5

The Coal Mines (Firedamp Drainage) Regulations 1960

i

Reg 5(1)

Before a borehole is drilled to capture methane, manager to ensure that there is available a pipe to collect and convey the methane to a point where it can be discharged safely

Reg 5(2)

No person shall drill a borehole unless a device which can seal the borehole in the event of a sudden flow of firedamp is installed as soon as there is sufficient depth of hole

Reg 5(3)

Before drilling in stone, ensure water is running through drill rods and that water continues to flow throughout the drilling operations and is flowing out of the mouth of the borehole

Reg 6

Manager to ensure facilities are provided in every borehole to measure the volume of inflammable gas

ii

Reg 7

Manager shall make and ensure the carrying out of arrangements that each stand pipe is inserted and sealed to minimise leakage and joined to the pipe range by a flexible connection

iii

Reg 8

No firedamp drainage pipeline shall be installed in any intake shaft or outlet and each pipe range is so designed and constructed to permit samples to be taken and water to be drained
It must be adequately supported and have a yellow band near each joint

Reg 9

Manager to ensure that pipes are connected to any firedamp range in a way which minimises air being drawn into the range

QUESTION B6

The **Escape and Rescue from Mines Regulations 1995** sets out the responsibilities for the Owner, the Manager and Every Person at the mine with regard to **Arrangements for Escape**.

- i** Where necessary, what items must the Owner provide?
- ii** What must the Manager ensure?
- iii** What must Every Person at the mine ensure in order to comply with the escape arrangements put in place by the Owner?

SAMPLE ANSWERS

Reference to Legislation shown to aid revision only

QUESTION B6

The Escape and Rescue from Mines Regulations 1995

Reg 10 - Arrangements for Escape

- i** Owner shall provide where necessary:-
 - (a) suitable self rescuers for all persons going below ground
 - (b) safe havens or facilities for the exchange and recharge of self rescuers

- ii** Manager shall ensure:-
 - (a) every person issued with a self rescuer has been instructed in its use and does not go below ground without it
 - (b) self rescuers are regularly checked, and maintained in good condition and stored in a suitable place

- iii** Every person at a mine shall keep his self rescuer with him and available for use at all times when he is below ground