

Question 1

You are the manager of a mine, an inspector arrives at your mine. What are the inspector's powers? Mention 10. (10)

50. Inspectors' powers

- (1) An *inspector* may for the purposes of monitoring or enforcing compliance with *this Act*-
 - (a) enter any *mine* at any time without warrant or notice;
 - (b) enter any other place after obtaining the necessary warrant in terms of subsection (7); and
 - (c) bring into and use at any *mine*, or at any place referred to in paragraph (b), vehicles, equipment and material as necessary to perform any function in terms of *this Act*.
- (2) While the *inspector* is at any *mine* or place referred to in subsection (1), the inspector may, for the purposes of monitoring or enforcing compliance with *this Act*-
 - (a) question any person on any matter to which *this Act* relates;
 - (b) require any person who has control over, or custody of, any document, including but not limited to, a plan, book or record to produce that document to the *inspector* immediately or at any other time and place that the *inspector* requires;
 - (c) require from any person referred to in paragraph (b) an explanation of any entry or non-entry in any document over which that person has custody or control;
 - (d) examine any document produced in terms of paragraph (b), and make a copy of it or take an extract from it;

- (e) inspect-
 - (i). any article, *substance* or *machinery*;
 - (ii). any work performed; or
 - (iii). any condition;
- (f) inspect arrangements made by the *employer* for *medical surveillance* of *employees*;
- (g) seize any document, article, *substance* or *machinery* or any part or sample of it; and
- (h) perform any other *prescribed* function.

- (3) An *inspector* may instruct any *employer*, *employee* or any other person who performs an activity regulated by *this Act* or any former *employer* or *employee* or person who formerly performed an activity regulated by *this Act*, to appear before the *inspector* to be questioned on any matter to which *this Act* relates.
- (4) Before an *inspector* may seize any document under subsection (2) (g), the *employer* of the *mine* may copy it.
- (5) An *inspector* may remove any article, *substance* or *machinery* or any part or sample of it from any *mine* or place referred to in subsection (1) for examination or analysis.
- (6) When an *inspector* seizes or removes any item under this section, the *inspector* must issue a receipt for that item to the *employer* of the *mine* or place involved.

- (7A) The *Inspector* may impose a prohibition on the further functioning of the site where-
 - (a) a person's death;
 - (b) serious injury or illness to a person; or
 - (c) a health threatening occurrence, has occurred by blocking, barring or barricading the site in such a manner as the *Inspector* may deem necessary.

[NB: A sub-s. (7A) has been inserted by s. 16 of the Mine Health and Safety Amendment Act 74 of 2008, a provision which will be put into operation by proclamation.]

- (8) For the purpose of this section, '*mine*' does not include any home, or residential quarters, situated at the *mine*.

Question 2

An inspector of mines has issued the mine where you are working with an instruction. By whom and how must the Inspector of Mine's instructions be conveyed to the employees? (10)

56. Instructions to be posted at mine

The *employer* of a *mine* must-

- (a) promptly supply a copy of any instruction of an *inspector* to-
 - (i). the *health* and *safety representative* representing the *employees* affected by the instruction; and
 - (ii). the *health* and *safety committee* responsible for those *employees*; and
- (b) promptly publicise the instruction by-
 - (i). prominently and conspicuously displaying copies of the instruction to the *employees* whose interests may be affected; and
 - (ii). causing its contents to be communicated orally to those *employees*.

Question 3

The mine is busy installing scraper and mono winches. What safety measures must the employer include during installation of scraper and mono winches to ensure persons are not injured? (10)

- (2) The measures to be taken by the *employer* in terms of regulation 8.4(1) must include measures to ensure that-
- (a) scraper-winches and mono-rope winches are only operated by competent persons authorised by the *employer* to do so;
 - (b) the scraper winch or mono-rope winch is not operated until it is examined and declared safe to operate by a person authorised to do so by the *employer*;
 - (c) means are provided to forewarn persons of the intention to commence operating any scraper-winch or mono-rope winch;
 - (d) means are provided for persons to signal to the operator, from any access point to the installation, to shut down the operation of the scraper winch or mono-rope winch installation;
 - (e) scraper winch and mono-rope winch ropes, scraper attachments and rope splicing are regularly inspected;
 - (f) the scraper winch ropes are always underlay;
 - (g) a written procedure is prepared and implemented for the installation of the winch system, covering at least-
 - (i). the requirements of scraper and mono-winch foundations and installations;
 - (ii). the crossover and anti-fouling arrangements of ropes from two or more winches;
 - (iii). illumination of the moving parts of any winch so that they can be identified by persons;
 - (iv). appropriate sheave and return pulley anchor and rigging arrangements, including the use of safety slings;
 - (v). measures to ensure that winch ropes are used within the design capacity;
 - (vi). winch starter box location to ensure ease of operation by the operator; and
 - (vii). the moving and transport of winches from one location to another.

Question 4

You have been appointed as the engineer at the mine, what are your duties? (10)

2.13.4.1 An engineer or competent person appointed in terms of regulation 2.13.2 shall-

- (a) subject to regulation 2.13.12, be responsible for the safe installation and the proper operation, running and maintenance of all machinery;
- (b) be responsible for the safe erection and proper maintenance of all buildings, structures and tanks;
- (c) take all reasonable measures to ensure that-
 - (i). all safety appliances, mechanisms and guards are maintained in good condition;
 - (ii). the provisions of the regulations relating to machinery are fully complied with; and
 - (iii). the working of any apparatus or machine, the using of which may constitute a danger to any person, is stopped.

Question 5

Define the following in terms of Section 102 of the Mine Health and Safety Act.

"engine"	(4)
"manager"	(2)
"reasonably practicable"	(4)

'engine' means any appliance or combination of appliances by which power, other than human or animal power, can be applied to do mechanical work;

'manager' means any competent person appointed in terms of section 3 (1) (a);

'reasonably practicable' means practicable having regard to-

- (a) the severity and scope of the *hazard* or *risk* concerned;
- (b) the state of knowledge reasonably available concerning that *hazard* or *risk* and of any means of removing or mitigating that *hazard* or *risk*;
- (c) the availability and suitability of means to remove or mitigate that *hazard* or *risk*; and
- (d) the costs and the benefits of removing or mitigating that *hazard* or *risk*;

Question 6

A copper plate must be installed on a new boiler. What are the dimensions of the copper plate, how is it installed and what is stamped on it and by whom? (10)

22.6.2 Every boiler shall be provided with a soft copper plate, 100 millimetres by 60 millimetres in size by three millimetres thick, which shall be fixed by means of four copper rivets, 10 millimetres in diameter, to the front of the boiler shell and in a position so that it can be readily seen at all times. The rivet holes in this plate shall be countersunk so that the rivet heads are flush with the copper plate. The Principal Inspector of Mines shall stamp on this plate in a clear manner the official number, the year when the boiler was first inspected and the authorised working gauge pressure.

The copper rivet heads shall be stamped by the Principal Inspector of Mines with the official stamp. The copper plate shall not be removed and the record stamped thereon shall not be defaced or altered except by the regional mining engineer.

Question 7

You are the engineer in charge of the winding plant on the mine. Name 10 dangerous occurrences with regard to winding plant that need to be reported? (10)

- (i). Running out of control of winding-engine, winding drum or conveyance;
- (ii). Fracture or failure of any essential part of the winding-engine, fracture or failure of any safety device used in connection with the winding equipment;
- (iii). Fracture, failure or serious distortion of winding rope, fracture, failure or serious distortion of any connection between the winding rope and the drum or between the winding rope and the conveyance and any other load suspended from or attached to such rope; fracture or failure or serious distortion of any connection between conveyances or between a conveyance and any suspended or attached load, fracture of guide rope or its connections, fracture of balance or tail rope or its connections;

- (iv). Fracture or failure of winding or balance sheave; fracture or failure of any essential part of the headgear or other sheave support;
- (v). Jamming or accidental overturning of conveyance; conveyance or its load fouling shaft equipment; jamming of crosshead;
- (vi). Derailing of conveyance;
- (vii). Conveyance, bridle, frame or crosshead accidentally leaving guides;
- (viii). Fracture or failure of the braking system or of any critical parts thereof;
- (ix). Failure to activate when required of any safety catches and/or arresting devices or activation of any safety catches and/or arresting devices when not required;
- (x). Failure to activate when required of any overwinding prevention device or activation of such device when not required;
- (xi). Any overwind or over-run of the conveyance to an extent which may have endangered persons or may have caused damage to the winding equipment;
- (xii). Failure of depth indicator.

Question 8

What must be included in the measures taken by the employer to ensure that no person is injured because of the failure of any dam wall, plug or barricade keeping water back underground? (10)

10.2 Water storage and pumping regulations

- (1) The *employer* must take reasonable measures to ensure that no person is injured as a result of the failure of any dam wall, plug or barricade keeping back water underground due to inappropriate design, sub-standard construction, or inadequate inspection and maintenance of such dam wall, plug or barricade.
- (2) The measures to be taken by the *employer* to comply with regulation 10.2(1) above, must include measures to ensure that-
 - (a) any dam wall, plug or other barricade keeping back water underground, where the product of the capacity in cubic metres and the hydraulic head in metres of the dam storing water underground and of which they form part, exceeds 50 000, is designed by and constructed under the supervision of a competent person;

- (b) any dam wall, plug or barricade contemplated in subregulation (a) above is maintained by a competent person²;
- (c) any dam wall, plug or other barricade keeping back water underground, where the product of the capacity in cubic metres and the hydraulic head in metres of the dam storing water underground and of which they form part, does not exceed 50 000, is designed, constructed, inspected and maintained under the supervision of a competent person²; and
- (d) all design calculations and drawings of dam walls, plugs and barricades and mine plans indicating the exact position of such dam walls, plugs and barricades are stored safely for the life of such dam walls, plugs and barricades and are readily available.

Question 9

The guideline for the compilation of a mandatory code of practice (COP) for trackless mobile machines requires that the mine's COP describes the health and safety provisions applicable to each type of trackless mobile machine. What provisions must be covered?

(10)

8.11 Health and safety provisions on trackless mobile machines

In order to ensure that health and safety provisions on **trackless mobile machines** are appropriate for the specific circumstances at the mine, the **COP** must describe the health and safety provisions applicable to each type of **trackless mobile machine**, which provisions must at least include:

- 8.11.1 Safety devices to negate unexpected incapacitation of the operator or fatigue management procedures;
- 8.11.2 Vibration control;
- 8.11.3 Protection against noise to which the operator is exposed; and
- 8.11.4 Procedures to prevent persons from being injured as a result of:
 - a) Pedestrians required to interact with **trackless mobile machines** during repair work in a work place or in a travelling way or road way.
 - b) Pedestrians required to interact with **trackless mobile machines** during maintenance work in a work place or in a workshop.
 - c) The interaction of the **trackless mobile machines** with each other and with persons during the refueling processes.
 - d) The interaction of the **trackless mobile machines** with each other and with persons during traction battery replacement.
 - e) Other **trackless mobile machines** being parked or operating in close vicinity of haul trucks at loading and / or discharge points.
- 8.11.5 Procedures for the installation, operation and maintenance of proximity detection and collision avoidance systems, where such systems are required;
- 8.11.6 A suitable ergonomic operating environment; and
- 8.11.7 Visual or audible signals, including the codes for the signals, used for communication.

Question 10

1. As a result of what must reasonable practicable measures, in terms of Mine Health and Safety Act regulation 3.2, be taken to ensure that no person suffers from any electrical shock, arc flash or electrocution? (5)
2. Notices need to be displayed at every point of entry into a substation. What are the requirements for the notices? (5)

3.2 The **employer** must take **reasonable practicable** measures to ensure that no person suffers any electrical shock, **arc flash** or electrocution as a result of:

- (a) exposure to electrical current flow;
- (b) a person coming into contact with **live** exposed parts of any **electrical apparatus**;
- (c) exposure to electricity, **arc flash**, all fault currents, overvoltage and surges;
- (d) any **electrical apparatus** failing due to electromagnetic interference from other equipment;
- (e) any **electrical apparatus** being incorrectly designed, installed, operated or maintained; and
- (f) any exposure to blasts, fires or **arc flashes** resulting from electrical faults.

3.6 The **employer** must take **reasonable practicable** measures to ensure that the area in which a **substation** is located is clearly demarcated and that notices are displayed at every point of entry to such an area. These notices shall:

- (a) prohibit access of any unauthorised person from accessing that area;
- (b) set out the procedures to be followed in the event of a fire;
- (c) set out the first aid treatment measures to be given to persons suffering from the effects of electric shock and burns;
- (d) indicate the presence of electricity;
- (e) describe measures to safely remove any person incapacitated as a result of contact with electricity; and
- (f) have available an effective means of communication.