

Minerals Council South Africa



EXAMINATION PAPER

SUBJECT: OCCUPATIONAL HYGIENE CHAMBER OF MINES OF SOUTH AFRICA – CERTIFICATE IN MINE ENVIRONMENTAL CONTROL PAPER 5 - OCCUPATIONAL HYGIENE SUBJECT CODE: COMMEC 5 EXAMINATION DATE: 7 OCTOBER 2025 TIME: 14H00 – 17H00 (3 Hours)	EXAMINER: S Bergh MODERATOR: S Wheeler TOTAL MARKS: 100 PASS MARK: 60%
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NUMBER OF PAGES: 3

SPECIAL REQUIREMENTS:

All candidates are advised to read the below instructions/requirements and adhere to them. Not adhering to them could lead to the loss of marks.

THIS IS **NOT** AN **OPEN BOOK EXAMINATION**. **FORMULA HANDOUTS ARE AVAILABLE**

- Answer all 4 questions **legibly** in English.
- Write your **ID number** on the outside cover of each book used and on any graph paper or other loose sheets handed in.
NB: Your name **must not** appear on any answer book or loose sheets.
- Show all calculations and **check calculations on which the answers are based**.
- Hand-held electronic calculators may be used for calculations.
- Write **legibly** in ink on the **right-hand page** only – **left hand pages will not be marked**.
- Illustrate your answers by means of sketches or diagrams wherever possible.
- Answers must be given to an accuracy which is typical of practical conditions.
NB: Ensure that the correct unit of measure (SI unit) is recorded as marks will be deducted from answers if the incorrect unit is used. (Even if the calculated value is correct).
- In answering the questions, full advantage should be taken of your practical experience as well as data given
- Please note that you are not allowed to contact your examiner or moderator regarding this examination.
- This is **NOT** an open book examination but the approved formula hand out may be used.
- Cell phones and any other electronic devices are **NOT** allowed in the examination room. **Only Calculator**
- You are encouraged to make use of the **CoMCert Tip-off Hotline** whenever you witness or suspect any wrongdoing related to the CoMCert Examinations on landline **0800 118 998** or alternatively you can use email **COMCert@tip-offs.com**. This tip-off hotline and tip-off email is managed anonymously and confidentially through an independent service provider.

QUESTION 1**[Total Marks: 20]****1.1) Define the following:**

1.1.1) Threshold limit value (TLV) (2)

1.1.2) Farsightedness (2)

1.1.3) Raynaud's Syndrome (2)

1.1.4) Time Weighted Average (TWA) (2)

1.1.5) Homogenous Exposure Group (HEG) (2)

1.2) List and describe five (5) of the multiple functions performed by the human skin. (10)

QUESTION 2**[Total Marks: 20]**

2.1) Determine the Sound Energy Level (SWL) in dB for a fan being tested on surface using the in-duct method. The duct being used has a diameter of 760mm. The measuring station records a sound pressure of 3.0kPa. (20)

QUESTION 3**[Total Marks: 20]**

3.1) Define the terms "inhalable", "thoracic" and "respirable" dust. (6)

3.2) State four (4) requirements of an ideal personal sampling pump (4)

3.3) List the components of the gravimetric sampling train used for the membrane filter method of sampling fibres (RTM1 method) (6)

3.4) Reference is often made to "ergonomic hazards", or "ergonomic problems" in the workplace. However, as ergonomics strives for a healthy and safe workplace, the hazards actually result from the *absence* of ergonomic considerations. These conditions are more correctly called "ergonomic risk factors"

List four (4) major ergonomic risk factors. (4)

QUESTION 4**[Total Marks: 10]**

4.1) List four (4) physiological effects of exposure to vibration. (4)

4.2) Name the two ways hazardous chemical substances may be classified. (2)

4.3) Dust control is based on a threefold approach, name and briefly describe each of the approaches. (4)

QUESTION 5**[Total Marks: 30]****5.1) Describe heat disorders under the headings:****5.1.1)** Heat rash / Prickly heat (2)**5.1.2)** Heat cramps (3)**5.1.3)** Heat exhaustion (2)**5.1.4)** Heat stroke (3)**5.1.5)** Symptoms associated with heat stroke (4)**5.2)** A thermal stress survey on a Tailings Dam has yielded the following results:

Wet-bulb temperature = 28°C

Dry-bulb temperature = 37°C

Globe temperature = 41°C

Calculate the WBGT index and comment on the result (4)

5.3) List the potential engineering control measures what could be considered to reduce noise in the following situations: (8)

Source	Nature of the problem	Proposed Control Measures
Coal processing screens	Screening process and machine drive components produce broadband noise at high intensities	(any three)
Pneumatic rock drill	High velocity exhaust creates turbulence and noise in surrounding air; drill steel vibrations and impact between mechanical parts produces additional noise	(any two)
Structure-borne plant noise	Noise from a refrigeration plant or compressor is directly transmitted into structure of the building, and throughout the building by material conveyance pipes	(any three)

5.4) List the factors which influence good illumination (4)**TOTAL (100)**