

Minerals Council South Africa



EXAMINATION PAPER

SUBJECT: CHAMBER OF MINES OF SOUTH AFRICA: INTERMEDIATE CERTIFICATE IN MINE ENVIRONMENTAL CONTROL PAPER 1 SUBJECT CODE: COMIMEC1 EXAMINATION DATE: 12 OCTOBER 2018 TIME: 14:30 – 17:30	Examiner: Mervin van Rooyen Moderator: Inus Labuschagne TOTAL MARKS: [100] PASS MARK: [60%]
NUMBER OF PAGES: 3	
SPECIAL REQUIREMENTS: THIS IS NOT AN OPEN BOOK EXAMINATION. THERE IS NO FORMULA HANDOUT INSTRUCTIONS TO CANDIDATES: 1. Answer all questions <u>legibly</u> in English. 2. Write your <u>ID number</u> on the outside cover of each book used and on any graph paper or other loose sheets handed in. NB: Your name <u>must not</u> appear on any answer book or loose sheets. 3. Show all calculations <u>and check calculations on which the answers are based.</u> 4. Hand-held electronic calculators may be used for calculations. 5. Write <u>legibly</u> in ink on the <u>right hand page</u> only – <u>left hand pages will not be marked.</u> 6. Illustrate your answers by means of sketches or diagrams wherever possible. 7. Answers must be given to an accuracy which is typical of practical conditions. NB Ensure that the correct unit of measure (SI unit) are recorded as marks will be deducted from answers if the incorrect unit is used. (Even if the calculated value is correct). 8. In answering the questions, full advantage should be taken of your practical experience as well as data given. 9. Please note that you are not allowed to contact your examiner or moderator regarding this examination. 10. Cell phones are <u>NOT</u> allowed in the examination room.	

QUESTION 1

- 1.1 For what purpose do we ventilate an underground mine, where people are required to travel and work? (4)
 - 1.2 Draw a typical ventilation circuit for a deep gold mine. (5)
 - 1.3 List the requirements for an ideal Ventilation Door airlock. (5)
 - 1.4 Draw a typical stope layout for a deep gold mine. (6)
- [20]**

QUESTION 2

- 2.1 List the requirements for a Refuge Bay (11)
 - 2.2 List the factors to be considered when selecting a Self-Contained Self Rescuer (SCSR) (6)
 - 2.3 Breathing apparatus may be divided into three main groups (3)
- [20]**

QUESTION 3

- 3.1 List the types of refrigeration systems available and identify the most common (5)
 - 3.2 Name and discuss methods of Mine Cooling (15)
- [20]**

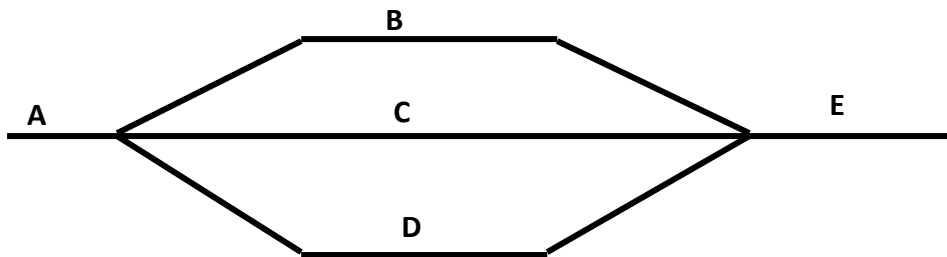
QUESTION 4

4.1 Complete the table below on Frictional Factors

(2)

Airway Type	K-Factor (Ns^2/m^4)
Underground haulage: Rock lined	
	0.0037 (Shaft)
	0.0250 (Shaft)
Raise Bore Hole	

4.2 The sketch below shows diagrammatically the layout of a section of a mine where there is a combination of airways in series and parallel.



Airway	Airway Resistance Ns^2/m^8	Air Flow per Airway m^3/s
A	0.009	90.0
B	0.200	
C	0.180	
D	0.150	
E	0.010	90.0

Determine the following given the information above

- The overall resistance of the section,
- The overall pressure required,
- The volumes in each airway

(18)

[20]

QUESTION 5

- 5.1 Complete the table below listing the advantages and disadvantages when comparing the following types of fans: 10)

	Axial Flow Fans	Centrifugal Fans
Advantage		
Disadvantage		

- 5.2 In order to change the ventilation system, a number of conditions may be altered, name them. (4)
- 5.3 What methods can be used to change a Axial Flow Fan Performance (3)
- 5.4 What method can be used to change a Centrifugal Fan Performance (3)

[20]

TOTAL MARKS: 100