



PROGRAM : NATIONAL DIPLOMA
(MINING ENGINEERING)

SUBJECT : MINING III

CODE : MIN 32-1

DATE : SUMMER SSA EXAMINATION 2014
4 DECEMBER 2014

DURATION : (SESSION 3) 15:00 - 18:00

TOTAL MARKS : 100

WEIGHTING : 60% OF FINAL MARK

EXAMINERS : P WISSEKERKE & T MMOLA

MODERATOR : P BECKER

NUMBER OF PAGES : 3 PAGES excl. COVER PAGE

INSTRUCTIONS

1. ANSWER ALL QUESTIONS
 2. UNDERLINE AFTER EACH QUESTION
 2. COMPLETE SECTIONS A AND B IN DIFFERENT SCRIPTS
 5. NO CELLPHONES (SWITCH-OFF)
 6. DO NOT USE TIPPEX.
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REQUIREMENTS

1. SCIENTIFIC CALCULATOR
 2. MINIMUM TWO SCRIPTS
 3. FORMULA SHEET
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SECTION A
METALLIFEROUS AND GENERIC MINING

QUESTION 1

- 1.1 Sequentially list the stages in exploitation of an orebody by surface methods. (2)
- 1.2 In which ways can surface mining be more advantageous than underground mining? (4)
- 1.3 Describe briefly how access to lower mining levels is achieved in open pit mining. (6)
- 1.4 Describe the basic operating cycle of hydraulic excavators. (4)
- 1.5 Comment on the parallel cut using single and double spotting in terms of shovel and truck productivity. (4)

[20]

QUESTION 2

- 2.1 What is the legal definition of a shaft under South Africa's mining regulations? (5)
- 2.2 What are the steps in shaft sinking? (6)
- 2.3 What is the cycle of operation in shaft sinking? (4)

[15]

QUESTION 3

- 3.1 Name the services that are being provided for when equipping is done in underground mine development. (5)
- 3.2 What are the factors that determine the cut-off depth and size of a decline? (5)
- 3.3 What are the reasons for development in underground mining? (5)

[15]

QUESTION 4

- 4.1 Discuss briefly the following mining strategies: (8)
(a) Stope and retreat
(b) Stope and fill
- 4.2 Under what conditions are sublevel open stoping applied? (4)
- 4.3 List four advantages and four disadvantages of cut-and-fill mining (8)
- [20]
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|------------------------|-------------|
| TOTAL SECTION A | [70] |
|------------------------|-------------|
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PLEASE TURN OVER

SECTION B
COAL MINING

QUESTION 1

(10)

With the aid of sketches describe the two pillar extraction methods practiced in SA Collieries

QUESTION 2

(10)

Detail how you would develop and operate a low seam (0,9m) double drum winch and scraper section.

Hint

(Sequence of coal production cycle using the above mentioned equipment.)

QUESTION 3

(10)

One of the primary developments at a colliery has exposed an undetected up-throw reverse fault. Further investigations indicate a 25 meter displacement.

There is an estimated 3 million mineable reserve in-by of this fault

You are put in charge of negotiating this fault and to re-establish a fully mechanised production section on top of this fault.

Detail the plan of action to negotiate this fault to re-establish the primary development.
(Material / travelling way, Surge bin, RAW.)

TOTAL SECTION B**[30]**
