



FACULTY OF ENGINEERING AND ENVIRONMENT
DEPARTMENT OF MINING ENGINEERING
Mineral Resource valuation
EMI 5103
Examination Paper

This examination paper consists of **3** pages

Time Allowed: 3 hours

Total Marks: 100

Examiner's Name: Mr. T Dombo

INSTRUCTIONS

1. **Answer all questions**
2. Each question carries **20** marks
3. Use of calculators is permissible

Additional Requirements

Calculator

MARK ALLOCATION

Question 1 to 5	Total 20 marks
Part Questions	As shown in each part question
Total Attainable	100 marks

QUESTION 1

- (a) What is your role as an engineer in mineral resource valuation projects? (2)
- (b) Describe financial valuation of a mineral resource project. (5)
- (c) Write short notes on:
 - i. preproduction capital
 - ii. working capital
 - iii. replacement capital
 - iv. improvements capital
 - v. operating costs. (6)
- (d) What are the seven steps you would take in decision making in any mining project? (7)

QUESTION 2

- (a) Rock Technology leased 40 hectares of land to a mining company paying an interest of 6% annually per hectare. What is the worth of the land in n years to come assuming the current worth of each hectare is \$ 50 000? (4)
- (b) How long will Rock Technology take to gain a value of \$2 382 000? (4)
- (c) A mining company borrowed \$ 10 000 from CBZ for its exploration project, how long would it take to repay the loan assuming that you are paying \$1000 annually? Interest rate is 5%. (5)
- (d) Define the following terms:
 - i. cashflow
 - ii. net present value
 - iii. discounted cashflow.
 - iv. net cashflow
 - v. bankable feasibility study
 - vi. prefeasibility study (7)

QUESTION 3

- (a) The estimated daily operating cost to start gold mining in Filabusi with a daily production of 3000 tonnes ore and 2000 waste is given below:

Drilling cost per day = $\$1.90T_p^{0.7}$

Blasting cost per day = $\$3.17T_p^{0.7}$

Loading cost per day = $\$2.67T_p^{0.7}$

Haulage cost per day = $\$18.07T_p^{0.7}$

General services per day = $\$6.65T_p^{0.7}$

Other expenses per day including wages and salaries = $\$145T_p^{0.56}$

Operational days per year = 210

10% of gold mined annually will be paid as tax

350 kgs of gold is to be mined annually and its market value to be \$1200 per ounce.

NB: Oz= 33.1g

The company intends to start mining in 2024, what would be the net cashflow in the year ending 2024? (10)

- (b) What are main causes of differences in estimated values to actual ones in any project? (6)
(c) Describe any two risks associated with a mineral project development. (4)

QUESTION 4

- (a) What are the methods or techniques which can be applied as solution under conditions of uncertainties and risks in any mining project? (12)
(b) What are important financial nature considerations in discounted cashflow analysis? (6)
(c) A profit of \$20 was realized annually for 3 years. Assuming that \$50 had been deposited into the bank. What was the rate of return ? (4)

QUESTION 5

What causes fluctuations in any economic activity? (20)

END OF EXAMINATION