



UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA
FIRST SEMESTER EXAMINATIONS, NOV/DEC 2018

COURSE NO: GM/GL/MN/MR/ES 453
COURSE NAME: MINERAL PROJECT EVALUATION
CLASS: GM/GL/MN/MR/ES IV **TIME:** 3 HOURS

Name: _____ Index Number: _____

Answer three (3) questions ONLY

- 1 (a) What is mineral project evaluation and why is it important to know this in your professional life? **(5 marks)**
(b) An Engineering Student Group deposits GH¢10 000 in a bank at 8% per year compounded annually. It withdraws GH¢850 at the end of the first year GH¢750 at the end of the second year and the remaining balance at the end of the third year
 - (i) How much does the group withdraw at the end of the third year? **(5 marks)**
 - (ii) Calculate their net cash flow? **(5 marks)**
 - (iii) How much better off in terms of net cash flow would the group have been if they had not made the withdrawals at the ends of years 1 and 2? **(5 marks)**
- 2 The Takundi mining project in the Ashanti Region of Ghana requires a capital investment of \$12 million and operating cost of \$5 million per year. The project will last for 4 years starting from January 2018. The gross income from the project is estimated to be \$12 million per year. Ecobank has decided to fund the project with 50% leverage at an interest rate of 10% per annum. By employing the fiscal provisions in the minerals and mining laws of Ghana :
Make a cash flow analysis of the project **(10 marks)**
 - (i) What return should the directors of the mining company expect on their investment? **(5 marks)**
 - (ii) Will you advise the Board to invest in this venture if it expects a MROR of 20%? **(3 marks)**
 - (iii) What is the difference between minimum rate of return and internal rate of return? **(2 marks)**
- 3 (a) What is an evaluation criterion? Define two (2) of such criteria which are commonly

used in the mining industry. Discuss the characteristics which make them suitable as evaluation criteria? (5 marks)

(b) Alonzo Mining Company (AMC) has acquired a gold deposit and wants to evaluate its economic viability. The project requires an initial capital of \$30 million and additional capital of \$15 million at the end of the second year. Throughout its life of 10 years it will generate an income of \$15 million per year. If the minimum rate of return is 10% for the first 5 years and 12% for the remaining 5 years of the project's life use NPV analysis to determine the economic viability of the project. (15 marks)

4 (a) Explain the following interest rate scenarios:

(iv) Simple;

(v) Compound;

(vi) Effective; and

(vii) Continuous interest rates (8 marks)

(b) Table 1 shows cash flow figures for Aziz mining company. Compute the PBP of the project. Comment on your answer. (12 marks)

Table 1 Cash flow of Aziz Mining Company

Year	0	1	2	3	4	5
Cashflow (x \$1000)	-100	20	24	30	36	40

5 (a) What makes mine investment climate unique and different from other business ventures? (4 marks)

(a) Enumerate the various forms of funding mineral projects and explain the cost associated with capital. (4 marks)

(b) Table 2 shows the results obtained from sensitivity analysis using revenue and operating cost as investment parameters for a gold mining project with a minimum rate of return of 20%.

Table 2 Results of Sensitivity Analysis

	Revenue		Operating Cost	
	NPV	IRR	NPV	IRR
- 60	-51 898 315	12%	137 803 651	38%
- 40	19 570 526	23%	130 747 638	35%
- 20	91 039 368	33%	120 691 625	30%
0	134 635 611	37%	110 635 611	25%
20	233 977 051	51%	100 579 598	20%
40	305 445 892	59%	90 523 585	17%
60	376 914 734	68%	90 467 571	10%

(viii) Determine the magnitude of the change in the economic parameters that the project can absorb and still be economically attractive to the investor.

(8marks)

(ix) Give two professional ways to improve the economic performance of the project

(2 marks)

(x) Why were both NPV and IRR used as the decision making criteria? (2 marks)

Richard Gyebuni

Prof Daniel Mireku-Gyimah