UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA

FIRST SEMESTER EXAMINATIONS, NOV/DEC 2018

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

Name**:** _____Index Number: _____

INSTRUCTIONS: Answer any FOUR (4) questions only

Question 1

a. Define depreciation and depreciation allowance **(5 marks)**

b. A mining company purchased a front-end loader in the first year of its operation for $150 000. The estimated life of the bulldozer is 5 years. This front-end loader can be sold for $10 000 at the end of its useful life. It is expected that $3000 will be spent to revamp it at the end of its useful life.

i. Determine the straight-line and double-declining balance depreciation schedules for this front-end loader?

ii. What is the capital loss after the sale of the machine?

iii. Determine the double-declining balance depreciation schedules for this machine when the salvage value is $23,000? **(20 marks)**

Question 2

a. Discuss the distinctive features of the Mine Investment Climate **(5 marks)**

b. An investor is to make the following payments for a mineral concession: $10 000 down payment at time zero; a gradient series of payments starting at $2 000 at the end of year 1 and increasing by a constant gradient of $500 per year up to the end of year 10; and a lump sum, "balloon" payment of $ 20 000 at the end of year 10. With an interest rate of 10% compounded annually, calculate the following:

i. The present worth of payment, i.e., the single time zero payment that would be equivalent to the given series of payments.

ii. The future worth of payments, i.e., the single end of year 10 payment that would be equivalent to the given series of payments.

iii. The equivalent annual payments, i.e., the uniform annual payments at the end of each year that would be equivalent to the given series of payments.

(20 marks)

Question 3

(a) Define the following sources of financing mineral projects:

(i) Long-term debt

(ii) Common stock

(iii) Preferred stock

(iv) Shareholder fund

(8 marks)

b. How much money will accumulate in a savings account in 10 years time if GH¢ 500 is deposited quarterly in this account and the bank pays interest at the rate of 12% compounded:

(i) Monthly

(ii) Quarterly

(iii) Annually.

(17 marks)

Question 4

a. Define the following terms

(i) Interest

(ii) Interest rate

(iii) Minimum rate of return

(iv) Minimum discount rate

(v) Compound interest

(5 marks)

b. Gold Star Limited is to finance its mineral project at Bogoso from the following sources: Long-term debt of GH¢ 50 000 000 to be accrued from selling debentures with a yield to maturity of 9%, the current marginal tax rate being 45%; Common stock of GH¢ 75 000 000 with assumed current dividend of GH¢ 40 per share at a stock price of GH¢ 500 per share and an annual growth rate of 2%; and Preferred stock of GH¢ 25 000 000 to be obtained from an Investment Bank which intends to issue a straight preferred stock on the market which pays annual dividend of GH¢ 300 with a current stock price of GH¢ 500 per share.

(i) Calculate the Marginal Weighted Average Cost (MWAC) of the total capital.

(ii) What is the significance of the MWAC in the economic evaluation of the mineral projects?

(20 marks)

Question 5

(a) Explain concisely the essence of the following analyses in evaluating the economic performance of a mineral project:

(i) Risk analysis; and

(ii) Sensitivity analysis.

(5 marks)

(b) Table Q4 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 Q4 Results of Sensitivity Analysis

% Change	Revenue		Operating Cost	
	NPV ($)	**IRR (%)**	**NPV ($)**	**IRR (%)**
-40	-400 000	-20	1 040 000	124
0	400 000	60	400 000	60
40	1 200 000	140	-240 000	-4

(i) Why were both NPV and IRR used as the decision-making criteria?

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

(iii) Give two (2) professional ways to improve the economic performance of the project.

(20 marks)

Question 6

A mining company is determined to mine an alluvial deposit at Nkroful in the Western Region of Ghana. Feasibility studies show that the project will require a capital of $60 million and operating cost of $15 million per year. The project will last for 5 years, at the end of which it can be sold for $6 million. The gross income from the project is estimated to be $36 million per year. The Directors of the company have decided to finance the project with 50% equity and their capital can be recovered by straight line depreciation. If the income tax is 35% discount rate and interest rate are 10% each, and the royalty rate is 5%, do the following:

(i) Make a cash flow analysis of the project

(ii) Determine the discounted payback period

(iii) What return should the directors of the mining company expect on their investment?

(iv) Is this a good buy for an investor who expects 20% return on his investment?

(25 marks)

EXAMINERS: OPAFUNSO/GYEBUNI