

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF ARCHITECTURE AND QUANTITY SURVEYING
BACHELOR OF QUANTITY SURVEYING (HONOURS) DEGREE
PART II FIRST SEMESTER EXAMINATIONS – DECEMBER 2005**

CONSTRUCTION ECONOMICS – AQS 2108

TIME: 3 Hours

TOTAL MARKS: 100

INSTRUCTIONS:

Answer Question **1** and any **3** others.
Show all workings.

QUESTION 1

Two projects have the following expected Cash Flows.

Yr.	Project A	Project B
0	375 000	375 000
1	135 000	75 000
2	135 000	112 500
3	135 000	150 000
4	135 000	225 000
5	135 000	300 000
6	135 000	375 000

The discount rate is 70%

- a) Compute NPVs of the two projects. (5 marks)
- b) What are the IRRs for the two projects? (5 marks)
- c) Use the Infinity approach and the Uniform annual series approach to decide which machine the firms should purchase. (15 marks)

QUESTION 2

- a) ABC bank advertises that investors can become millionaires in 10 years, given a rate of interest of 18% compounded annually. What is the annual investment that an investor should make to reach the objective of becoming a millionaire? (5 marks)
- b) If you invest \$2000 today for a period of 10 years at an interest rate of 30%, what is the future value when using continuous compound? (5 marks)

c) Suppose that you have shopped around and come with the following rates:

Bank A pays interest rate of 18% compounded annually

Bank B pays interest rate of 17.5% compound quarterly

Bank C pays interest rate of 17% compounded monthly

Bank D pays interest of 16 compounded daily

Which one of these rates is the best if you think of opening an account? Why?

(10 marks)

QUESTION 3

Elephant Hills Hotel expects to have a \$10 million credit sales this year. Its variable cost as a percentage of sales are 80% and its cost of capital is 16%. Currently the hotel's credit policy is 'net 25'. However its average collection period is 30 days and 2% of sales are written off as bad debts. The hotel spends \$50 000 a year to collect money from debtors.

You are the credit manager and you are considering the following two proposals to change the credit policy:

Proposal 1:

Change the credit period from 'net 25' to 'net 20'. Collection expenses will remain at \$50000 but the following changes are expected to occur:

- (i) Sales will decrease by \$1 million per year
- (ii) The average collection period will decrease from 30 to 22 days
- (iii) Bad debts losses will decline to 1% of sales.

Proposal 2:

Change the credit period from 'net 25' to 'net 30'. Under this proposal, the debts collection expenses will remain constant. Sales are expected to increase by \$1 million annually and the bad debt loss percentage on new sales will be 4% while loss percentage on old sales will remain at 2%. The average collection period is expected to increase from 30 to 45 days on all sales.

Required:

Decide whether the change in credit policy should be implemented and state with reasons the alternative to be followed.

(25 marks)

QUESTION 4

A company is considering a two-year project with an initial capital outlay of \$350 000. The expected cash flow from the project will depend on whether interest rates will fall in the first year or the second year of the project. There is a 60% chance that interest rates will fall in the first year. If this is the case, then the net cash flow will be \$250 000. However, if the interest rates do not fall in the first year, the net cash will be reduced to

\$120 000.

The cash flow in the second year will also depend on the interest rates in the first year or the second year. If interest rates fall in the first year then there is a 30% chance that the cash flow in the second year will be \$300 000 and a 70% chance that the cash flow will be \$200 000. However, if interest rates do not fall in the first year but only in the second year of operation, then there is a 60% chance that the cash flow in that year will be \$400000 and 40% chance that will be \$450 000.

Required

- a) Analyze this decision. The required rate of return is 22% (15 marks)
- b) A project has an initial investment of \$20 000 and annual cash flow of \$15 000 and \$20 000 in year 1 and 2 respectively. The inflation rate is expected to be 20%pa in both years. If the real discount rate is 10% calculate the NPV of the project.

(10 points)

QUESTION 5

- a) In 2002, Isabel had earnings per share of \$4.50 and paid dividends per share of \$2.00. Analysts expected both to grow at 9.91% for the next 5 years. After the fifth year, the growth rate was expected to drop to 6% a year forever, while payout ratio was expected to increase to 67.44%. The required return on Isabel is 12.78%. Calculate the value of the stock.

(15 marks)

- b) What are the factors to be considered when a company is considering a merger? (10 points)

END OF EXAMINATION