MURANG'A UNIVERSITY COLLEGE (MRUC)

(*A Constituent College of Jomo Kenyatta University of Agriculture & Technology)*

MURANG'A UNIVERSITY COLLEGE DEPARTMENT OF COMMERCE

COURSE CODE: DIB1111 COURSE TITLE: QUANTITATIVE TECHNIQUES

EXAM TIME: 2HOURS, ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS IN SECTION B.

SECTION A

Question 1

Superior Products Ltd. is considering a project to purchase additional equipment for its miniature battery manufacturing plant. The equipment will cost €52,000. The Company Accountant estimates the following cashflows:

Year	1	2	3	4
Cash Flows €	21,000	26,000	18,000	1,000

At the end of year 4 the equipment will have a disposal value of €5,000. The company uses a cost of capital of16% for investment proposals.

(i) Calculate the Net Present Value (NPV) and the Internal Rate of Return (IRR) on the project. (8 Marks)

The company also wishes to determine the best method of financing the project.
The following options are available

- Bank Loan of €52,000 repayable at the end of year 4 with interest of 14% payable each year.
- Lease the equipment for 4 years at a rental of €16,000 per year, payable at the end of each year.
- Hire-purchase with an initial payment of €14,000 and 4 annual payments of €14,000.

(ii) Advise the company on the best method of financing the project. (12 Marks)

[Total: 30Marks]

SECTION B.

2. As the Investment Advisor of CPA Consultants, you are asked to deal with the following problems presented byclients.

(i) DIB Ltd. estimates that it will have to purchase a new plant in two years from now at a cost of €450,000.

(ii) It has been quoted a nominal interest rate by New World Banking of 12%, compounded at three monthly intervals. Advise the company on

- The sum that it should now set aside to purchase the equipment (4 Marks)

- The APR (annual percentage rate) of such a loan. (4 Marks)

(ii) DIB Ltd. is considering whether to use straight line or reducing balance methods of depreciation. It purchases an asset for €450,000 , expected to last 5 years and to have a scrap value of €50,000. Outline the annual depreciation that would be expected with straight line depreciation and the value of the asset after 5 years with the reducing balance method (assuming a depreciation rate of 20%). (6 Marks)

(iii) Superior Products Ltd. has estimated its fixed costs of production at €2,100 per week and its variable costs at €11 per unit. You are asked to derive the demand function linking costs and quantity demanded. Hence estimate the total costs at a production level of 12,000 per week. (6 Marks)

[Total: 20 Marks]]

3. Each of two cabinets identical in appearance has two drawers. Cabinet A contains a silver coin in each drawer; cabinet B contains a silver coin in one of its drawers and a gold coin in the other. A cabinet is randomly selected, one of its drawers is opened, and a silver coin is found. What is the probability that there is a silver coin in the other drawer? [total: 20 marks]

question 4)

i). $Z = 30x_1+40x_2+20x_3$

subject to constraints

$100x_1+120x_2+70x_3=1,00,000$

$7x_1+10x_2+8x_3=8000$

$x_1+x_2+x_3=1000$

,

x_1, x_2, x_3

≥ 0