STRATHMORE BUSINESS SCHOOL

MASTER OF SCINCE IN DEVELOPMENT FINANCE

END OF SEMESTER EXAMINATION

MDF 8105: FINANCIAL RISK MANAGEMENT

Date: Monday 8th April 2024 **Time: 3** Hours

Instructions

1. This examination consists of **FIVE** questions.
2. Answer Question **ONE** and **ANY OTHER TWO** Questions

Question 1 (Compulsory) (30 Marks)

Murtagh Ltd, a family-run company, produces and sells tractors and farming equipment. It is considering introducing a new product that mechanically splits open animal feeds. The proposed selling price is Shs. 20 000 per unit. The local farmers' co-op has carried out some market research and has produced the following estimates for 2024.

	January	February	March	April	Total
Sales (units)	25	20	20	25	90
Production (units)	40	20	25	24	109

20% of sales are for cash and receive a 2% discount. The balance of sales is on credit and are received in the month following sale. The standard production cost and payment terms per month have been estimated as follows:

	Quantity per unit	Cost per unit	Unit price	Payment terms
Material	300kg	Shs.3 per kg	Shs.900	Paid the month following purchase
Labour	1000 hours	Shs.15 per hour	Shs.15,000	Paid in the month incurred
Variable overheads	1000 hours	Shs.3 per hour	Shs.3,000	50% paid in the month incurred and balance in the next month

Fixed overheads are Shs.20 000 per month. They are made up of:

(i) A rental charge of Shs.10 000 per month which is paid in the current month.

(ii) A light and heat charge of Shs.1 000 per month which is paid one month in arrears.

(iii) A sundries charge of Shs.9 000 per month. This includes insurance and indirect labour. It is paid one month in arrears.

New equipment costing Shs.20 000 will be purchased in January and paid for in two equal instalments in February and April.

There will be no closing inventory of raw materials or work in progress. The exact number of raw materials required for each month's production will be purchased at the beginning of each month. Production and closing inventory of finished goods will be valued at the standard production cost, i.e., materials, labour and variable overheads. The company has an opening cash balance of Shs.700 000 in its bank account.

Required:

i. Prepare a cash budget for the four months ending April 2024. Include a total column. **(14 marks)**

ii. Comment on the firm's liquidity risk for the four months pointing out the critical months and what action the company can take to address the same **(6 Marks)**

iii. From the dataset in (i) above, Murtagh Ltd is likely to face credit risk as 80% of sales are on credit and customers are expected to pay their credit one month in arrears. Discuss the use of 5Cs of credit that Murtagh can use in screening customers before advancement of credit (1**0 Marks)**

Question 2 (20 marks)

An Irish multinational corporation has a strong export trade to the US and is considering the development of a subsidiary there. All relevant information follows:

1. The initial investment is $40 million and the existing spot rate of €1 = $1.05. In addition, $20 million is needed for working capital at the start of the project and this will be recovered at the end of the project.

2. The price, demand and variable cost are as follows:

Year	Price	Demand	Variable costs
1	\$500	40,000	\$30
2	\$511	50,000	\$35
3	\$530	60,000	\$40

3. The fixed costs are estimated to be \$6 million per year.
4. The exchange rate of the dollar is expected to be \$1.07 at the end of year 1, \$1.09 at the end of year 2 and \$1.11 at the end of year 3.
5. The American government will impose corporation tax of 30% on income. The Irish government will allow a tax credit on remitted earnings and will not impose any additional taxes.
7. All cash flows received by the subsidiary are to be sent to the parent at the end of each year.
8. The plant and machinery are depreciated over eight years using the straight-line method i.e. \$5 million per year.
9. At the end of three years the subsidiary is to be sold and the parent company expects to receive \$60 million (including working capital) net of all taxes.

Required:

i. If the company requires a 20% rate of return, determine whether the project is viable using the net present value (NPV) technique. **(10 marks)**

ii. The table below shows the average return on three unit-linked funds over a thirty-five-year period together with the standard deviation of returns.

Fund	A	B	C
Average Return (%)	7	10	12
Standard Deviation (%)	2	4	7

Which of the funds would be chosen by an investor adopting:

a) Roy's criterion (lower acceptable return, R_l = 3%) **(2 marks)**
b) Kataoka's criterion (acceptable risk level, α = 15%) **(4 marks)**
c) Telser's criterion (lower acceptable return, R_l = 3%, and acceptable risk level α = 15%)? **(4 marks)**

Question 3 (20 marks)

i. What is Value at Risk model to risk measurement? **(1 mark)**

ii. Discuss three approaches used for measuring Value at Risk in a firm. **(3 marks)**

ii. Bulder Plc, an investment firm, has Shs 100,000 which consists of Shs 60,000 worth of stock x and Shs 40,000 worth of stock y. Given that σx is 0.016284, and σy is 0.015380 and the correlation coefficient between the two assets is -0.19055.

Required:

Compute the VaR using the variance-covariance approach if the 95% confidence level is expected over:

i. A day **(4 marks)**

ii. month (22 trading days). **(6 marks)**

iii. a year (252 trading days). **(6 marks)**

Question 4 (20 marks)

i. Discuss **FIVE** techniques that are applicable to exchange rate and interest rate risk management. **(10 marks)**

ii. Three possible investments have been identified by B and H plc. The company wants to invest an equal sum in two of these investments and the following information is available:

	M	N	O
Expected return	15%	18%	17%
Standard deviation	2.4%	6.2%	4.3%

Covariance of returns:

M&N	12.2%
M&O	8.1%
N & O	-4.5%

a) Estimate the correlation coefficient between each of the three possible portfolio combinations and explain the implications of these coefficients to portfolio managers **(6 marks)**

b) Which of these three possible combinations would you consider to be riskier? **(4 marks)**

Question 5 (20 marks)

XYZ Corporation is a medium-sized company that operates in the financial services industry. The company has recently experienced a significant increase in fraudulent activities, which has resulted in financial losses. The management team has decided to implement a fraud risk management framework to mitigate the risk of fraud.

Required:

i. Discuss **FIVE** key components of a fraud risk management framework**.** **(10 marks)**

ii. One of the Tullow Oil's foreign competitors surprised the market by becoming insolvent because of paying too much to acquire a competitor when selling price of their barrel of Oil dipped as the world economy went into near recession at the onset of COVID-19. As a result, the Chief executive officer (CEO) wanted to know if this was likely to happen to Tullow Oil Corporation. She had read about the Altman Z-score as a way of predicting corporate failure and had a business analysist prepare a report calculating the Z-score for Tullow Oil Corporation (Based on the Z-score model as originally developed in 1960s).

The Altman Z-score model is Z- Score = $1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$

Where: X_1 = Working capital/Total assets

X_2 = Retained earnings/Total assets

X_3 = Earnings before interest and tax/Total assets

X_4 = Market value of Equity/Liabilities

X_5 = Sales/Total assets

Using the most recent figures from Tullow Oil Corporation's financial statements (Year ending September 2023), Tullow Oil Corporation 's Altman Z-score is 3.5. In this model, a Z-score of more than 3 is considered safe and at below 1.8, the company is at risk of failure in the next two years.

Required:

i. Evaluate the result of the analyst's calculations and appropriateness of the Altman Z-score for Tullow Oil Corporation. **(6 marks)**

ii. Discuss briefly the role of the following in risk management:

(a) The board of directors **(2 Marks)**

(b) The chief risk officer **(2 Marks)**