CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS
EMBU CAMPUS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF COMMERCE

BCOM 433: FINANCIAL MODELING AND FORECASTING

STREAMS: BCOM Y4S1   **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 07/07/2021   **11.30 A.M. – 1.30 P.M.**

INSTRUCTIONS:

- **Answer question one and any other two questions**

QUESTION ONE (30 MARKS)

(a) Outline clearly the areas of application of financial models.   (6 marks)

(b) Explain the following types of financial models.   (2 marks)

    (i) "What if" Models   (2 marks)

    (ii) Optimization models   (2 marks)

(c) There is a general belief by asset pricing researchers that returns on a stock can be predicted by the level of a firm's book-to-market ratio. A financial analyst has gathered the following historical data on stock returns (%) and book-to-market ratio for ABC Ltd. stock over a span of 12 years.

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Returns %	15	20	19	16	25	20	20	23	14	22	18	18
B/M	0.9	1.9	1.1	1.4	2.3	1.2	1.2	2.2	0.7	1.3	1.5	1.7

Required:

    (i) Fit the regression equation on the data using least squares method.   (6 marks)

    (ii) Hence project the return on the share if the market-to-book ratio is 0.4   (2 marks)

    (d) Liberty Kenya holdings Ltd. wishes to prepare a four-month project of cash collection using a lagged model structure:

    $C.C = a * sales + b * sales(-1) + sales(-2)$

    Where: CC = cash collection from customers

    The firm will maintain the following credit collection policy

        (i) 60% percent is received in the month of sale

        (ii) 20% in the month following the sale

        (iii)   The balance in the second month following the sale.

The table below shows estimated sales for the first five months of the year 2021

Month	Estimated Credit Sales Ksh.	
1	120,000	
2	100,000	
3	140,000	
4	150,000	
5	160,000	

    If 5% of the cash collection expected in the second month following the sale is deemed doubtful, prepare a schedule showing expected cash collection for the first four months of the year 2021. Assume that credit sales in the last month of the year 2019 were Ksh.80,000.

QUESTION TWO (20 MARKS)

    (a) Outline the basic principles underlying forecasting.   (6 marks)

    (b) The table below displays data on annual sales in (000 units) for product Q produced by XYZ Ltd.

Year (t)	1	2	3	4	5	6	7	8	9	10
Actual Sales (Yt)	60	64	58	66	70	60	70	74	62	74

Suppose you wish to apply simple exponential smoothing model to predict future sales using a = 0.1 as the exponential constant. By applying the first three year average to initialize the data;

    (i) Obtain the predicted sales for period 4 up to 10   (4 marks)

(ii) Calculate the Mean Squared Error (MSE) for the model   (2 marks)

(iii)   Comment on the effectiveness of your forecast model using Theil-U statistic. (4 marks)

QUESTION THREE (20 MARKS)

(i) The following relates to quarterly demand for Ndimu product over a three year period.

Year	Q1	Q2	Q3	Q4
2018	5.8	5.1	7.0	7.5
2019	6.8	6.2	7.8	8.4
2020	7.0	6.6	8.5	8.8

Required:

(i) Calculate the trend in the data using centred four quarterly moving average (6 marks)

(ii) Explain the secular trend component of time series data   (4 marks)

(ii) Consider the following items extracted from financial statements of Kotecha Ltd for the year ended 31st December 2020.

	Ksh '000'
Sales	20,000
Current Assets	6,000
Non-current Assets	24,000
Current Liabilities	10,000
Long-term Debt	6,000
Shareholders' equity	14,000

This company wishes to establish external funding needed to support 10% annual growth in sales for the next 2 years.

The following assumptions are to be taken into consideration;

(i) All balance sheet items are expected to increase spontaneously with the sale except shareholders' equity.

(ii) The company will maintain 50% pay-out rate for the foreseeable future.

(iii)   Profit margin will be maintained at a constant rate of 10%

Apply the percentage sales model to estimate the required external funding for the year ending 31st December 2021 and 2022.

QUESTION FOUR (20 MARKS)

(a) Explain by use of examples, the following variables used in the development of financial models

    (i) Policy variables   (2 marks)

    (ii) External variables   (2 marks)

    (iii)   Performance variable   (2 marks)

(b) The following information and statement of financial statement relates to ABC Ltd for the year ended 31st December 2015.

Sales Revenue ksh. 6.0 Million

Cost of Sales (all variable) = 0.50* Sales Revenue

Selling and administrative expenses: 50% of the Gross profit

Interest cost = 10% of non-current liabilities

Taxes = 0.3* Income before tax

STATEMENT OF FINANCIAL POSITION

As at 31st December 2015

	Ksh. 000
Non Current Assets:	
• Land	1,000
• Property, land & equipment	13,000
Total non-current assets	**14,000**
Current Assets	
Cash	400
Accounts receivables	3,000
Inventory	4,000
Total current assets	**7,400**
Total assets	**21,400**
Financed by:	
Ordinary share capital (500,000)	1,000
Preference share capital (100,000)	1,000
Share premium	2,000
Retained earnings	3,400
Shareholders' equity	**6,400**
Current Liabilities;	

Accounts payables	5,000
Notes payables	1,000
Total current liabilities	**6,000**
Non-current liabilities:	
4-year loan	5,000
Mortgage	4,000
Total Non-current Liabilities	**9,000**
Total liabilities and shareholder's equity	**21,400**

Additional information:

The ordinary shares are currently priced at 120% of their book value.

Require:

   (i) Compute the Altman Z-score model for ABC Ltd and interpret your results. (10 marks)

   (ii) Discuss the likely effects of financial distress to a company.   (4 marks)

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