CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

FOURTH YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF COMMERCE

BCOM 433: FINANCIAL MODELING AND FORECASTING

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

DAY/DATE: FRIDAY 06/12/2019 **2.30 P.M. – 4.30 P.M.**

INSTRUCTIONS:

- **Answer question ONE and any other TWO questions.**

QUESTION ONE (30 MARKS)

(a) Explain what financial modeling is and point out areas where financial models are used. (6 marks)

(b) A financial analyst has gathered the following historical annual returns on stock N for the last 12 year.

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Return %	15	20	14	16	25	20	20	23	14	22	18	18

Required

(i) Fit a trend line on the time series data. (4 marks)

(ii) Hence project the return on the share for the year 2030. (2 marks)

(c) Highlight the steps involved in financial forecasting. (6 marks)

(d) Liberty Kenya Holdings Ltd. wishes to prepare a three-year projection of net income using the following model structure.

2016 base year amounts are as follows:
Sales revenue Ksh. 60,000
Cost of sales (all variable) = 0.42* sales revenue
Operating expenses: 10,000 + 0.05*sales revenue
Taxes = 0.3* Net income

Use the following assumptions:

Sales revenues will increase by 6% in 2017, 7% in 2018 and 8% in 2019.
Cost of sales increases by 5% each year
Operating expenses will increase by 10% in 2017 but will remain at the 2017 level thereafter.

Required:
The projected income statement for the next three years. (12 marks)

QUESTION TWO (20 MARKS)

(a) Describe the characteristics that distinguish qualitative and quantitative forecasting techniques. (6 marks)

(b) The following is data on cash flow from an investment project for XYZ Ltd.

Year (t)	Actual cash flows (Y_t) in Ksh. 000)
2011	30.0
2012	31.5
2013	29.0
2014	34.5
2015	32.0
2016	36.0
2017	37.5

Suppose you wish to apply exponential smoothing model to predict future cash flows using $\alpha = 0.5$ as the exponential constant.

Required:

(i) Using three period average as the initial forecast, obtain the following predicted cash flows Y'_{2014}, Y'_{2015}, Y'_{2016}, $and\ Y'_{2017}$ (6 marks)

(ii) Calculate the Mean Squared Error (MSE) for the model. (4 marks)

(iii) In order to adjust predictions to large fluctuations in the data, you wish to try a lower value of exponential constant, $\alpha = 0.4$. Which of the two constants would you recommend and why? (4 marks)

QUESTION THREE (20 MARKS)

(a) The following information relates to quarterly profit (Sh. Million) earned by firms in Growth Enterprise Market Segment of the NSE.

Year	Q1	Q2	Q3	Q4
2009	5.8	5.1	7.0	7.5
2010	6.8	6.2	7.8	8.4
2011	7.0	6.6	8.5	8.8

Required:

(i) Centred four quarterly moving average. (4 marks)

(ii) Average seasonal index for each quarter using multiplicative model. (6 marks)

(iii) Suppose the trend equation based on deseasonalized data is $\hat{y} = 5.982 + 0.1731t$, Obtain the forecast earnings for the 3rd quarter of 2012. (4 marks)

(b) Consider the following items extracted from the financial statements of Kotecha Ltd for the year ended 31st December 2017.

	Ksh. '000'
Sales	20,000
Current assets	1,200
Non-current assets	1,800
Current Liabilities	400
Long-term Debt	800
Shareholders' Equity	1,800

The company wishes to establish external funding needed to support 10% growth in sales The following assumptions are to be taken into consideration:

(i) All balance sheet items are expected to increase spontaneously with sales except shareholders' equity and long term debt.

(ii) The company will maintain 50% payout rate for the foreseeable future.

(iii) Profit margin will be maintained at a constant rate of 13.2%

Apply the percentage of sales model to estimate the required funding. (6 marks)

QUESTION FOUR (20 MARKS)

(a) Explain the following qualitative decision models highlighting strength and weakness for each

(i) Delphi method (2 marks)

(ii) Jury executive opinion (2 marks)

(b) Discuss the determinants of risk of financial distress in a firm. (4 marks)

(c) The following statement of financial position and income statement relate to Double M ventures that recently listed on the Nairobi Securities Exchange and its shares are currently priced at Sh. 6 per share:

Double M Ventures
Statement of Financial position as at 31 December 2013

Assets:	Sh '000'
Non-Current Assets	14,000
Total Current Assets	7,400
Total Current Liabilities	(6,000)
Total Net Assets	**15,400**
Financed by:	
Ordinary Share Capital (500,000 shares)	1,000
Preference shares capital (100,000 shares)	1,000
Share premium	2,000
Retained earnings	1,400
Total Shareholders' Equity	5,400
Non-Current Liabilities	10,000
Total Long term liabilities and equity	**15,400**

Double M Ventures
Statement of Comprehensive Income
For the year ended 31 December 2013

	Sh '000'
Sales	6,000
Cost of goods sold	(3,500)
Selling and administrative expenses	(1,000)
Earnings before interest and taxes	1,500
Interest	(1,100)
Earnings before taxes	400
Taxes (30%)	(120)
Net income	280

Required: Compute the Altman Z-score for the company and interpret the result obtained. (12 marks)
