TECHNICAL UNIVERSITY OF MOMBASA

UNIVERSITY EXAMINATION FOR:

BACHELOR OF COMMERCE (FOURTH YEAR)

BMS 4304: FINANCIAL FORECASTING AND MODELLING

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: 2016

Instructions to Candidates
You should have the following for this examination
-Answer Booklet, examination pass and student ID
This paper consists of FIVE questions. Question One is Compulsory. Answer any other two questions.
Do not write on the question paper.

Question ONE (Compulsory)

MIT Ltd is a manufacturer of electrical products, with advanced information technology features. MIT Ltd's results have stagnated over recent years with static sales and falling operating profit margins. Recent developments in information technology have however allowed MIT Ltd to develop new lines, which the directors of the company would like to launch on markets as soon as possible, although competition is strong. The company needs to invest in new manufacturing technology if it is to launch these products. If the products are successful, MIT Ltd is in the process of developing further new lines of products, although these are likely to be in even tougher markets.

MIT Ltd is listed on Nairobi Stock Exchange (NSE) and has traditionally had a mixture of debt and equity finance. Its abbreviated income statement and balance sheet for the year ended 30 April 20X5 are set out below.

APPREVIATED INCOME STATEMENT FOR THE YEAR ENDED 30 APRIL 20X5

	Shs'000
Sales	42,000
Operating profit for the year	5,500
Interest payable	1,000
Net profit before taxation	4,500
Taxation at 28%	1,260
Net profit after taxation	3,240
Dividends proposed	1,050
Retained profit for the year	2,190

APPREVIATED BALANCE SHEET AS AT 30 APRIL 20X5

	Shs'000
ASSETS	
Non-current assets at written values	22,500
Current assets	11,500
	34,000
EQUITY AND LIABILITIES	
Capital and reserves	
Ordinary share capital of Sh.1.00 each share	4,000
Accumulated profits	10,500
	14,500
Non-current liabilities	
8% redeemable loan stock	12,500
Current liabilities	7,000
	34,000

The directors expect the new products to generate additional sales of sh.15 million in the year ended 30 April 20X6, and that the operating profit margin on these products will average 8%. The board predicts that sales and operating profit margins will improve in subsequent years, as the new products become established. To generate these sales, the directors estimate that sh.9 million will need to be invested. The directors intend to raise these funds, either:

- By a rights issue of Sh.1.00 ordinary shares at a premium of shs.2.00 per share.
- By an issue of 10% loan stock at par.

Even if the rights issue is chosen, MIT Ltd's board would prefer to maintain a constant dividend payout ratio.

Current loan stock holders have indicated to the directors that they are unhappy with MIT Ltd taking on more debt, as they believe shareholders will benefit at their expense. Certain major shareholders have also expressed concern that although dividends are linked with the results MIT Ltd achieves, there appears to be no link between directors' remuneration and results.

Required:
(a) For each of the financing options mentioned above:
  (i) Prepare a forecast income statement for the coming year. (8 marks)
  (ii) Calculate the forecast earnings per share for the coming year. (6 marks)
  (iii) Calculate the projected level of gearing at the end of the coming year. (6 marks)

(b) Discuss why the interest of loan stock holders may conflict with those of shareholders and instances where their interaction may not conflict and explain how loan stockholders can affect how a company achieves its key financial objectives.
(10 marks)
(Total = 30 marks)

Question TWO

You are assisting the management accountant with sales forecasts of two brands – Y and Z for the next three quarters of 20X6. Brand Y has a steady, increasing trend in sales of 2% a quarter and Brand Z a steadily falling trend in sales of 3% a quarter. Both brands are subject to the same seasonal variations, as follows:

Quarter	Q_1	Q_2	Q_3	Q_4
Seasonality	-30%	0	-30%	+60%

The last four quarter's unit sales are shown below:

	20x5 Q_2	**20X5 Q_3**	**20X5 Q_4**	**20X6 Q_1**
Brand Y	331	237	552	246
Brand Z	873	593	1,314	558

Required:
(a) Seasonally adjust the sales figures for 20X6 Q_1, giving your answer to one decimal place.
(4 marks)
(b) Forecast the trend for brand Y for 20X6 Q_4, giving your answer to one decimal place.
(4 marks)
(c) If the trend forecast for part (b) above was 370, forecast the actual sales of brand Y for 20X6 Q_4, giving your answer to the nearest whole number. (4 marks)

(d) Forecast the trend for brand Z for 20X6 Q_3, giving your answer to one decimal place.
(4 marks)
(e) If the trend forecast in part (d) above was 770, forecast the actual sales of brand Z for 20X6 Q_3, giving your answer to the nearest whole number. (4 marks)
(Total = 20 marks)

Question THREE

A company is building a model in order to forecast total costs based on the level of output. The following data is available for last year:

Month	Output '000 units	Costs Sh'000
January	16	170
February	20	240
March	23	260
April	25	300
May	25	280
June	19	230
July	16	200
August	12	160
September	19	240
October	25	290
November	28	350
December	12	200

Required:

(a) Calculate the correlation coefficient between output and costs, giving your answer to the nearest three decimal places. (8 marks)

(b) Use the least squares regression method to derive a forecasting model. (10 marks)

(c) What is your estimate for costs if the company produced 330 units? (2 marks)

(Total = 20 marks)

Question FOUR

Quarterly demand for Mercedez Benz 350 at a Nairobi auto dealer is forecasting with the equation:
$$\hat{Y} = 10 + 3X$$

where

X = quarters: quarter I of last year = 0
Quarter II of last year = 1,
Quarter III of last year = 2,
Quarter IV of last year = 3,
Quarter I of this year = 4,
and so on,

and

$\hat{Y}$ = quarterly demand.

The demand for Sport Sedans is seasonal and the indices for quarters I, II, III, and IV are 0.80, 1.00, 1.30, and 0.90, respectively.

Required:

(a)   Forecast demand for each quarter of next year, and   (10 marks)

(b)   Then seasonalize each forecast to adjust for quarterly variations.   (10 marks)
(Total = 20 marks)

Question FIVE

(a)   Briefly describe the steps that are used to develop a forecasting system.   (2 marks)

(b)   What is a time series forecasting model? When is it appropriate?   (2 marks)

(c)   What is a qualitative forecasting model, and when is it appropriate?   (2 marks)

(d)   Set out a brief overview of four different qualitative forecasting techniques.   (2 marks)

(e)   What is a major drawback of the moving average forecasting model?   (2 marks)

(f)   What effect does the value of the smoothing constant have on the weight given to
        the past forecast and the past observed value?   (2 marks)

(g)   What are the major forecasting problems?   (2 marks)

(h)   Enumerate and explain briefly a number of changes that may make it difficult to forecast future

        events in a business.   (2 marks)

(i)   Explain how spreadsheet packages can be used to build business models to assist the forecasting and
        planning.   (4 marks)
(Total = 20 marks)