

TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF BUSINESS

ACCOUNTING AND FINANCE DEPARTMENT

**COURSE/CLASS: BACHELOR OF COMMERCE
FOURTH YEAR SEMESTER I AND II**

UNIT : BMS 4304

UNIT NAME : FINANCIAL FORECASTING AND MODELLING

SERIES : MAY 2016

TIME : 2 HOURS

INSTRUCTIONS TO CANDIDATES:

Answer Question One (Compulsory) and any other TWO questions.

QUESTION 1 (COMPULSORY)

- (a) A company has the following data for output and costs of production over the past five months for the year 20X1:

| <u>Month</u> | <u>Output</u> <u>(in 000 units)</u> | <u>Costs</u> <u>Sh000</u> |
|--------------|--|------------------------------|
| 1 | 20 | 82 |
| 2 | 16 | 70 |
| 3 | 24 | 90 |
| 4 | 22 | 85 |
| 5 | 18 | 73 |

Required:

- (i) Develop a financial model (equation) to determine the expected cost level for any given output. (5 marks)
- (ii) Forecast total costs if output is 23,000 units. (5 marks)
- (b) Briefly describe the steps that are used to develop a forecasting model. (6 marks)
- (c) (i) What is a time series forecasting model? (3 marks)
- (ii) What is the difference between a causal model and a time series model? (3 marks)
- (d) (i) What are the major problems faced by managers when forecasting? (4 marks)
- (ii) What kind of advice would you give to your management in your company concerning forecasting problems? (4 marks)

QUESTION 2

The sales (in sh'000) of swimwear by a large department store for each period of three months and trend values found using moving averages are as follows:

| Quarter | 20X4 | | 20X5 | | 20X6 | | 20X7 | |
|---------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|
| | <u>Actual</u> Sh000 | <u>Trend</u> Sh000 | <u>Actual</u> Sh000 | <u>Trend</u> Sh000 | <u>Actual</u> Sh000 | <u>Trend</u> Sh000 | <u>Actual</u> Sh000 | <u>Trend</u> Sh000 |
| First | | | 8 | | 20 | 40 | 40 | 57 |
| Second | | | 30 | 30 | 50 | 45 | 62 | |
| Third | | | 60 | 31 | 80 | 50 | 92 | |
| Fourth | 24 | | 20 | 35 | 40 | 54 | | |

Using the additive model, seasonal variations have been determined as follows:

| Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 |
|------------|-----------|------------|------------|
| -sh.18,250 | +Sh.2,750 | +Sh.29,750 | -Sh.14,250 |

Required:

Forecast sales for the last quarter of 20X7 and the first quarter of 20X8, stating any assumptions.

(20 marks)

QUESTION 3

RJ Ltd is a supplier of surgical instruments and medical supplies. The company is doing well and now needs additional capital to expand its operations.

The following financial statements are given below:

Extracts from Income Statement for the year ended 31 December 20X5.

| | |
|--------------------|---------------|
| | Sh.000 |
| Revenue | 30,120 |
| Costs and expenses | <u>22,500</u> |
| Operating profit | 7,620 |
| Finance costs | <u>2,650</u> |
| Profit before tax | 4,970 |
| tax | 1,491 |

Note: dividends declared for 20X5 are sh.1,392,000.

Balance Sheet as at 31 December 20X5

| | Sh.000 | Sh.000 |
|---------------------------------|---------------|----------------------|
| ASSETS | | |
| Non-current assets | | 14,425 |
| <u>Current assets:</u> | | |
| Inventories | 4,510 | |
| Trade receivables | 3,700 | |
| Cash | <u>198</u> | |
| | | <u>8,408</u> |
| TOTAL ASSETS | | <u><u>22,833</u></u> |
| EQUITY AND LIABILITIES | | |
| <u>Equity</u> | | |
| Share capital | 8,350 | |
| Retained earnings | <u>4,750</u> | 13,100 |
| | | |
| <u>Non-current liabilities:</u> | | |
| (Secured bonds, 6% 20X8) | | 4,000 |
| | | |
| <u>Current liabilities</u> | | |
| Trade payables | | |
| Other payables | 2,850 | |
| (tax and dividends) | | |
| | <u>2,883</u> | |
| | | <u>5,733</u> |
| | | <u><u>22,833</u></u> |

Additional information:

1. Revenue is expected to increase by 10% per annum in each of the financial years ending 31 December 20X6 and 20X7. Costs and expenses, excluding depreciation, are expected to increase by an average of 5% per annum. Finance costs are expected to remain unchanged.
2. RJ Ltd expects to continue to be liable for tax at the rate of 30%. Assume tax is paid or refunded the following year that in which the liability or repayment arises.
3. The ratios of trade receivables to revenue and trade payable to costs and expenses will remain the same for the next two years. The value of inventories is likely to remain at 20X5 levels.
4. The non-current assets are land and buildings, which are not depreciated in RJ Ltd's books. Capital (tax) allowances on the buildings may be ignored. All other assets used by the entity (machinery, vehicles etc) are leased on operating leases.
5. Dividends will be increased by 5% each year.
6. RJ Ltd intends to purchase for cash new machinery to the value of sh.6 million during 20X6. It will be depreciated using straight line basis over 10 years. RJ Ltd intends to charge a full year's depreciation in the first year of purchase of its assets. Capital (tax) allowances are available at 25% reducing balance on this expenditure.

RJ Ltd's main financial objectives for the years 20X6 – 20X7 are to earn a pre-tax return on the closing book of equity of 35% per annum, and a year-on year increase in earnings of 10%.

Required:

Assume you are a consultant working for RJ Ltd. Evaluate the implications of the financial information you have obtained. You should:

- (i) Provide forecast income statements, dividends and retentions for the two years ending 31 December 20X6 and 20X7. (10 marks)
- (ii) Provide cashflow forecasts for the years 20X6 and 20X7. Comment briefly on how RJ Ltd might finance any cash deficit. (6 marks)
- (iii) Discuss the key aspects and implications of the financial information you have obtained in your answer to parts (i) and (ii), in particular whether RJ Ltd is likely to meet its stated objectives. Provide whatever calculations you think are appropriate to support your discussion. (4 marks)

QUESTION 4

A company has the following data on its profits and advertising expenditure over the last 6 years:

| Year | Profits Sh.millions | Advertising Expenditure Sh.millions |
|------|------------------------|--|
| 20X1 | 11.3 | 0.52 |
| 20X2 | 12.1 | 0.61 |
| 20X3 | 14.1 | 0.63 |
| 20X4 | 14.6 | 0.70 |
| 20X5 | 15.1 | 0.70 |
| 20X6 | 15.2 | 0.75 |

Required:

- (a) Compute the correlation coefficient. (8 marks)
- (b) Determine the least-squares regression line (model) (8 marks)
- (c) Forecast the profits for next year if an advertising budget of sh.0.8 million is allocated. (4 marks)
- (Total marks = 20)

QUESTION 5

- (a) Demand for patient surgery at Coast General Hospital has increased steadily in the past few years, as seen in the following table.

| YEAR | OUTPATIENTS SERGERIES PERFORMED |
|------|------------------------------------|
| 1 | 45 |
| 2 | 50 |
| 3 | 52 |
| 4 | 56 |
| 5 | 58 |
| 6 | |

The director of medical services at the hospital predicted six years ago that demand in year 1 would be 42 surgeries.

Required:

- Using exponential smoothing with a weight of $\alpha = 0.20$, develop forecasts for years 2 through 6. What is the MAD? (10 marks)
- (b) Room registrations in the Mtopanga Towers Plaza Hotel have been recorded for the past nine years. Management would like to determine the mathematical trend of guest registration in order to project future occupancy. This estimate would help the hotel determine whether a future expansion will be needed. The following time series data for the past 9 years is given as follows and room registrations are in thousands.

| | | | | |
|-----------|------------|-----------|-----------|-----------|
| Year 1:17 | Year 2: 16 | Year 3:16 | Year 4:21 | Year 5:20 |
| Year 6:20 | Year 7:23 | Year 8:25 | Year 9:24 | |

Required:

- (a) Develop a regression equation (model) relating room registrations to times. (6 marks)
- (b) Forecast 10th year registration. (4 marks)