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**University Examinations 2015/2016**

FOURTH YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF COMMERCE

**BFC3478: FINANCIAL MODELLING AND FORECASTING**

**DATE: NOVEMBER 2015 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Jerusalem Ltd presented the following income statement for its period ending December 2014.

|  |  |
| --- | --- |
|  | **Shs.** |
| Sales | 3, 750, 000 |
| Variable cost | 2,250, 000 |
| Fixed cost | 450, 000 |
| Depreciation | 225,000 |
| EBIT | 825, 000 |
| Interest | 105, 000 |
| PBT | 720, 000 |
| Tax | 252, 000 |
| PAT | 468, 000 |
| Dividend | 372, 000 |
| Retained earnings | 93, 600 |

**Additional information:**

1. The sales are expected to grow at 15%
2. Variable costs are always 60% of the sales.
3. Fixed costs are expected to grow at 10%
4. Depreciation is charged at 3% on the book value
5. Current assets are based on 70% of gross assets
6. Interest is charged at 10% non-reducing.
7. Debt repayment will be suspended to finance growth and additional capital injected.
8. Tax rate is 35%
9. Dividend payout ratio is 80%
10. Current ratio is 2:1.
11. Total assets turnover ratio is expected to improve for 35%

**Required:**

1. Prepare a proforma income statement and balance sheet for 2015. (20 Marks)
2. Describe the basic steps in forecasting (6 Marks)
3. How is sensitivity analysis different from scenario analysis? (4 Marks)

**QUESTION TWO (20 MARKS)**

The following information relates to the demand of the drug hiss in Meru town since the year 2010.

|  |  |  |
| --- | --- | --- |
| **Year** | **Actual** | **Forecast** |
|  | Sachets | Sachets |
| 2010 | 252, 000 | 254, 600 |
| 2011 | 240, 000 | 239, 200 |
| 2012 | 258, 000 | 257, 600 |
| 2013 | 240, 000 | 242, 400 |
| 2014 | 246,000 |  |

**Required:**

Forecast the demand for the year 2009 (actual demand is provided) using the following Models

1. Three period Moving average. (3 Marks)
2. Weighted moving average. (Use the weights of 0.6, 0.3) (4 Marks)
3. Exponential smoothing. (Use α=0.15) (3 Marks)
4. List and explain the major qualitative forecasting techniques (5 Marks)
5. Explain any **FIVE** variations that may be observed in a Time series Data. ( 5Marks)

**QUESTION THREE (20 MARKS**

Musee consultants were hired by Meru County Government to establish the relationship between sales and profits of an income generating unity of the county Water Ministry. The consultants collected the information indicated below and analyzed it using Ms Excel Data Analysis tool. Mario, the lead consultant has approached you to assist him in the successful completion of the research project.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Kshs ‘Million’** | | | | | | | | | | | |
| Sales | 1470 | 420 | 1260 | 840 | 2940 | 3150 | 3360 | 2520 | 2040 | 4200 | 3150 | 1470 |
| Profits | 63 | 42 | 70 | 63 | 105 | 113.4 | 100.8 | 84 | 113.4 | 184.8 | 142.8 | 71.4 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT | | |  |  |  |  |
|  |  |  |  |  |  |  |
| Regression Statistics | |  |  |  |  |  |
| Multiple R | 0.9118 |  |  |  |  |  |
| R Square | 0.8314 |  |  |  |  |  |
| Adjusted R Square | 0.8145 |  |  |  |  |  |
| Standard Error | 17.0822 |  |  |  |  |  |
| Observations | 12 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance*  *F* |  |
| Regression | 1 | 14,386.18 | 14,386.18 | 49.30 | 0.00 |  |
| Residual | 10 | 2,918.01 | 291.80 |  |  |  |
| Total | 11 | 17,304.19 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *tStat* | *P-*  *value* | *Lower 95%* | *Upper 95%* |
| Intercept | 24.9979 | 11.2675 | 2.2186 | 0.0508 | (0.1076) | 50.1034 |
| Sales | 0.0308 | 0.0044 | 7.0215 | 0.0000 | 0.0210 | 0.0406 |

**Required:**

1. Sketch the data a suitable graph (4 Marks)
2. Indicate the linear regression equation obtained from the regression statistics (2 Marks)
3. Interpret the overall performance of the model as well as the parameters (4 Marks)
4. Using the information provided, estimate the profits when sales are Ksh.350, million. (3 Marks)
5. Explain the basic assumptions underlying linear regression equation (3 Marks)
6. Explain **FOUR** components of time series analysis (4 Marks)

**QUESTION FOUR (20 MARKS)**

The following information relates to Wazeia Traders for the year 2010.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1st July 2010 cash at bank | 171,000 |  |  |  |
| Salaries and wages estimated | 36, 000 |  |  |  |
| Interest payable on 31st August 2010 | 21,000 |  |  |  |
|  |  |  |  |  |
|  | June | July | August | September |
| Estimated Cash Sales | 306,000 | 426,000 | 462,000 | 369,000 |
| Credit sales | 306,000 | 246,000 | 426,000 | 366,000 |
| Purchases | 486,000 | 516,000 | 726,000 | 546,000 |
| Other expenses Payable in month | | 66,000 | 72,000 | 69,000 |

Notes:

1. All amounts are stated in Kshs.
2. Credit sales are collected 50% in the month the sales are made, 50% in the month following the sales. Collection from credit sales are subject to 5% discount if, payment is received in the month of sales and 2.5% if payment is received in the following month. 10% of the creditors are paid in the month of purchase while the rest are paid the following month.

**Required:**

1. Prepare a cash budget clearly showing the cash inflows, cash outflows and net cash flows (9 Marks)
2. Explain briefly any **SIX** Limitations of budgeting (6 Marks)
3. Explain difference between Jury of executive opinion and Delphi method of qualitative forecasting.

(5 Marks)

**QUESTION FIVE (20 MARKS)**

1. Nyota group of companies deal in sale of Toys in the past, it sold an average of 2, 000 toys each year. On the average each year, it sold 400 units in quarter one, 700 in quarter two, 600 in quarter three and 300 in quarter four. What will be the forecast for next year sale? (6 Marks)
2. The demand and forecast information of Jamii company over a 12 month period is shown in the following table.

|  |  |  |
| --- | --- | --- |
| Period | Demand | Forecast |
| 1 | 3,200 | 3,046 |
| 2 | 4,400 | 3,620 |
| 3 | 4,000 | 4,194 |
| 4 | 3,200 | 4,766 |
| 5 | 5,000 | 5,254 |
| 6 | 7,000 | 5,914 |
| 7 | 6,600 | 6,486 |
| 8 | 6,400 | 7,060 |
| 9 | 7,800 | 7,634 |
| 10 | 9,400 | 8,206 |
| 11 | 8,600 | 8,780 |
| 12 | 8,800 | 9,354 |

**Calculate:**

1. Mean absolute deviation (MAD) (4 Marks)
2. Mean absolute percentage error (MAPE) (4 Marks)
3. Mean square error (MSE) (4 Marks)
4. Running sum forecast errors (RSFE) (4 Marks)
5. Tracking signal (4 Marks)
6. Assuming that the control limits for the tracking signal are ± 3, what can be concluded about the quality forecast? (4 Marks)