

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF MASTERS OF BUSINESS ADMINISTRATION

MSOM 825: BUSINESS FORECASTING

STREAMS: MBAD

TIME: 3 HOURS

DAY/DATE: MONDAY 10/12/2018

2.30 PM – 5.30 PM

INSTRUCTIONS:

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE

- (a) How do forecasts contribute to decision making process in organizations? [10 marks]
- (b) Explain the following qualitative decision models highlighting the strength and weaknesses of each
- (i) Delphi method [3 marks]
 - (ii) Sales force polling [3 marks]
 - (iii) Jury of executive opinion [3 marks]
 - (iv) Consumer surveys [3 marks]
- (c) A business analyst has gathered the following historical annual returns on stock N for the last 12 years.

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]

- (d) The following is data on cash flow from an investment project for XYZ ltd

Year (t)	Actual cash flows (Y_t) in kshs. 000)
1	30.0
2	31.5
3	29.0
4	34.5
5	32.5
6	36.0

Suppose you wish to apply exponential smoothing model to predict future cashflows using $\alpha = 0.04$ as the exponential constant

- (i) Using three period average as the initial forecast, obtain the following predicted cash flows Y'_4, Y'_5, Y'_6 and Y'_7 [4 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 higher value of exponential constant, $\alpha = 0.5$. which of the two constants would you recommend and why? [4 marks]

QUESTION TWO

- (a) Describe the characteristics that distinguish qualitative and quantitative forecasting techniques. [8 marks]
- (b) 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 [4 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]

QUESTION THREE

- (a) Explain the meaning of the following pair of terms used in business forecasting (in each case provide a supporting example)
- (i) Time series and cross-sectional data [4 marks]
- (ii) Seasonal variation and random variation [4 marks]
- (b) The sales of product “X” from a B&Q store in Mombasa are as follows:

Year	January	February	March	April
Quantity sold (000's)	100	85	105	95

Given that the algorithm for simple exponential smoothing is defined by the following equation;

$$\hat{y}_t = \alpha y_t + (1-\alpha)\hat{y}_{t-1}$$

(Assume $\hat{y}_0 = 96.25$ and $\alpha = 0.2$)

- (i) Calculate the estimates for underlying demand for January, February, March and April. [8 marks]
- (ii) Using the Theil U-Statistic, comment on the accuracy of the model. [4 marks]

QUESTION FOUR

- (a) Outline the basic considerations when selecting the right forecasting model. [4 marks]
- (b) Sales data (in Units) of a microwave oven manufacturer are given below.

		Method A	Method B
Month	Actual Sales (A)	Forecast (F)	Forecast (F)
January	30	28	27
February	26	25	25
March	32	32	29
April	29	30	27
May	31	30	29

A company is comparing the accuracy of two forecasting methods. Forecasts using both methods are shown below along with the actual values for January through May. The company also uses a tracking signal (TS) with ± 4 limits to decide when a forecast should be reviewed. Which forecast method is the best? Explain [8 marks]

- (c) Company A and B operate in a competitive mobile phone industry. Currently, the two firms A and B share the market in the ratio of 60% to 40% respectively of the subscribers. If in every year, 70% of A's subscribers are retained but 30% switch to company B, where as 80% of B's subscribers are retained but 20% percent switch to company A. It is estimated

that the number of subscribers on mobile phone in the industry in two years' time will be 50. Million.

- (i) What will be the forecast number of subscribers for company A then? [4 marks]
- (ii) Determine the long-run condition for the industry [4 marks]

QUESTION FIVE

- (a) Under what conditions would you choose to use simple exponential smoothing. Holt's exponential smoothing and Brown's exponential smoothing? [6 marks]
- (b) The sales data for recently introduced "Z" plant pots from China are shown in the table below:

Week	1	2	3	4	5	6	7	8	9	10
Quantity Sold (000's)	29	24	27	25	26	27	30	28	28	27

Given that the usual form of Holt's two parameter exponential smoothing procedure for calculation purposes is as follows: $l_T = \alpha y_T + (1-\alpha)(l_{T-1} + b_{T-1})$

$$b_T = \beta(l_T - l_{T-1}) + (1 - \beta)b_{T-1}$$

Assume $l_0 = 24.5$, $b_0 = 0.4167$, $\alpha = 0.2$ and $\beta = 0.1$

- (i) Interpret the meaning usually given to l_T and b_T [4 marks]
- (ii) Obtain the estimates for the level and growth rate for the first 5 weeks. [8 marks]
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