

CHUKA



UNIVERSITY

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**UNIVERSITY EXAMINATIONS**
**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF COMMERCE**
**BCOM 463: BUSINESS FORECASTING**
**STREAMS: BCOM Y4S1**
**TIME: 2 HOURS**
**DAY/DATE: THURSDAY 06/12/2018**
**8.30 A.M – 10.30 A.M**


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**INSTRUCTIONS**

- Answer question one and any other two questions

1. (a) How do forecasts contribute to decision making process in organizations? [10 marks]

(b) Explain the following qualitative decision models highlighting the strength and weakness of each

(i) Delphi method [2 marks]

(ii) Market research [2 marks]

(iii) Jury of executive opinion [2 marks]

(b) A management scientist has gathered the following historical returns on stock N for the last 5 years.

Year	Returns %
2013	7
2014	9
2015	11
2016	13
2017	17

**Required :**

(i) Fit a trend line of the form  $y = a + bt$  on the time series data. [4 marks]

(ii) Hence project the return on the share for the year 2020. [2 marks]

(c) The following is data on cash flow an investment project for XYZ ltd.

Year (t)	Actual cash flows ( $Y_t$ ) in ksh '000'
1	30.0
2	31.5
3	29.0
4	34.5
5	32.0
6	36.0
7	37.5

Suppose you wish to apply exponential smoothing model to predict future cash flows using  $\alpha = 0.4$  as the exponential constant.

**Required :**

- (i) Using three period average as the initial , obtain the following predicted cash flows  $Y'_4, Y'_5, Y'_6$  and  $Y_7$  .

[4marks]

- (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]

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

- (b) The following information relates to quarterly profit (ksh Million) earned by firms in growth enterprise market segment of the NSE.

Year	Q1	Q2	Q3	Q4
2019	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 deseasonalised data is  $y=5.982 +0.1731t$ , obtain the forecast earnings for the third quarter of 2012.
3. (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’	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  $\hat{y}_0 = 100$  and  $\alpha = 0.2$ )

- (i) Calculate the estimates for underlying demand for January, February, March and April.
- (ii) Using the theil U-statistics, comment on the accuracy of the model.
4. (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 in the table along with the actual values for January through may.

The company also uses a tracking signal (TS) with  $\pm 4$  limits to decide when a

forecast should be reviewed. Which forecasting methods 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 5.0 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]

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