CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF COMMERCE

BCOM 463: BUSINESS FORCASTING

STREAMS: BCOM Y4S1 **TIME: 2 HOURS**

DAY/DATE: FRIDAY 24/09/2021 **11.30 A.M – 1.30 P.M**

INSTRUCTIONS

- **Answer question one and any other two questions**

QUESTION ONE

(a) In what ways do forecasts contribute to decision making process of organizations? [10 marks]

(b) Explain the meaning of the following pair of terms used in business forecasting.

(i) Qualitative and quantitative forecasts [4 marks]

(ii) Short range long range forecasts. [4 marks]

(c) 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]

(d) The prevailing interest rate is believed to predict loan applications in the financial sector. A manager at Equity bank in charge of operations has gathered the following historical data on number of loan applications per year and monthly interest rate charged on the loans over a span of 12 years.

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Applicants	15	20	14	16	25	20	20	23	14	22	18	18
Rate (%)	0.9	1.9	1.1	1.4	2.3	1.2	1.2	2.2	0.7	1.3	1.5	1.7

Required :

(i) Fit the regression equation on the data using least squares method. [6 marks]

(ii) Hence forecast the number of applications if the monthly interest rate is 2.5%. [2 marks]

(iii) At 95% confidence level, determine the confidence interval for the forecast in (ii) above. [4 marks]

QUESTION TWO

(a) Discuss the considerations that could limit application of business forecasts in decision making. [6 marks]

(b) Under what circumstances would a business forecaster choose to use simple exponential smoothing instead of holt's Trend corrected exponential smoothing model? [2 marks]

(c) The table below displays data on annual output in (000 units) of product Q produced by XYZ ltd.

Year (t)	1	2	3	4	5	6	7	8	9	10
Output (Y_t)	60	64	58	66	70	60	70	74	62	74

Suppose you wish to reply exponential smoothing model to predict future output levels using α = 0.65 as the exponential constant. A four year average will be used to initialize the forecast.

Required :

(i) Obtain the forecast values. [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 lower value of exponential constant α = 0.5. Which of the two constants would you recommend and why? [4 marks]

QUESTION THREE

(a) Explain the meaning of the following pair of terms used in business forecasting (in each case provide a support example)

(i) Time series and cross sectional data. [4 marks]

(ii) Seasonal variation and random variation. [4 marks]

(b) The sale data recently introduced spark -7 Android phones from China are shown in the table below:

Week	1	2	3	4
Quantity sold (000'0)	29	24	27	25

Given that the usual form of Holt's two parameter exponential smoothing procedure for calculation purposes is as follows:

$l_T = \propto\ y_T + (1-\propto)(l_{T-1} + b_{T-1})$

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

(Assume $l_0 = 24.5, b_0 = 0.4167, \propto = 0.2\ and\ y = 0.1$)

(i) Interpret the meaning usually given to l_T and b_T. [4 marks]

(ii) Obtain forecasts for week 1 -4. [6 marks]

(iii) Using period 1 as point of reference, estimate a three week period a head sales forecast. [2 marks]

QUESTION FOUR

(a) Outline the basic principles underlying forecasting. [4 marks]

(b) The following information relates to quarterly demand for Ndimu product over a three year period.

Year	Q1	Q2	Q3	Q4
2018	5.8	5.1	7.0	7.5
2019	6.8	6.2	7.8	8.4
2020	7.0	6.6	8.5	8.8

Required :
Calculate the trend in the data using centered for quarterly moving average. [6 marks]

(c) Monthly sales of eggs (in trays) for poultry farmer are given below.

		Exponential smoothing	Time series
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 management scientist is comparing the accuracy of the forecasting methods. Forecasts using both methods are shown along with the actual values for January through May. The scientists uses a tracking signal (TS) with $\pm$ 4 limits to decide when a forecast should be reviewed. Which forecasting method is the best? Explain. [10 marks]
