Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2013/14

COURSE NAME	:	PRODUCTION FORECASTING
COURSE CODE	:	BPC 33003
PROGRAMME	:	3 BPB
EXAMINATION DATE	:	JUNE 2014
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 (a) The number of defects in the Roll Forming production line is given in the **Table Q1(a).**

Table Q1(a)

Year	No. of defects	Year	No. of defects
1985	2413	1992	2362
1986	2407	1993	2334
1987	2403	1994	2362
1988	2396	1995	2336
1989	2403	1996	2344
1990	2443	1997	2384
1991	2371	1998	2244

(i) Compute the first differences for these data.

(3 marks)

(ii) Plot the original data and the difference data as a time series.

(3 marks)

(iii) Determine whether there is a trend in either of these series.

(4 marks)

(b) The Roll Forming Limited, would like to analyze the profit portfolio for the years 2003 to 2008. The data are shown in **Table Q1(b).**

Table Q1(b)

Loans	31 March	30 June	30 September	31 December
2003	2313	2495	2609	2792
2004	2860	3099	3202	3161
2005	3399	3471	3545	3851
2006	4458	4850	5093	5318
2007	5756	6013	6158	6289
2008	6369	6568	6646	6861

(i) Compute the autocorrelations for time lags 1 and 2.

(10 marks)

(ii) Determine whether these autocorrelation coefficients are significantly different from zero at the 0.05 significant level.

(5 marks)

Q2 Amin Trust Fund invests primarily in technology stocks. The prices of the fund at the end of each month for the 12 months of 2008 are given in **Table Q2**.

Table Q2

Month	Mutual Fund Price (RM)
January	19.39
February	18.96
March	18.20
April	17.89
May	18.43
June	19.98
July	19.51
August	20.63
September	19.78
October	21.25
November	21.18
December	22.14

(a) (i) Calculate the forecast value of the trust fund for each month by using a naïve model. The value for December 2007 was 19.00.

(5 marks)

(iii) Forecast the trust fund price for January 2009 using the naïve model.

(5 marks)

(b) Evaluate these forecasting methods using MAPE, MAD and MSD.

(10 marks)

(c) Compare both forecasting methods based on MAPE, MAD and MSD, which method much better made using in forecasting.

(5 marks)

Q3 The yield on a general obligation bond for the city of Batu Pahat fluctuates with the market. The monthly quotations for 2008 are given in the **Table Q3**.

Table Q3

Month	Yield
January	9.29
February	9.99
March	10.16
April	10.25
May	10.61
June	11.07
July	11.52
August	11.09
September	10.80
October	10.50
November	10.86
December	9.97

(a) Compute the forecast value of the yield on the obligation bonds for each month, starting with;

(i) April, by using a three-month moving average.
(ii) June, by using a five-month moving average.

(12 marks)

(b) Compute these forecasting methods using;
(i) MAD
(ii) MSE
(iii) MAPE
(iv) MPE

(8 marks)

(c) Forecast the yield for January 2009 using the best technique.

(5 marks)

Q4 (a) If a linear regression equation is given as $y = b_0 + b_1x + e$. By using the least square method, show that

$$b_1 = \frac{\sum(X-\bar{X})(Y-\bar{Y})}{\sum(X-\bar{X})^2} \text{ and } b_0 = \bar{Y} - b_1\bar{X}$$

where $\bar{Y} = \frac{\sum Y_i}{n}$ and $\bar{X} = \frac{\sum X_i}{n}$

(10 marks)

(b) Data for player costs (X) and operating expenses (Y) for n = 26 in a volleyball league team are recorded and summarized as below (All data are in million ringgit) :

$\Sigma X = 680.9$, $\Sigma Y = 1377.2$, $\Sigma X^2 = 19072.35$, $\Sigma Y^2 = 75746.12$, $\Sigma XY = 3768.51$

(i) Assuming that there is a linear relationship between player cost and operating expenses.
Determine the equation for the fitted straight line using least square method and interpret the result.

(5 marks)

(ii) Determine R^2 with comment on the strength of the linear relation.

(5 marks)

(iii) Forecast operating expenses, if player costs are RM30.5 million.

(5 marks)

- END OF QUESTION -