Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2013/2014

COURSE NAME	:	PRODUCTION FORECASTING
COURSE CODE	:	BPC 33003
PROGRAMME	:	3 BPB
EXAMINATION DATE	:	DECEMBER 2013/JANUARY 2014
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTION

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

Q1 A local building products store has accumulated sales data for two-by-four lumber (in board feet) and the number of building permits in its area for the past 10 quarters.

Table Q1: Sales data for lumber and the number of building permits

Quarter	Building Permits, x	Lumber Sales (1000s of bd ft),y
1	8	12.6
2	12	16.3
3	7	9.3
4	9	11.5
5	15	18.1
6	6	7.6
7	5	6.2
8	8	14.2
9	10	15.0
10	12	17.8

(a) Develop a linear regression model for these data.

(8 marks)

(b) Calculate the strength of the linear relationship using correlation.

(12 marks)

(c) Determine the forecast for lumber given 10 building permits in the next quarter if the model appears to be relatively strong

(5 marks)

Q2 A computer software manufacturer has experienced the following demand for its Risk Simulator Forecasting software package.

Table Q3: The monthly quotations for 2013

Period	Units
1	56
2	61
3	55
4	70
5	66
6	65
7	72
8	75

(a) Calculate an exponential smoothing forecast using $\alpha = 0.4$.

(7 marks)

(b) Calculate an adjusted exponential smoothing forecast using:

(i) $\alpha = 0.4$

(6 marks)

(ii) $\beta = 0.2$

(6 marks)

(iii) Compare the accuracy of the two forecasts using MAD and cumulative error.

(6 marks)

Q3 Medium Prima is considering cutting back on its TV advertising in favor of business videos to be given to its customers. This action is being considered after Medium Prima CEO read a recent article in the Business Review. One thing the CEO would like to investigate before taking this action is the history of TV advertising in Malaysia, especially the trend cycle.

Table Q3: The total RM spent on Malaysia TV advertising, in millions.

Year	Y	Year	Y
1996	11424	2005	26891
1997	12811	2006	29073
1998	14566	2007	28189
1999	16542	2008	30450
2000	19670	2009	31698
2001	20770	2010	35435
2002	22585	2011	37828
2003	23904	2012	42484
2004	25686	2013	44580

(a) Plot the time series of Malaysia TV advertising expenditures.

(10 marks)

(b) Fit a linear trend to the advertising data and plot the fitted line on the time series graph.

(7 marks)

(c) Forecast TV advertising RM for 2014

(5 marks)

(d) Explain whether there is a cyclical component in TV advertising RM, based on result in **Q3(b).**

(3 marks)

Q4 Consider the data in Table **Q4** where X = weekly production expenditures and Y = weekly sales.

Table Q5: X versus Y

Y(RM)	X(RM
1,250	41
1,380	54
1,425	63
1,425	54
1,450	48
1,300	46
1,400	62
1,510	61
1,575	64
1,650	71

(a) Determine a significant relationship exist between production expenditures and sales based on r and t value.

(4 marks)

(b) State the prediction equation

(4 marks)

(c) Forecast sales for production expenditure of RM50.

(4 marks)

(d) Compute percentage of the variation in sales can be explained with the prediction equation.

(4 marks)

(e) Compute the amount of unexplained variation.

(4 marks)

(f) Compute the amount of total variation.

(5 marks)

-END OF QUESTION-