



**UTHM**  
Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2016/2017**

**TERBUKA**

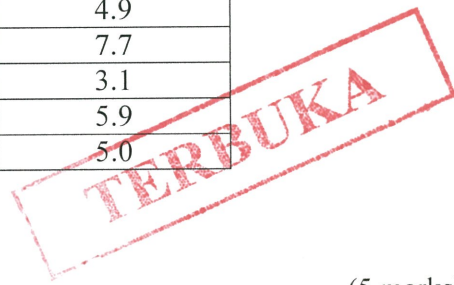
COURSE NAME : PRODUCTION FORECASTING  
COURSE CODE : BPC 33003  
PROGRAMME : BPB  
EXAMINATION DATE : DECEMBER 2016 / JANUARY 2017  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

**Q1** Ahmad is the manager of the AHA Furniture Sdn. Bhd. He would like to be able to predict wood table sales (tables per week) based on the amount of store space (in feet) provided. He gathers data for a sample of 11 weeks, as shown in the **Table Q1**.

**Table Q1: Data for a sample**

| Week | Tables Sold (Y) | Store Space (X) |
|------|-----------------|-----------------|
| 1    | 275             | 6.8             |
| 2    | 142             | 3.3             |
| 3    | 168             | 4.1             |
| 4    | 197             | 4.2             |
| 5    | 215             | 4.8             |
| 6    | 188             | 3.9             |
| 7    | 241             | 4.9             |
| 8    | 295             | 7.7             |
| 9    | 125             | 3.1             |
| 10   | 266             | 5.9             |
| 11   | 200             | 5.0             |

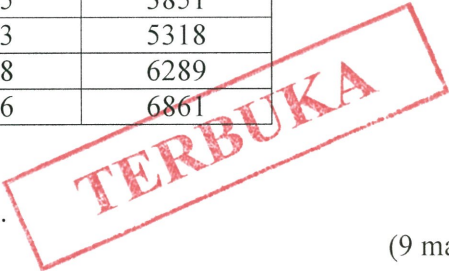


- (a) Plot a scatter diagram. (5 marks)
- (b) State the relationship between the two variables. (5 marks)
- (c) Compute the correlation coefficient. (7 marks)
- (d) Determine the equation of the least squares line by calculating the slope and Y-intercept. (6 marks)
- (e) Use equation in **Q1(d)** to forecast the number of tables sold if 5.2 feet of store space is used. (2 marks)

**Q2** The GTB Wood Sdn. Bhd., would like to analyse the profit portfolio for the years 2011 to 2016. The data are shown in **Table Q2**.

**Table Q2: The profit portfolio (RM)**

| Loans | 31 March | 30 June | 30 September | 31 December |
|-------|----------|---------|--------------|-------------|
| 2011  | 2313     | 2495    | 2609         | 2792        |
| 2012  | 2860     | 3099    | 3202         | 3161        |
| 2013  | 3399     | 3471    | 3545         | 3851        |
| 2014  | 4458     | 4850    | 5093         | 5318        |
| 2015  | 5756     | 6013    | 6158         | 6289        |
| 2016  | 6369     | 6568    | 6646         | 6861        |



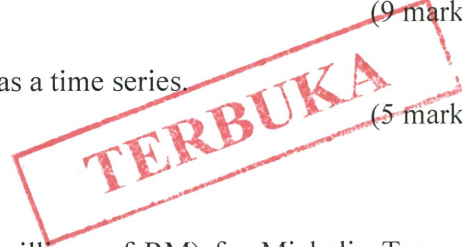
- (a) Compute the autocorrelations for time lag 1. (9 marks)
- (b) Compute the autocorrelations for time lag 2. (9 marks)
- (c) Determine whether these autocorrelation coefficients are significantly different from zero at the 0.05 significant level. (7 marks)

**Q3** Fareed Furniture Supply Chains Company uses an inventory management method to determine the monthly demands for various products. The demand values for the past 12 months of each product have been recorded and are available for future forecasting as presented in **Table Q3**.

**Table Q3: Demand for furniture in year 2016**

| Month     | Demand |
|-----------|--------|
| January   | 205    |
| February  | 251    |
| March     | 304    |
| April     | 284    |
| May       | 352    |
| June      | 300    |
| July      | 241    |
| August    | 284    |
| September | 312    |
| October   | 289    |
| November  | 385    |
| December  | 256    |

- (a) Forecast the demand for January 2017 using the exponential smoothing with a smoothing constant of 0.5 and an initial value of 205. (11 marks)
- (b) Evaluate these forecasting methods using the MAPE, MAD and MSD. (9 marks)
- (c) Plot the original data and the difference data as a time series. (5 marks)



**Q4** The quarterly production sales levels (measured in millions of RM) for Michelin Tyre are shown in **Table Q4**.

**Table Q4 : Michelin Tyre production sales (in millions of RM)**

| Year | Quarter |       |                    |                    |
|------|---------|-------|--------------------|--------------------|
|      | 1       | 2     | 3                  | 4                  |
| 2005 | 2,292   | 2,450 | 2,363              | 2,477              |
| 2006 | 2,063   | 2,358 | 2,316              | 2,366              |
| 2007 | 2,268   | 2,533 | 2,479              | 2,625              |
| 2008 | 2,616   | 2,798 | 2,656              | 2,746              |
| 2009 | 2,643   | 2,811 | 2,679              | 2,736              |
| 2010 | 2,692   | 2,871 | 2,900              | 2,811              |
| 2011 | 2,497   | 2,792 | 2,838              | 2,780              |
| 2012 | 2,778   | 3,066 | 3,213              | 2,928              |
| 2013 | 2,874   | 3,000 | 2,913              | 2,916              |
| 2014 | 2,910   | 3,052 | 3,116              | 3,210              |
| 2015 | 3,243   | 3,351 | 3,305              | 3,267              |
| 2016 | 3,246   | 3,330 | 3,340 <sup>a</sup> | 3,300 <sup>a</sup> |

<sup>a</sup> Value Line estimates

- (a) Develop the regression equation for trend line. (4 marks)
- (b) (i) Analyse this time series to get the four seasonal indexes. (4 marks)
- (ii) Determine the extent of the seasonal component in Michelin production sales. (4 marks)
- (c) Forecast for third and fourth quarters of 2015. (8 marks)
- (d) Compare your forecast to Value Line's. (5 marks)

**- END OF QUESTIONS -**