

University of Ruhuna

Bachelor of Science (Special) Degree

LEVEL II (Semester II) Examination-August 2017

Subject: Statistics

Course Unit: MST 4144 (Time Series Analysis- Practical)

Answer All Questions. No. of Pagers: Two (02)

Time: One (01) hour

Instructions:

- The outputs for each question should be stored in the Microsoft Word file under the question number and save the file as your index number
- Refer the MS Excel file for Table (01), Table (02) and Table (03).

(01) Table (01) gives the Real Personal Consumption Expenditures (RPCE) and Real Disposable Personal Income (RDPI) from the Economic Report of Central Bank, Sri Lanka over the period 1959–2007.

(a) Discuss the linear assumptions briefly.

[25 Marks]

(b) It is required to model RDPI in terms of RPCE. Obtain the OLS estimators of best fit.

[25 Marks]

(c) Discuss the adequacy of the fitted model and the model validations.

[25 Marks]

(d) Obtain the residual plot and comment on it.

[25 Marks]

(02) The following data represent the tea production (000 kg) in certain factory form 2012 to 2016.

Year	Quarter			
	I	II	III	IV
2012	16	21	9	18
2013	15	20	10	18
2014	17	24	13	22
2015	17	25	11	21
2016	18	26	14	25

- (a) By assuming the suitable model (additive or multiplicative), estimate the de-seasonalized series for the given data

[40 Marks]

- (b) Determine the trend line and estimate the cyclical variation around the trend line.

[40 Marks]

- (c) Forecast the tea production for the first two quarters of the year 2017.

[20 Marks]

- (03) (a) Develop a suitable ARIMA model for ASPI (2010-2015) data sample (Table 02) and predict the one-step-ahead forecast for the coming day.

[60 Marks]

- (b) Develop a suitable GARCH model for Table 03 data sample and discuss the model significance (Hint: Depending variable: MC).

[40 Marks]
