BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF COMMERCE

DEPARTMENT OF ECONOMICS

PROGRAMME: BSC ECONOMICS HONOURS DEGREE

EC217: COMPUTER AND STATISTICAL APPLICATIONS IN ECONOMICS:

DURATION: 3 HOURS

INSTRUCTIONS:

1. Answer all questions
2. Students should use the specified software packages to attempt each question.
3. All answers should be saved on one Microsoft word file. Use your registration number as the file name.
4. NO CELL PHONES ALLOWED in the examination room.

QUESTION 1

Part A: Microsoft excel

Microsoft Excel worksheet 1a shows the Institutional Quality Index (IQI) for a wide cross-section of countries in 2022. The higher the value the lower the quality.

Using Microsoft Excel worksheet 1a:

a) Construct a box and whisker plot for the IQ Index. **(7 marks)**

b) Prepare a frequency table for the IQ Index. **(5 marks)**

Microsoft Excel worksheet 1b shows Sales Index (SI) data for industrial products produced by a Zimbabwean firm.

Using Microsoft Excel worksheet 1b:

c) Prepare a chain linked index for the SI data using either of the 2 given years as your base. **(4 marks)**

d) You are told that sales go through 4 major cycles in a year, de-trend the consolidated series using an appropriate moving average series. **(6 marks)**

Microsoft Excel worksheet 1c shows average weekly crime records for three provinces in Zimbabwe.

Using Microsoft Excel worksheet 1c:

e) Draw a spider chart to compare weekly crime records by province. **(5 marks)**

Test the null hypothesis that average weekly crime record for province A is not different from that of province C. **(5 marks)**

f) Test the null hypothesis that the average weekly crime record in province B is 5. **(4 marks)**

QUESTION 2

Part B: SPSS

Using the data for average weekly crime records in Microsoft Excel worksheet 1c:

a) Using appropriate parametric test and non-parametric test, compare the conclusions you obtain after testing the null hypothesis that Provinces B and C record the same average weekly crime records. **(10 marks)**

b) Test the null hypothesis that all the three provinces record the same average weekly crime records. **(4 marks)**

c) Draw a bar chart to show the distribution of the total crime record for each province. **(3 marks)**

QUESTION 3

E-views questions

Import Microsoft Excel worksheet two to E-views and answer the following questions:

The production function for manufacturing enterprises in the paper and stationary sector is given as follows:

$$output = \alpha + \beta_1 labour + \beta_2 capital + \beta_3 materials + \beta_4 skill + \beta_5 formal + \mu$$

where, *output* = the number of reams of paper produced.

labour = total number of workers.

capital = value of capital invested.

materials = value of materials purchased.

skill = the proportion of skilled workers to total workers

formal = 1 if the enterprise is formal, 0 otherwise.

N.B. Formal enterprises receive subsidies when they buy materials.

i) Summarise the data for all the variables given in the model and comment. **(12 marks)**

ii) Estimate the regression model specified above using OLS. **(6 marks)**

iii) Perform any two diagnostic tests of your choice and comment on the results. **(8 marks)**

iv) Comment on the Durbin-Watson statistic and the coefficient of determination you obtained. **(6 marks)**

v) Plot the CUSUMQ graph and comment. **(5 marks)**

vi) Assuming the model was a Cobb-Douglas model, transform the model into a linear model compatible with OLS regression and re-estimate the model using OLS. **(10 marks)**

END OF PAPER