BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

MAR 2024

INSTRUCTIONS

Answer any *FOUR* questions. Each question carries **25 marks.**

1. It is generally assumed that Y is a random variable. It can be measured on four different scales. Explain four scales referred to. **[25 marks]**

2. With the aid of examples, explain three types of data that are generally available for analysis. **[25 marks]**

3. Table 1 gives per capita income to the nearest \$100 (Y) and the percentage of the economy represented by agriculture reported by the World Bank in 1999 for 15 African countries.
    (a) Estimate α and β **[5 marks]**
    (b) Test at the 5% level the statistical significance of the parameters **[7 marks]**
    (c) Calculate the coefficient of determination **[7 marks]**
    (d) Report the results obtained in part (a) in standard summary form. **[6 marks]**

Table 1: Per capita income and the percentage of the economy represented by agriculture reported by the World Bank

Y_i	X_i
6	76
10	16
44	9
47	8
23	14
19	11
13	12
19	11
8	18
44	5
4	26
31	8
24	8
59	9
37	5

4. a) Explain five consequences of imperfect collinearity. **[10 marks]**

   b) Explain three methods used to detect collinearity. **[15 marks]**

5. Explain how a qualitative variable such as gender is quantified and interpreted in the regression analysis **[25 marks]**

6. a) Explain five properties of estimators. **[10 marks]**
   b) Illustrate the effect of including an irrelevant variable in regression analysis.

   [15 marks

End of Paper