

**UNIVERSITY EXAMINATIONS: 2021**

**SCHOOL OF BUSINESS & PUBLIC MANAGEMENT**

**SPECIAL EXAMINATION FOR THE MASTER OF SCIENCE IN FINANCE AND ECONOMICS**

**MSF 502 ECONOMETRICS I**

**DATE: JULY, 2021 TIME: 4 HOURS**

**INSTRUCTIONS: Answer ALL Questions** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**NB**: Statistical t- and F- tables are provided on Moodle.

**QUESTION ONE (20 MARKS)** [For this question you **must not** use a statistical software and you have to clearly show all your working]

The data below shows the quantity of roses sold (, in dozen pieces) and the average price of roses (, in Kes. per dozen). Use the data to answer the questions that follow.

|  |  |
| --- | --- |
| Price, *x* (Kes. per dozen | Quantity sold, *y* (dozens) |
| 226 | 11484 |
| 254 | 9348 |
| 307 | 8429 |
| 291 | 10079 |
| 273 | 9240 |
| 277 | 8862 |
| 359 | 6216 |
| 323 | 8253 |
| 260 | 8038 |
| 289 | 7476 |
| 377 | 5911 |
| 364 | 7950 |
| 282 | 6134 |
| 296 | 5868 |
| 424 | 3160 |
| 369 | 5872 |

1. Compute the slope, and the constant, , with quantity sold as the dependent variable and price per dozen as the independent variable. (8 Marks)
2. Calculate the 95% confidence interval for the slope (8 Marks)
3. Interpret the meaning of the slope and explain if the average price of roses has a statistically significant effect on quantity of roses sold. (4 Marks)

**QUESTION TWO (20 MARKS)**

The partial output below was obtained when quantity of roses sold, *y,* (in dozens) was regressed against average wholesale price of roses, *x1*, (Kes per dozen) average wholesale prices of carnations, *x2*, (Kes. per dozen), and average family disposable income, *x3*, (Kes) per week.

|  |  |  |
| --- | --- | --- |
| ANOVA | | |
|  | *df* | *SS* |
| Regression | 3 | 48695532 |
| Residual | 12 | 13900824 |
| Total | 15 | 62596356 |

|  |  |  |
| --- | --- | --- |
| COEFFICIENTS TABLE | | |
|  | *Coefficients* | *Standard Error* |
| Intercept | 13354.60 | 6485.42 |
| X1 | -3628.19 | 635.63 |
| X2 | 2633.75 | 1012.64 |
| X3 | -19.25 | 30.69 |

1. Evaluate if variation of quantity of roses sold explained by the regression model is statistically significant at 5% level. (6 Marks)
2. Suppose the average weekly monthly income for a family was increased by Kes. 1,000, holding all other factors constant, examine at 5% level if there would a statistically significant change in the quantity of roses sold. (4 Marks)
3. Compute the adjusted R-square for the model and interpret its meaning. (4 Marks)
4. Assess the statistical significance of the intercept, wholesale price of roses (*x1*), and wholesale price of carnations (*x2*). (6 Marks)

**QUESTION THREE (10 MARKS)**

1. The natural logarithm of earning per hour (lnwage) was regressed on years of education (*educ*), post education years of experience *(*exper) and usual hours worked per week (*hrswk*), using the regression model below.



The output below was obtained.

****

1. Interpret the meaning of the estimates for . (3 Marks)
2. Explain if these estimates significantly different from zero? (3 Marks)

b) As an initial step in a salary equity study, the human resources consultant performed a linear regression using the proposed model.

Where *Salary* is in thousands of shillings; binary variables are used for gender (*Male = 1, Female = 0*); *Exper* is the employee’s experience in years; age (*Over50yrs = 1, 50yrs or less = 0*); and MBA degree (*MBA = 1, Otherwise = 0*).

The output obtained is shown below.



Interpret the estimates for . (4 Marks)