"Investing in Africa's Future"

COLLEGE OF BUSINESS PEACE LEADERSHIP AND GOVERNANCE

NMEC 103: STATISTICS FOR ECONOMICS 1

END OF SECOND SEMESTER EXAMINATIONS

LECTURER: MS S CHIVASA

MAY 2021
TIME: 7 HOURS

INSTRUCTIONS

Answer **ONE** question.

Marks for each question are shown at the end of each Question

Show all your workings.

Write legibly

Credit will be awarded for logical, systematic and neat presentations

QUESTION 1 (60 Marks)

a. The grain marketing board carried out a survey on soya been yield. Thirty farmers were interviewed and their yield per hectare in tones is recorded below.

36 39 49 45 25 34 50 31 40 48 42 35 30 46 38

39 44 52 41 47 35 41 61 53 28 46 54 55 60 27

Required

i. Construct a frequency distribution using class intervals 25<30, 30<35, and so on [5]
ii. Draw the less than ogive curve and approximate the median yield. [5]
iii. Draw a frequency histogram and approximate the modal yield. [5]
iv. Using data from the frequency table in estimate the average soya bean yield per hectare. [5]
v. Estimate the median yield. [5]

b. After harvesting the soya bean, only eight farmers took some of their produce to grain marketing board. The number of tonnes sold and the revenue received by farmers is shown in table 1 below:

Table 1 Soya bean sold and revenue realised

Farmer	Soya beans sold (tonnes)	Revenue received (ZWL, 000)
1	10	12
2	12	16
3	8	10
4	15	20
5	9	11
6	10	9
7	7	8
8	14	17

i. Present the information graphically and comment [5]
ii. Estimate the regression equation that explains the relationship between soya beans sold and revenue received. [6]
iii. Using Pearson's correlation coefficient, determine the nature of the relationship between soya beans sold and revenue. [6]
iv. What is the proportion of revenue variation that is attributed to tonnage of soya beans sold? [6]

v. Estimate the possible the amount of revenue that can be received by the farmer after selling 35 tonnes of soya beans. [2]

c. At the market, it was not clear on the number of days that the farmers would wait before their soya bean is sold. It is generally known that farmers usually wait for an average of three days to sell their crops.

i. Estimate the probability that the farmers will wait for a day to sell their soya beans. [5]

ii. What is the probability that the farmers will not wait to sell their soya beans. [5]

Question 2 (60 marks)

a. Differentiate between the following terms as they are used in economic statistics;

i. Regression analysis and correlation analysis; [3]

ii. Confidence interval and level of significance; [3]

iii. Discrete and continuous data; [3]

iv. Frequency distribution and relative frequency distribution; [3]

v. Statistic and parameter. [3]

vi. Type 1 and type 11 error [3]

vii. Statistically independent and statistically dependent events [2]

b. The sales manager of an insurance company knows that the company's best sales can sell an insurance policy 60% of the time. If his person were to make 10 calls to sell insurance: Estimate the probability that;

i. At most 2 policies would be sold. [5]

ii. More than 2 but less than 4 policies would be sold. [6]

iii. Only 4 policies would be sold [5]

iv. Find the mean number of policies that would be sold. [4]

c. An experiment involves rolling of a die was done twice with replacement.

i. Construct a probability tree [4]

ii. Estimate a probability of getting exactly 2 sixes [4]

iii. Calculate the probability of getting a 1 [5]

iv. What is the probability of getting a 7 [3]

v. Find the probability of getting at least a 6 [4]

Question 3 (60 marks)

a. The works department is estimating the cost of constructing a perimeter wall. The works manager believes that the standard perimeter wall should be 25 metres high. To avoid confusion, the works director requested the section to carry out a research and 30 walls were sampled for the study. The average wall height was found to be 22 metres with a sample standard deviation of 8 metres.

i. Explain the difference between null hypothesis and alternative hypothesis [1]

ii. Under what circumstances can Z distribution tables be used instead of t distribution tables? [4]

iii. Test the works manager's hypothesis at 1% level of significance. [5]

iv. Can we come up with the same conclusion at 5% level of significance? [5]

v. Test the hypothesis at 1% significance level that the average height is at least 25 metres. [5]

b. At a children's home, the matron wanted to know the average number of soap tablets used by 25 children per year. The sample mean was found to be 170 tablets and the standard deviation of 22 tablets.

i. Using 95% confidence interval, estimate the actual mean tablets used by each child and comment. [5]

ii. What can we say about the mean at 90% confidence interval? [5]

c. Classify the following examples of data as ordinal, nominal, interval or ratio. Justify your classification.

i. Temperature of a patient; [4]

ii. Brand of a phone [4]

iii. Students' examination marks [4]

iv. Weight of babies at birth [4]

v. Evaluation score [4]

END OF EXAMINATION