



NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
2025_2 EXAMINATIONS

COURSE TITLE: APPLIED STATISTICS

COURSE CODE: ECO 452

UNITS: 2

TIME ALLOWED: 2 HOURS

INSTRUCTION: ANSWER QUESTION ONE (1) AND ANY OTHER TWO (2) QUESTIONS
QUESTION ONE CARRIES 30 MARKS WHILE OTHER QUESTIONS CARRY 20 MARKS EACH

- 1a.** Describe the descriptive measures that can be used in assessing a sample or population **(5 marks)**
b. Explain in details the standard deviation and sample variance of any given population **(5 marks)**
c. Explain the assumptions of a normal distribution **(5 marks)**
d. The information below relates to quantities of groundnut produced by Nigeria farm Nigeria Ltd. The production data are normally distributed with equal variance in the 3 sections for 6 months.

Months	Morning (x_1)	Afternoon (x_2)	Evening (x_3)
1	85	77	90
2	83	81	92
3	79	85	84
4	81	82	82
5	82	80	87

- (i) What is explained variation
(ii) What is unexplained variation
(iii) What is total variation.

(15 marks)

2a. A coin is tossed 120 times, find the probability that head will appear between 45% and 55%.

- b.** Describe the following components of time series
(i) Secular trend or long-term movement
(ii) Seasonal variation
(iii) Irregular or residual variation
(iv) Cyclical variation.

(20 marks)

3a. State and explain the null hypothesis of analysis of variance (ANOVA)

- b.** State and explain the divisions of the total variation in ANOVA

(20 marks)

4a. State and explain the assumptions of multiple regression

- b.** The quantity demanded for Apple denoted by Y is thought to be a linear function of price (X_1) and income (X_2). A sample of 6 pairs of price and income gave the value of quantity demanded shown in the table below:

Y	X_1	X_2
40	9	8
10	12	10
35	6	6
25	10	11
30	9	8

45	14	7
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(a) Find the least square regression equation of Y on X_1 and X_2 ; if $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \mu$ and $E(\mu) = 0$
(20 marks)

5. A population consists of four members 3, 7, 11, 15. Consider all possible samples of size of two that can be drawn without replacement from this population. Find

- (i) Population mean
- (ii) The population standard deviation
- (iii) The mean of the sampling distribution of means
- (iv) The standard deviation of the sampling distribution of means. **(20 marks)**