



**NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS
2021_2 EXAMINATION⁴⁵⁰⁷**

COURSE TITLE: APPLIED QUANTITATIVE ANALYSIS

COURSE CODE: ECO 729

UNITS: 2

TIME ALLOWED: 2 HOURS

INSTRUCTION: ANSWER QUESTION (ONE) AND ANY OTHER (TWO) QUESTIONS

Question 1

A small study is conducted involving 17 infants to investigate the association between gestational age at birth, measured in weeks, and birth weight, measured in grams. Thus X = gestational age, Y = birth weight. The data summations are summarized below.

The gestational age data as $\sum X = 652.1$, $\sum (X - \bar{X}) = 0$, $\sum (X - \bar{X})^2 = 159.45$

The birth weight data as $\sum Y = 49,334$, $\sum (Y - \bar{Y}) = 0$, $\sum (Y - \bar{Y})^2 = 7,767.660$,

Where $n = 17$ and $\sum (X - \bar{X})(Y - \bar{Y}) = 28,768.4$

- i. Compute the means gestational age and birth weight **(6 marks)**
- ii. Compute the variance of gestational age **(6 marks)**
- iii. Compute the variance of birth weight **(6 marks)**
- iv. Compute the covariance of gestational age and birth weight **(6 marks)**
- v. Compute the sample correlation coefficient **(6 marks)**

Question 2

- a) The number of traffic citations issued during the last five months in Abuja, Nigeria is: 38, 26, 13, 41, and 22. What is the population variance? **(10 marks)**
- b) An average light bulb manufactured by the Acme Corporation lasts 300 days with a standard deviation of 50 days. Assuming that bulb life is normally distributed, what is the probability that an Acme light bulb will last at most 365 days? **(10 marks)**

Question 3

- a) Consider the Benson Distributors sales of CD players shown in the Table below. Suppose that in the past, Benson had forecast sales for each year to be the sales that were actually achieved in the previous year. This is sometimes called a naïve model.

Year	Actual Sales of Compact Disc Players	Forecast sales	Absolute value of errors (Deviation) $ Actual - forecast $
2010	110	-	
2011	100	90	
2012	126	131	
2013	138	127	
2014	167	155	
2015	144	148	
2016	152	133	
2017	173	160	
2018	98	93	
2019	109	110	
2020		125	

- i. Compute the absolute value of the errors. **(8 marks)**
- ii. Calculate the Mean Absolute Deviation (MAD) **(4 marks)**
- iii. Forecasting for the next time period (year 2020) **(3 marks)**

b) In a simple graph define the Measures of Central Tendency **(5 marks)**

Question 4

Star Logistics Ltd has established that annual quantity for a given item is 4000 units. The cost of placing an order is ₦5000 and the price per unit is ₦ 2000. Inventory holding cost percentage is 20% of purchase cost. Formulate the best (optimal) entry policy for this item. That is, calculate

- i. Quantity to order (EOQ) **(5 marks)**
- ii. Frequency for ordering and when to order **(5 marks)**
- iii. Re-order level/point; For ROP take lead-time to be 15 days while one year has 300 working days **(5 marks)**
- iv. Total cost associated with the policy. **(5 marks)**