

DEPARTMENT OF GEOGRAPHY
SCHOOL OF PHYSICAL SCIENCES
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.

Undergraduate Examination for First Semester 2015/2016 Session.

Course Title: Advanced Quantitative Techniques (GRY 417P)

Course Unit: 3

Instructions: Answer any **Four (4)** questions in all. The use of relevant equations will be rewarded.

Time allowed: 2hours 30 minutes

1. (a) Discuss the merits and the demerits of (i) measure of central tendency (ii) measure of dispersion and (iii) measure of partitioning in statistical data analysis.
- (b) The table below shows marks (out of 10) obtained by 20 students in a test. Calculate the 1st, 2nd and 3rd quartile of the distribution.

Mark	1	2	3	4	5	6	7	8	9	10
Freq.	0	1	1	3	2	5	5	2	0	1

2. A planner hypothesizes that the awareness of people on certain development control measures differs significantly between Nigerian cities. The following data were obtained.

Cities	Development Control Measures				
	A	B	C	D	E
Ibadan	45	100	50	60	120
Lagos	250	150	90	200	150
Enugu	30	60	55	70	80
Kano	50	80	20	30	60

- (a) State the null hypothesis to be tested.
 - (b) Test this hypothesis at $\alpha = 0.05$ with any appropriate statistical technique.
3. (a) State the procedures involved in the computation of Spearman Rank Correlation Coefficient (ρ)
 - (b) Explain the differences between correlation and regression
 - (c) The data below shows levels of interaction (y) and distance (x)

Y	85	40	65	35	30	20	22	15	10	5
X	2	10	15	81	30	40	35	50	60	50

Calculate the Spearman rank correlation coefficient and test its significance

4. (a) Distinguish between coefficient of regression and coefficient of determination using relevant illustrations.
- (b) List five (5) assumptions of multiple linear regression.
- (c) The following set of equations were obtained from a researchers hypothesis that opined that solid waste generated in cities depends on the population size of the cities and the income per capital of the residents:

$$10a + 2b_1 + 3b_2 = 23$$

$$3b_1 + 8b_2 = 30$$

$$4b_2 = 12$$

Calculate the values of a , b_1 and b_2 using any appropriate method

5. (a) (i) Define an outlier in quantitative techniques
- (ii) Mention two methods of eliminating the effect of an outlier in a given set of data.
- (b) The frequency distribution of the marks in an examination was as follows

Class interval	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50
Frequency	2	3	5	X	12	13	9	Y	3	1

- i) Find the values of X and Y if the median is 25.5 and the upper quartile is 32.
- ii) Hence or otherwise compute the mode
6. (a) Distinguish between a parametric and a non parametric test in statistics. Give two examples of each.
- (b) A Nigerian airline wants to estimate the relationship between the numbers of reservations and the actual number of passengers who show up for flight AG740. Information gathered over 12 randomly selected days is shown in the table below:

Day	1	2	3	4	5	6	7	8	9	10	11	12
Reservations	250	548	156	121	416	450	462	508	307	311	265	189
No of passengers	210	405	120	89	304	320	319	410	275	289	236	170

- (i) Identify the dependent variable and explanatory variable.
- (ii) Draw a scattered diagram for the relation.
- (iii) Calculate the number of passengers expected on a day when 350 reservations have been made.
- (iv) Compute the reservations made when 145 passengers showed up.