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FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF GEOGRAPHY

FIRST SEMESTER 2013/2014 SESSION UNDERGRADUATE EXAMINATION

COURSE CODE: GRY 417P (3 Units)

COURSE TITLE: Advanced Quantitative Techniques

INSTRUCTIONS: Answer any four (4) questions of your choice. All questions carry equal marks.

TIME ALLOWED: 2hours 30 minutes

1. The Frequency distribution of the marks in an examination is as follows:

Class interval	1-5	6-10	11-20	21-30	31-35	36-40	41-45	46-50
Frequencies	2	3	10	3	5	15	12	10

- (a) Prepare a cumulative frequency table for the distribution (5mks)
(b) Use the table in (a) above to draw a histogram for the distribution
(c) From the histogram, estimate the modal mark.
2. It is suspected that there is some relationship between the relative humidity and tensile strength of a certain material. The following measurements are obtained.

Relative humidity(%)	45	55	65	80	95
Tensile strength	80	67	58	55	30

- (i) Use the information to plot a scatter diagram
(ii) Investigate the relationship between the relative humidity and tensile strength
(iii) Compute the least square (linear regression plane) in the two variables
(iv) Predict the tensile strength for 70% relative humidity
3. (a) In a moderately asymmetrical distribution the mode and mean are 25.6 and 36.5 respectively. What is the median

(b) A man travels from Minna to Abuja a distance of 140km at an average speed of 70km/h and returns to Minna along the same route. Find the average speed for the entire journey

(c) Compute the lower quartile, middle and the upper quartile of the following distribution

Score	11	12	13	14	15	16	17	18
Frequency	1	2	3	4	4	3	2	1

4. The yield of zea maize (y) was found to depend upon mean annual rainfall (x_1) and mean temperature (x_2) during the flowering stage according to the equation:

$$y = a + b_1x_1 + b_2x_2$$

Experimental data are obtained in order to find the constants a, b_1 and b_2 by the method of least squares. Summing over relevant values gives the following three equations :

$$2a + 3b_1 + 4b_2 - 20 = 0$$

$$6a + 2b_2 - 12 = 0$$

$$b_1 + b_2 - 5 = 0$$

- Use determinants to find the values of a, b_1 and b_2
 - Predict the yield of zea maize when the mean annual rainfall was found to be 1012mm and the mean temperature is 25°C
5. Research in Geography without the knowledge of Quantitative Techniques is obsolete. Discuss the relevance of this statement to Remote Sensing Application and Meteorology.
6. Discuss in detail the use of Statistical Package for Social Sciences (SPSS) in Geographical Research.