DEPARTMENT OF GEOGRAPHY
SCHOOL OF SCIENCE AND SCIENCE EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
FIRST SEMESTER EXAMINATION 2009/2010 SESSION.

COURSE TITLE: Advanced Quantitative Techniques (GRY 417P)

Instructions: Answer Question 1 and any other three (Four questions in all).

Time Allowed: 3hrs.

1. Discuss in detail the roles of Quantitative Techniques in Geographical Research. (15mks)

2. Three groups of students, 5 in each group, were receiving therapy for severe test anxiety. Group 1 received 5 hours of therapy, group 2- 10 hours of and group 3- 15 hours. At the end of the therapy each subject completed an evaluation of test anxiety.

   (a) Explain the meaning of the word "subject" as used in the question and state its numerical value (2mks)

   (b) Which of the statistical variable does " test anxiety" represent (1mk)

   (c) What effect does the amount of therapy have on the level of test anxiety? (12mks)

Group 1(5 hours)	Group 2 (10 hours)	Group 3 (15hours)
48	55	51
50	52	52
53	53	50
52	55	53
50	53	50

3. The yield of a certain crop (Z) depends upon the amounts of rainfall (x) and Temperature (y) during the flowering stage according to the equation:

$$Z = a + b_1x + b_2y$$

Over the range considered. Experimental data are obtained in order to find a bi and b2 by the method of least squares. Summing over the relevant values gives the following three equations which have to be solved.

$$27 - 3a - 10b1 - 4b2 = 0$$
$$19 - 2a - 5b1 - 4b2 = 0$$
$$25 - 2a - 10b1 - 6b2 = 0$$

Use determinants to find a, b_1 and b_1.

4. The table below relates the yield of con to two independent variables x1 and x2.

N	1	2	3	4	5
X1	6	12	18	24	30
X2	16	8	4	2	6
y	50	60	70	80	80

(a) Compute the least square regression plane in the three variables. (6mks)

(b) Test the goodness of fit by computing the coefficient of determination and the adjusted coefficient of multiple determination (6mks)

(c) Test the overall significance of the regression by computing F at 95% confidence limit and $\alpha = 0.05$ (3mks)

5. (a) Differentiate between product moment correlation coefficient and rank correlation coefficient. Give reasons why rank correlation coefficient is used. (6mks)

(b) Explain what you understand by the term: (i) regression analysis

(ii) Analysis of variance (ANOVA) (iii) Trend analysis (9mks)

6. (a) Distribution of primary schools(P) is supposed to be population-specific. It is also often assumed as a planning standard that every community with at least 5,000 people should have at least 1 primary school. The data below was obtained for Niger State. Using the spearman Correlation coefficient, find out if there is any relationship between population (Q) and the number of primary schools in each of the selected Local Governments Areas. (10mks)

;A.	Bosso	Chanchaga	Rafi	Lavun	Edati	Agwara	Kontagora	Bida	Suleja	Lapai
	149472	103501	143017	185925	136519	134271	247373	316925	131639	102138
	50	40	54	72	108	50	35	63	60	40

(b) 25 boats make 8 transatlantic trips each per annum and 15 boats make 5 trips per annum. What is the average number of days for a turn-around? Take 360 days = 1 year. (5mks)