



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

THIRD YEAR SECOND SEMESTER EXAMINATIONS FOR
THE DEGREE OF BACHELOR OF ARTS IN URBAN &
REGIONAL PLANNING WITH INFORMATION
TECHNOLOGY
(MAIN CAMPUS)

NPL 308: QUANTITATIVE TECHNIQUES II

Date: 19th April, 2012

Time: 9.00 – 11.00 a.m.

INSTRUCTIONS:

- ◆ Answer QUESTION ONE and any other TWO questions.

NPL 308: QUANTITATIVE TECHNIQUES II

Q1. The following data were collected regarding the weight (kg) of women swimmers and their heights (inches).

Height	68	64	62	65	66
Weight	132	108	102	115	128

- Develop a scatter diagram for these data with height as the independent variable. (3 marks)
- What does the scatter diagram developed in part (a) indicate about the relationship between the two variables? (3 marks)
- Estimate the relationship between height and weight by drawing a straight line through the data. (3 marks)
- Develop the estimated regression line by computing the values of b_0 and b_1 . (10 marks)
- If a swimmers' weight is 63 inches, what would you estimate her weight to be? (4 marks)

Q2. Two fair dice each have faces labeled 1 to 6 in the normal way. One die has the faces 1 and 2 coloured red, the second has faces 1,2,3 and 4 coloured red, whilst all other faces are white . Calculate the probability of the following events;

- The sum of the scores is even (8marks)
- Both faces are red (8marks)
- Show that these events are independent (7marks)

Q3. The following were scores of Urban and Regional Planning students in two tests, Test A and Test B. Test A is taken as variable X and Test B is taken as variable Y.

Students	Test A (X)	Test B (Y)
Muchoki	5	4
Njeri	6	6
Langat	5	5
Otieno	3	2

Juma	2	3
Osoro	3	4

- Plot a scatter diagram for the above test scores (4marks)
- Compute the Pearson Product Moment Correlation Coefficient r_{xy} between Test A and Test B for this class. Interpret the value of r_{xy} . (7 marks)
- Compute the Spearman Rank Correlation Coefficient, ρ , for this class in the two tests. (7marks)
- Which one of the two correlation coefficients would you prefer for this data? Give reasons for your choice. (5marks)

Q4. The following scores were obtained by seven pupils in tests of English and Mathematics.

English (x)	Mathematics (y)
55	50
40	45
30	40
35	30
20	15
15	20

- What is the slope coefficient, **b**, of predicting Mathematics scores from English scores? (6marks)
- What is the intercept of regression equation, **a**, based on this data? (6marks)
- What is the regression equation for the data? (6marks)
- What would be the predicted Mathematics scores for an English score of 70? (5marks)

Q5. To test for any significant difference in the time between breakdowns for four machines, the following data were obtained.

	Time (hours)					
Machine 1	6.4	7.8	5.3	7.4	8.4	7.3
Machine 2	8.7	7.4	9.4	10.1	9.2	9.8
Machine 3	11.1	10.3	9.7	10.3	9.2	8.8
Machine 4	9.9	12.8	12.1	10.8	11.3	11.5

- a) Develop the ANOVA table for this problem (16marks)
b) At the $\alpha = .05$ level of significance, is there any difference in the mean time between breakdowns among the four machines. (7marks)

Q6. With an intention of purchasing a set of typewriters, an institution loans twenty typewriters, ten of type A and ten of type B, for testing which type to buy. Using ten copy typists, not familiar with any of the two type of machine, the following words per minute were recorded.

Typist	1	2	3	4	5	6	7	8	9	10
Type A	60	45	50	60	70	65	45	50	56	56
Type B	40	50	52	65	60	65	50	45	60	80

Test the null hypothesis that the two types of typewriters are equally good. Advice the institution (23marks)