



MASENO UNIVERSITY
UNIVERSITY EXAMINATIONS 2015/2016

**FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE
DEGREE OF MASTER OF SCIENCE IN ENVIRONMENTAL
SCIENCE**

CITY CAMPUS

NES 828: ENVIRONMENTAL SYSTEMS ANALYSIS

Date: 27th April, 2016

Time: 2.00 - 5.00pm

INSTRUCTIONS:

- Answer ANY FOUR Questions.

1. a) Discuss the strategic environmental assessment as an environmental systems analysis tools. *(8mks)*
b) Compare and contrast environmental impact assessment and strategic environmental assessment. *(7mks)*

2. a) Explain why knowledge of environmental systems analysis is a must to 21st century development goals. *(5mks)*
b) Discuss the characteristics of cost benefit analysis as a tool for environmental systems analysis. *(5mks)*
c) What are the problems in applying cost benefit analysis *(5mks)*

3. A sample of 10 fish of one species is randomly selected from a box on a fishing boat. Each fish is weighed and measured and then dissected to remove the otoliths, which are also measured. The data are tabulated in the Table below

Otolith and fish length measurements

Otolith length x (mm)	Fish mass y(g)
6.6	86
6.9	92
7.3	71
7.5	74
8.2	185
8.3	85
9.1	201
9.2	283
9.4	255
10.2	222

Calculate the product moment correlation coefficient

(15mks)

4. A biologist investigates the effect of applying different amounts of fertilizer on the yield of grass on reclaimed derelict land. Grass seed is sown uniformly over the area. Ten $1m^2$ plots are located randomly and a different mass of commercial fertilizer is applied evenly to each. Two months later the grass is carefully harvested from each plot, dried and weighed. The results of the experiment are tabulated below

x variable:

Mass of fertilizer (g/m^2) 25 50 75 100 125 150 175 200 225 250

y variable:

Yield of grass (g/m^2) 84 80 90 154 148 169 206 244 212 248

Determine the regression equation

(15mks)

5. A biologist wishes to know if the mean masses of starlings sampled in four different roost situations are different. A sample of 10 units (starlings) is obtained from each situation and tabulated below.

Masses of starlings from four roost situations (g)

Situation 1 Sample 1	Situation 2 Sample 2	Situation 3 Sample 3	Situation 4 Sample 4
78	78	79	77
88	78	73	69
87	83	79	75
88	81	75	70
83	78	77	74
82	81	78	83
81	81	80	80
80	82	78	75
80	76	83	76
89	76	84	75

Determine the analysis of variance and tabulate the results

(15mks)

6. Compute the complete probability distribution of all combinations for $k = 8$ when $p = 0.5$.

(15mks)