

**OLLSCOIL NA hÉIREANN, GAILLIMH  
NATIONAL UNIVERSITY OF IRELAND, GALWAY**

**SUMMER EXAMINATIONS 1999/2000**

**MSc Occupational Health & Ergonomics**

**DATA ANALYSIS (IE 521)**

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**Time allowed: 3 hours**

**Answer FIVE questions, ONE at least from Sections A, B and C  
Use separate answer books for each Section**

**SECTION A - COMPUTING**

**Question 1**

You own a small healthcare business which trades internationally. Describe a suitable computer system for your needs including details on the hard and software options.

**Question 2**

- (a)** Explain which type of computer package you would use to create graphical images of data and the processes involved in doing so.
- (b)** Statistical analysis of data can be a complex process. Discuss appropriate software tools, commenting on the different types of analysis possible and how you would perform them using the computer.

**PTO**

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## SECTION B - STATISTICS

### Question 3

Write short notes on **three** of the following:

- a) The importance of determining the quality of your data
- b) The advantages of non-parametric data analysis techniques
- c) The difference between 'relationship' and 'difference' research questions
- d) Why Chi Square is a useful data analysis technique
- e) The difference between correlation and causation

### Question 4

Training officers have identified a need for more participative methodologies to be used in their courses, but felt ill equipped to fulfil those roles. In order to pilot a new system of training them in these methodologies, 9 officers volunteered to participate in a research study of the methods. Each officer was rated on a scale of one to thirty by a single independent observer as to their skills in participation before and after they received specific training in a group.

Before training	After training
12	14
16	24
10	13
12	11
13	14
10	17
15	21
11	15
9	12

- a) Assume that the data achieve the assumptions of parametric analyses, test for the significance of differences before and after training ?
- b) Evaluate your obtained t, using  $\alpha = 0.05$ .
- c) Based your analyses would you recommend that the training course be offered to a wider range of officers ?
- d) What difficulties do you have in interpreting this data ?

### Question 5

Employees in a large catering outlet were asked to volunteer to help develop a healthy eating campaign for staff. Researchers are interested in whether there is an age related bias among those who volunteered.

Age Group	Volunteered	Were not interested
16-25	4	3
26-35	15	4
36-45	20	22

- What would your hypotheses be ?
- What are the main assumptions underlying Chi Square analyses?
- Conduct the appropriate Chi Square analyses to investigate whether these differences across categories are statistically significant.
- Employ an alpha of 0.05, to evaluate your obtained Chi Square.
- What conclusions can you draw from this analysis ?

## SECTION C - EPIDEMIOLOGY

### Question 6

Outline the plan of a randomised controlled trial in a workforce setting. Describe in the context of the trial, the importance of

- Statistical significance
- Power
- Clinical significance

### Question 7

Compare and contrast the advantages and disadvantages of case-control and prospective studies in the work environment. Place particular importance on the role of bias in such studies.

### Question 8

What are the uses of occupational surveillance methods in the workforce? Discuss with focus on the types of study designs used.