

Ollscoil na hÉireann, Gaillimh
National University of Ireland, Galway

GX 2534

Semester I Examinations, 2003/2004

Front Page Template

Exam Code(s)	4BS2, 4BS6, 4BO2
Exam(s)	B.Sc. degree Hons (4BS2, undenominated) B.Sc. degree Hons (4BS6, Medical intercalated) B.Sc. degree Hons (4BO2, Biomedical Science)
Module Code(s)	SI412
Module(s)	Physiology
Paper No.	I
Repeat Paper	
External Examiner(s)	Dr. D. Marples
Internal Examiner(s)	Prof. M.T. Kane, Dr. K. Doyle Dr. A. Hynes, Dr. L. Quinlan
<u>Instructions:</u>	Answer Both Part I and II of Question 1 in Section A Answer Three Questions out of Five in Section B Use a Separate Answer Book for each Section.
Duration	Three hours
No. of Answer books	Two
<u>Requirements:</u>	
Handout	
MCQ	
Statistical Tables	X
Graph Paper	
Log Graph Paper	
Other Material	
No. of Pages	2 (3 including front page template)
Department(s)	Physiology

OLLSCOIL NA hÉIREANN, GAILLIMH
NATIONAL UNIVERSITY OF IRELAND, GALWAY

Semester I, Winter 2003

B.Sc (Hons.) and B.Sc Biomedical Science (Hons.)

PHYSIOLOGY

Paper I

Examiners

Dr D. Marples, Prof. M. Kane, Dr. K. Doyle, Dr. A. Hynes, Dr. L. Quinlan,

Time Allowed 3 hours

Candidates must answer **Both Section A and Section B.**

Please Use a **Separate** Answer Book For **Each Section**

SECTION A (35%)

Q1. Answer Both **Part I** and **Part II**

Part I

You are carrying out an experiment or trial for a drug company, which is trying to develop new drug treatments for patients with high blood cholesterol. The company has 4 new drugs (Drugs A, B, C, and D) which it wishes to compare with the industry standard (Drug X). The company has access to 200 patients with total blood cholesterol levels of greater than 240 mg/dL in each of three centres Dublin, Cork and Belfast (600 patients in all). You set up the experiment so that each of the five drug treatments is applied at random to patients in each of the three centres. You examine the response of the patients after about two weeks of their new treatment and you use as your response the average of three total blood cholesterol levels taken on three successive days. Statistically what kind of experimental design is this?

Based on the following data, set up the analysis of variance table, calculate the F-ratio and using statistical tables, answer the question “is there a significant effect of drug treatments?”

Corrected total sum of squares = 200,000

Sum of squares due to drug treatments = 70,000

Sum of squares due to centres = 50,000

Sum of squares due to drug treatment x centres interaction = 1,500

If the drug x centre interaction had been significant, what difference would that have made to your analysis? Explain your answer. Note there is room for more than one view on this for this particular experiment but you must state your reasons for the view you take. What post hoc test would you use in this experiment? Give reasons for your answer. Have you any comments on the wisdom of restricting the evaluation of the response to the drug treatments to "the average of three total blood cholesterol levels taken on three successive days"? You can be as critical as you like in your answer if you can justify your criticisms.

- Part II** **Write short notes on two of the following**
- (a) The importance of controls in scientific research
 - (b) Experimental and null hypotheses
 - (c) Experimental Designs

SECTION B (65%) Answer Three Questions out of Five

- Q2** Describe the formation of a nerve action potential and outline the conduction of a nerve impulse along a myelinated neuron compared to an unmyelinated neuron
- Q3.** In relation to the kidneys what is the GFR and how is it maintained under normal condition.
- Q4** Discuss the endocrine role of the adrenal glands
- Q5** Write an essay on the control of respiration
- Q6** Write an essay on the role of the cerebellum in movement