

OLLSCOIL NA hÉIREANN, GAILLIMH  
NATIONAL UNIVERSITY OF IRELAND, GALWAY

**2nd Science and 2nd Biomedical Science Examination Semester 1  
1999**

**PHYSIOLOGY**

Examiners: Prof. J.V. McLoughlin, Prof. M.T. Kane, Dr. D. Colbert, Dr. A. Hynes,  
Dr. L. Quinlan

Time Allowed: **Two** hours. Please use a separate book for each question. Answer all three questions

1. (40%) Write short (NOT more than about a page in length) **concise relevant** notes on **four** of the following:

- (a) Draw and label a diagram of the action potential in nerve. How does conduction occur in a myelinated nerve?
- (b) Describe with diagrams the process of cross bridge cycling during contraction of skeletal muscle filaments.
- (c) Give a brief description of the various transport processes by which ions and other substances are moved in and out of cells.
- (d) Give an account of the various body fluid compartments with a rough indication of their ionic composition.
- (e) transmission at a neuromuscular junction
- (f) the Henderson-Hasselbalch equation and its importance in pH control.
- (g) the generator potential

2. (30%) List the chief functions of the plasma proteins. Explain in detail the importance of their osmotic pressure ("oncotic pressure").

OR

Write short notes not exceeding half a page in length on *three* of the following:

- (a) the packed cell volume (PCV)
- (b) the importance of tissue factor (TF)
- (c) anticlotting agents in blood
- (d) the production of Rhesus disease (a diagram is essential).

3. (30%) Discuss the role of the endocrine pancreas in glucose metabolism

OR

Write short notes on three of the following

- (a) the functions of aldosterone
- (b) the production of sperm (spermatogenesis)
- (c) the role of antibodies in the immune system
- (d) non-specific mechanisms of defense.