

**NATIONAL UNIVERSITY OF IRELAND, GALWAY**  
**Ollscoil na hÉireann, Gaillimh**

Summer Examinations, 2000 - Honours  
B.Sc. Degree and M.Sc. Qualifying Examinations  
**BIOCHEMISTRY (BI401)**  
*First Paper*

Extern Examiner: Professor N.C. Price

Time allowed: *Three Hours*

Write on **three** of the following topics, choosing at least one from each section.

Please start each answer with a new answer book and clearly indicate the number on the front.

**Section A**

1. Despite considerable problems crystallographers are today obtaining atomic resolution structural information on large molecular weight proteins. Describe, (a) the levels of structural information that X-ray crystallography can provide, (b) the problems that must be overcome to obtain high-resolution information, and (c) the methods used to overcome these obstacles.
2. Outline the important considerations in selecting an expression system for glycosylated proteins.
3. Give a detailed account of the structure and dynamic assembly of actin filaments. Outline the role of actin and its associated motor protein in cellular vesicle movement.

**P.T.O.**

## **Section B**

4. Outline the structure and discuss the functions of membrane phospholipids.
5. "Lectins are important carbohydrate-binding proteins" Discuss lectins with reference to structure, biochemical functions and biomedical applications.
6. Discuss the serine proteases with respect to their mechanism of action and their evolutionary relationships.