

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

Autumn Examinations, 2002 - Honours

B.Sc. Degree Examination

BIOCHEMISTRY (BI401)*Third Paper*

Extern Examiner: Dr. D.K. Apps

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. 'The quality of X-ray diffraction data obtained from protein crystals varies considerably'. Discuss this statement paying particular attention to; (i) how low quality data is recognised, (ii) the factors that influence data quality, (iii) how data quality can be improved, and (iv) the impact of data quality on the structural information that can be obtained.

2. Oligomannose and complex N-glycans are present on the important therapeutic protein, tissue plasminogen activator (tPA). Describe the types of protein expression systems/hosts you would select for production of recombinant tPA, giving reasons for your choice(s), and outline the strategy you would use to characterise the N-glycan structures on your glycoprotein product.

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3. Discuss strategies for location and treatment of cancer which exploit the interaction of peptides with their cell surface receptors .

Section B

4. Outline the principles and describe biochemical applications of mass spectrometry.
5. Write on recent developments in NMR spectroscopy of particular relevance to biochemical research.
6. Discuss the applications of radioisotopes in biochemical research..