

National University of Ireland, Galway
Ollscoil na hÉireann, Gaillimh

SUMMER EXAMINATIONS 2002 HONOURS

Denominated Degree in Biotechnology (4BY 221)

BIOTECHNOLOGY (BG 401)

Second Paper

External Examiner: Dr. D.K. Apps

Time Allowed: Three hours

Write on *three* of the following topics, choosing at least *one* from each section.
Start each answer in a new answer book and write the number on the front.

SECTION A

1. Write an essay on oxygen supply to industrial bioprocesses, the importance of efficient aeration and how it is achieved.
2. What does the term “volumetric productivity” mean? What steps might you take to maximise the volumetric productivity of a batch culture?
3. Discuss approaches to the sterilization of media and fermenters used for large scale industrial bioprocesses.

SECTION B

4. Discuss the role of DNA repair in genome maintenance in eukaryotic cells.
5. Discuss the G1/S DNA damage checkpoint with reference to its biological organisation and relevance to cancer.
6. Discuss the process of transcriptional regulation in eukaryotic cells, with reference to transcription factors, chromatin structure and coactivators.
7. *Drosophila* is an excellent model species for developmental biology. Describe the role of transcription factors in (a) establishing the antero-posterior axis and (b) segmentation along this axis in the *Drosophila* embryo.