

OLLSCOIL NA hÉIREANN, GAILLIMH

SEMESTER II EXAMINATIONS 2000

4th year Environmental Science B.Sc. Hons

Environmental Microbiology and Waste Management

EXTERN EXAMINER: Professor B. Wood

INTERN EXAMINER: Professor E. Colleran

TIME ALLOWED: 3 HOURS

ANSWER ANY THREE QUESTIONS

(Indicate clearly the questions answered on the first page of your answer book)

- Q1** "Landspreading would appear to offer the most environmentally acceptable means of re-use/recycle of agricultural wastes." Comment critically on this statement in the context of the variety and quantity of agricultural waste arisings generated in Ireland.
- Q2** A group of cattle farmers, piggery owners and poultry plant managers are interested in setting up a Centralised Anaerobic Digestion (CAD) plant in Co. Monaghan, but know very little about CAD and its application. How would you explain the technology to them, while commenting critically on its advantages, disadvantages and potential operational problems in an Irish context?
- Q3** The Waste Management Strategy for Dublin proposes to compost the source-separated putrescible fraction of Municipal Solid Waste (MSW). Discuss the composting process and its application to the organic fraction of MSW. Comment critically on its advantages and disadvantages and on the problems likely to be encountered by Dublin Corporation in implementing this overall strategy.
- Q4** Waste to Energy Combustion Plants (Incineration) are being proposed by many local and regional authorities as the solution to the waste management crisis in Ireland. Discuss the advantages, disadvantages and potential problems associated with the adoption of this technology in Ireland.

OR

"Landfill, at a larger scale and with careful siting and high standards of operation, will continue to be the preferred option for MSW management in Ireland." Critically discuss this statement with particular reference to leachate and landfill gas management. In your opinion, is landfill an acceptable option for MSW management in Ireland?

- Q5** Compare and contrast the application of *in situ* and *ex-situ* bacterial bioremediation processes for the removal of organic pollutants from contaminated soils and sediments.

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Q6 Describe the direct and indirect processes involved in the bioleaching of metals from orebodies. Discuss the current application of these processes for the biomining of copper and for the enhanced recovery of gold.