

OLLSCOIL NA hÉIREANN, GAILLIMH

SEMESTER 1 EXAMINATIONS 1999

3rd year Environmental Science B.Sc.

Environmental Microbiology

EXTERN EXAMINER: Professor B. Wood

INTERN EXAMINER: Professor E. Colleran

TIME ALLOWED: 2 HOURS

ANSWER ANY THREE QUESTIONS

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

- Q1** Discuss the nature of the Gram (-) cell envelope and its associated extracellular structures (pili, flagellae, etc.).
- Q2** List the factors that determine microbial growth in the biosphere and describe any two of these in detail.
- Q3** Discuss the role of high-energy compounds, such as ATP, in microbial metabolism.
- Q4** (a) Describe the effect of temperature and pH on enzyme catalysis rates.
(b) Distinguish between competitive and non-competitive inhibition of enzyme activity, illustrating your answer by examples.
- Q5** Discuss the mechanisms used by bacterial cells for glucose uptake and briefly describe the subsequent operation of the glycolysis pathway, focussing mainly on the mechanisms of ATP generation.
- Q6** Describe the main characteristics of a bacterial fermentation pathway. Illustrate the post-glycolysis steps operative during alcoholic fermentation and during the mixed acid fermentation.
- Q7** Describe the operation of the electron transport chain in eucaryotic organisms.