

OLLSCOIL NA hÉIREANN, GAILLIMH**SUMMER EXAMINATIONS 1998**

Denominated B.Sc.Degree in Marine Science, Third Year.

Marine Microbiology MR306

EXTERNAL EXAMINER Prof. J.Smith

INTERNAL EXAMINER Internal Examiners

TIME ALLOWED: **3 hours.**

ANSWER FIVE QUESTIONS

1. Describe the annual cycle of phytoplankton growth and activity in temperate seas.
2. What do you understand by the term "Cell Quota" of nutrients ?
How does the cell quota affect phytoplankton growth..
3. **Either**
 - a) Outline variations in phytoplankton biomass and community found in shelf waters around Ireland in summer.

Or

 - b) Describe the seasonal changes in phytoplankton communities that are observed in a temperate shelf sea through the year.
4. How does the quantity and quality of irradiance vary with depth in the sea.
5. Write notes on **three** of the following:
 - a) Harmful phytoplankton and harmful algal blooms
 - b) Uptake of nutrients by phytoplankton.
 - c) The fate of bacterioplankton
 - d) Bacteria in the deep ocean..
- 6) Write an essay on sources of nutrition for heterotrophic bacteria in the surface waters of the ocean.
- 7) Discuss the use of radioactive isotopes for the study of microbial activity.
- 8) Write an essay on indigenous marine viruses.
- 9) What kind of microbially mediated processes would you expect to find in the benthos in inshore areas? How do they interact with the sediment environment?