

OLLSCOIL NA hÉIREANN
NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER I EXAMINATIONS, 2005

Fourth Year (Denominated B.Sc. Degree in Marine Science; Honours)

MR 401: Advanced Topics Paper II

Prof. M.J. Dring
and the internal examiners

Time allowed: *Three hours.*
 Answer *FOUR* questions, at least **ONE** from each section.

Use a **SEPARATE** answer book for each section

SECTION A

1. Answer both parts

a) Outline the process of mode water formation in the sub polar gyre of the N Atlantic. Explain what factors influence the resultant properties of Labrador Sea Water leaving the sub polar gyre at depth.

b) Briefly describe the difference in the following processes occurring in the N. Atlantic under conditions of high and low North Atlantic Oscillation (NAO)

- i) Precipitation/Evaporation,
- ii) Wind patterns,

Briefly describe the resultant effect on Labrador Sea Water formation under high and Low NAO conditions

2. Answer both parts

a) Describe the formation process of potentially retentive circulation patterns due to i) tidal mixing fronts and ii) dynamic processes acting at submerged banks/seamounts.

b) Describe the processes acting at submerged banks and seamounts that may generate enhanced chlorophyll concentrations over those features.

3. There have been episodes of both serious reductions, and increases, in many commercial fish stocks. Such fluctuations has been attributed to environmental anomalies. Explain and give examples of these anomalies.

continued

SECTION B

4. Discuss the application of molecular methods to the study of marine microbial ecology and their advantages and disadvantages.
5. What is symbiosis? Describe a symbiotic relationship which occurs in the marine environment. What are the roles of each partner?
6. Write an essay on the problems of infectious disease in mariculture and its control

SECTION C

7. Discuss whether micro-organisms or macro-organisms are the most diverse component of the marine ecosystem.
8. Outline the main physical oceanographic features that can be found in the shelf seas off Ireland in summer which impact on phytoplankton ecology. Outline in your answer the way in which these features control phytoplankton distributions.
9. Write an essay on the phytoplankton ecology of the Irish Sea.