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OLLSCOIL NA hÉIREANN

NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER I EXAMINATIONS, 2002

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

MR 401: Advanced Topics Paper 1

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. Write an essay about ocean models. Give examples of their use.

2. How may diffusion coefficients be estimated in the coastal ocean? How and why do they vary with scale?
Estimate the vertical mixing coefficient in a well mixed channel of depth 5 m for a flow speed of 2 m s^{-1}.

3. **a.** Estimate the peak tidal flow in a bay of uniform width, with a uniform depth of 20 m and length 30 km:
i. at the mouth of the Bay.
ii. 10 km from the head of the Bay.
If the bay was not uniformly wide, how would it affect your answer?

AND

b. In an estuary, the surface salinity is 33 and the salinity at depth is 34. If the surface layer is 2 m thick, and the total depth is 10 m, how fast must the current speed be for the layers to mix?

P.T.O.

SECTION B

4. How useful are marine algae as (direct or indirect) indicator species for water pollution? Describe the characteristics required for such species.

5. Discuss the implications of seaweed morphology for photosynthesis, growth and survival: how relevant is the form-function model of Littler?

6. Describe the typical physiological responses of marine algae to light stress, including adaptations/acclimations to both high and low irradiances.

SECTION C

7. Write an account of the life history strategies of fish in the context of fishery potential and comment on the response of some commercial species of fish to exploitation.

8. Write a critical appreciation of the phenomenon of ***hypoxia*** in the sea.

9. Describe and discuss the effects of deposit feeding invertebrates on the sedimentary environment.