THE UNIVERSITY *of York*

Degree Examination 2004

ENVIRONMENT DEPARTMENT

BSc in Environment, Economics and Ecology, Part 1b

ECONOMICS OF ENVIRONMENTAL POLICY

Time allowed: **one and a half hours**

Instructions: Answer **ANY THREE** questions.
All questions are equally weighted. Answer all parts of the questions.

University calculators will be provided

*Pay adequate attention to spelling, punctuation and grammar, so that your
answers can be readily understood*

1   Consider an external effect relating production in two quite different
        industries.

(a)   Suppose that the level of output in one industry positively affects the level of
        output in a second industry, but is itself unaffected by the level of output in
        the second industry. Describe the nature of the externality. Model this
        problem and identify the marginal external benefit of production in the first
        industry. (10 marks)

(b)   What level of subsidy should be imposed in order to induce a socially efficient
        level of output in the industry that is the source of the externality? (5 marks)

(c)   What are the disadvantages of using subsidies as a way of internalising
        environmental externalities? (5 marks)

2.   Evaluate the arguments for the use of market based instruments versus
        'command and control' measures in the management of environmental
        externalities under conditions of (a) certainty and (b) uncertainty. Illustrate
        your answer with examples. (20 marks)

3.   There are two groups in a community whose demands for the provision of an
        environmental amenity are:

        $y_1 = 100 - p$

        and

        $y_2 = 200 - p$

        where p is the 'price' of the amenity.

(a)   Suppose that the amenity is a pure public good. You can think of it as a
        nature reserve. Once produced, everyone benefits. What would be the optimal
        size of the nature reserve if it could be maintained at a constant marginal cost
        of £120 per hectare? (6 marks)

(b)   If provision of the nature reserve were left to the private market, what would
        its size be? (6 marks)

(c)   If the environmental authority were to establish the reserve at the optimal size,
        how much would it cost? How should the tax bill for this amount be allocated
        between the groups if they are to share it in proportion to benefits received?
        Would you expect both groups to reveal their preferences in this case? (8
        marks)

4.   Consider the problem of BOD pollution in the River Ouse. Tradable permits
        are currently being recommended as a solution to pollution problems of this
        sort.

(a)   What are the conditions in which tradable permits may be expected to work? Be sure to consider both aspects of the system (i.e. the physical restriction on emissions and the tradability of permits). (5 marks)

(b)   How does a system of tradable permits meet an emissions target cost-effectively? What are the distributional implications of any allocation of permits other than simple 'grandfathering' (10 marks)

(c)   Would a system of tradable permits work in the case of BOD emissions to the Ouse? Justify your answer. (5 marks).

5.   Consider the problem of 'acid rain' in Europe.

(a)   Discuss the difficulties posed by transboundary externalities in general, and indicate which of these pose special problems in the case of acid rain in Europe. (10 marks)

(b)   Sandler has argued that the reductions in SO_2 emissions agreed by parties to the Long Range Transboundary Pollution Agreement are no greater than they would have undertaken in the absence of a formal treaty. Explain and assess his argument. (10 marks)