

# UNIVERSITY OF YORK

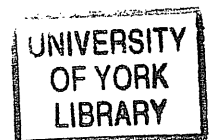
**Examination 2005**

## ENVIRONMENT DEPARTMENT

BSc in Environmental Economics and Environmental Management, Part 1b  
Diploma in Environmental Economics and Environmental Management

### ECONOMICS OF ENVIRONMENTAL POLICY

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



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*

### Question 1

Suppose that emissions generated by one industry have a negative effect on the output of a second industry. The first industry is not in any way affected by the second industry.

- (a) Describe the nature of the externality. Model this problem and identify the marginal external cost of production in the first industry. (10 marks)
- (b) Now suppose that the first industry has the option to abate emissions. Using your model, show the privately optimal level of abatement. What level of tax should be imposed in order to induce a socially efficient level of output in that industry? Explain how the tax should be applied. (10 marks)

### Question 2

Suppose that there are 300 households affected by a local source of pollution, and that each household's willingness to pay curve for a unit improvement in air quality is given by the equation

$$p(x) = 100 - 10x$$

Suppose also that a unit improvement in air quality costs £9,000.

- a) What is the social marginal willingness to pay curve for units of improvement in air quality, and what is the socially optimal level of improvement in air quality? (10 marks)
- b) Does the Coase theorem suggest a practical policy solution to this particular problem? Comments on the strengths and weaknesses of the Coase solution generally. (15 marks)

### Question 3

It is often argued that 'market based instruments' are a more efficient way of regulating environmental effects than 'command and control' instruments.

- (a) Review this argument and the evidence brought forward to support it (10 marks)
- (b) Suppose that there is uncertainty about the net private benefit of an activity with external environmental effects. Suppose also that the environment agency's options to deal with this are a flat rate tax and a standard supported by fines for non-compliance. Explain the circumstances in which the standard would be a better option than the tax. (10 marks)

#### Question 4

Many environmental problems arise because people behave in a way that leads to a socially sub-optimal outcome. The 'prisoners dilemma' is a good example of this. The same is true of behaviour between countries. Consider the following examples and then answer the questions that follow:

(a)

		Country B	
		Dont Pollute	Pollute
Country A	Dont Pollute	1, 2	0, 1
	Pollute	2, 1	1, 0

(b)

		Country B	
		Dont Pollute	Pollute
Country A	Dont Pollute	2, 1	0, 0
	Pollute	0, 0	1, 2

(c)

		Country B	
		Dont Pollute	Pollute
Country A	Dont Pollute	0, 0	0, -1
	Pollute	1, 0	-1, 3

(c)

		Country B	
		Dont Pollute	Pollute
Country	Dont Pollute	-1, -1	-6, 0
	Pollute	0, -6	-3, -3

Taking the position of both parties in turn, explain the decisions of each given the decisions of the other. Characterise the equilibrium outcomes, and explain the implications they have for environmental policy. Give examples of real environmental problems in each case (25 marks)

### Question 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.
- b. Sandler has argued that the reductions in SO<sub>2</sub> 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.