

**Ollscoil na hÉireann, Gaillimh**  
*National University of Ireland, Galway*

**Semester II Examinations, 2004/2005**

Exam Code(s)	2BA5
Exam(s)	2 <sup>nd</sup> BA (Economic and Social Studies)
Module Code(s)	EC226
Module(s)	Cost-Benefit Analysis
Paper No.	1
Repeat Paper	Special Paper
External Examiner(s)	Professor Vincent Munley
Internal Examiner(s)	Mr. Brendan Kennelly
	Ms. Breda Lally

**Instructions:**

**Section A:** Answer **all** multiple choice questions  
 (worth 60 marks)

**Section B:** Answer **two** questions (worth 40 marks each)

**Section C:** Answer **one** question (worth 60 marks)

Duration	2hrs
No. of Answer books	3

**Requirements:**

Handout	
MCQ	
Statistical Tables	
Graph Paper	
Log Graph Paper	
Other Material	

No. of Pages	5 Including cover sheet
Department(s)	Economics

5. If all four projects are independent which project(s) should be adopted according to the cost benefit rule?
  - (a) A
  - (b) A and D
  - (c) A, C and D
  - (d) A, B and D
  - (e) All four projects
6. If all four projects are mutually exclusive which project(s) should be adopted according to the cost benefit rule?
  - (a) A
  - (b) A and B
  - (c) A, C and D
  - (d) A, B and C
  - (e) none of the four projects
7. According to the benefit-cost ratio which of the four projects should not be adopted?
  - (a) A
  - (b) B
  - (c) C
  - (d) D
  - (e) all four projects
8. Willingness to pay
  - (a) is always positive
  - (b) is always negative
  - (c) can be positive or negative
  - (d) measures opportunity cost
9. A natural monopoly
  - (a) has high fixed costs relative to its variable costs
  - (b) has a downward sloping average cost curve
  - (c) with no government regulation results in a deadweight loss to society
  - (d) all of the above
10. What is the present value of ₦121 two years from now at a discount rate of 10%?
  - (a) 100
  - (b) 110
  - (c) 112
  - (d) 120

## Section B

### Answer TWO questions

#### Question 1 (40 marks)

The government has recently introduced a Pigouvian tax to deal with the problem of waste emissions from polluting industries. Industry X is affected by this tax and is considering investing in new technology to reduce its emissions. Consultants have estimated that investing in the new technology at a cost of €275,000 would reduce the industry's tax bill by €50,000 each year. They estimate that the new technology would also provide yearly benefits of avoided waste disposal costs of €20,000 each year. The new technology has a useful life of five years after which it has a salvage value equal to 5% of its initial cost. In its investment decisions, the firm uses a nominal discount rate of 6%.

Should the industry undertake the investment if the benefits of the new technology occur

- (a) at the end of the year?
- (b) throughout the year?

#### Question 2 (40 marks)

Suppose the demand a product produced by an exporting firm based in Sligo is known to be  $Q = 400 - P$  and the supply curve is  $P = 200 + Q$ . Now suppose that the government upgrades the N4, the main road between Sligo and Dublin, which reduces the amount of time it takes the supplier to get his goods to Dublin Port. This reduction in delivery time reduces the firm's transportation costs by €30 per unit of output. Find:

- (a) the initial equilibrium price and quantity
- (b) the new equilibrium price and quantity
- (c) the gross social benefit
- (d) Now suppose that instead of upgrading the N4, the government gives the firm a subsidy of €30 per unit of output produced. What is the gross social benefit of this government policy?

#### Question 3 (40 marks)

Suppose the demand curve for concrete is known to be  $Q = 600 - 4P$  and the supply curve is  $Q = -800 + 10P$ . Now suppose the government decides to build a new road, which increases the demand for concrete by 140 tons. Find:

- (a) the initial equilibrium price and quantity
- (b) the new equilibrium price and quantity
- (c) the net social cost of the government purchase of concrete

## Section C

### Answer ONE question

#### Question 1 (60 marks)

- (a) A monopoly and information asymmetry are two examples of market failure. Illustrate and explain how each of them results in a deadweight loss.
- (b) In the case of information asymmetry should the government provide the missing information? Explain.
- (c) If the government does provide the missing information what impact will this have on producers and producer surplus?
- (d) Outline and explain what government action can be taken to remedy or correct the market failure arising from a monopoly. Illustrate and explain the impact this action will have on consumer surplus, producer surplus, social surplus and deadweight loss.

#### Question 2 (60 marks)

- (a) A Sligo based monopolist producing road signs has a demand curve given by  $P = 100 - Q$  and a total cost curve given by  $TC = 16 + Q^2$ . The associated marginal cost curve is  $MC = 2Q$ .
  - (i) Find the monopolist's profit maximizing quantity and price.
  - (ii) How much economic profit will the monopolist earn?
- (b) Now suppose the government decides to upgrade **twenty** road signs in County Sligo and buys these signs from the monopolist.
  - (i) Find the new profit maximizing quantity and price.
  - (ii) How much economic profit will the monopolist now earn?
  - (iii) What is the net social cost of the government purchase?

#### Question 3 (60 marks)

Suppose the demand for labour is known to be  $Q = 400 - P$  and the supply curve is  $Q = 50 + 4P$ .  $Q$  is the number of workers and  $P$  is the daily wage rate.

- (a) What is the equilibrium wage rate and quantity of labour employed?
- (b) Now suppose the government introduces a minimum wage rate of €10 per hour. Assuming workers work eight hours a day what are the employment and unemployment levels at this wage rate?
- (c) Now suppose the government decides to hire 10 of these unemployed workers at the minimum wage. Outline, explain and estimate the five different ways of estimating the social cost of hiring these workers.