Answer all 4 questions. Weights given next to each question.

Question 1 (25%)

a. Explain how externalities are caused by a lack of property rights, provide examples.

b. Demonstrate the effect of a negative production externality (e.g. pollution) on economic welfare.

c. Illustrate and discuss how assigning property rights can, in principle, solve problems related to negative production externalities.

Question 2 (25%)

a. What is the societally optimal level of pollution? Why is this not usually zero?

b. Using appropriate diagrams show how a reduction in pollution should be optimally shared across two firms with different abatement costs.

c. Demonstrate how an emissions trading system (cap and trade) can lead to cost minimizing pollution abatement. Does it matter how the allowances are initially allocated?

Question 3 (25%)

Consider a depletable resource stock of Q=25 to be allocated across two periods.

The marginal willingness to pay (demand curve) is given by $P=20-0.8Q$

Where P is the price and Q is the amount extracted.

The demand curve is identical in both periods

The marginal cost is constant and equal to 5

a. Use a discount rate of 0.10 to determine the extraction amount that maximises the present value across both periods. Illustrate and explain graphically.

b. What is the market price and marginal user cost in both periods?

c. Is this allocation fair? What could be done to make the allocation fairer?

Question 4 (25%)

a. Why does the presence of a renewable alternative lead to more rapid extraction and use of a depletable resource?

b. Why would oil producing countries form cartels and attempt to operate as if they are a monopoly? What affects whether these cartels are stable?

c. Should we put an economic value on the environment? What is the difference between stated and revealed preference approaches to valuation?