

AAE / ECON / Forest 531 (Natural Resource Economics)

Final Exam. Wednesday, December 19, 2007

Please answer the following four questions, worth a total of 30 points. Questions 1 and 2 are worth 10 points each; questions 3 and 4 are worth 5 points each. Good luck.

1. **Mathematics / Derivation (10 points):** Consider how a competitive market will allocate a fixed non-renewable resource over time. Suppose demand for the resource is given by $p=25-(1/2)q$, where p is price and q is quantity. Further, suppose no marginal extraction costs, the discount rate is 5%, and the total resource stock is 7 units. Derive the market allocation of this resource (i.e. price and quantity in each time period) and show how the sustainability criterion of fairness across time periods could be satisfied with this allocation. State your assumptions.

2. **Essay (10 points).** The general concept of open access has been used as an economic explanation for (a) the inefficiency of groundwater extraction, and (b) the historical collapse of the society on Easter Island. Carefully present the economic argument for the relevance of open access to these two resource management cases.

