

Department of Economics

## Examination paper for SØK1101

### Environmental and Resource Economics

**Academic contact during examination: Anders Skonhoft****Phone: 73 59 19 39****Examination date:** 31.05.2017**Examination time (from-to):** 4 hours (09.00 -13.00)**Censorship date:** 23.06.2017**Permitted examination support material:** C /Flg formelsamling: Knut Sydsæter, Arne Strøm og Peter Berck (2006): Matematisk formelsamling for økonomer, 4utg. Gyldendal akademiske. Knut Sydsæter, Arne Strøm, og Peter Berck (2005): Economists' mathematical manual, Berlin.

Calculator: Casio fx-82ES PLUS, Casio fx-82EX Citizen SR-270x, SR-270X College or HP 30S.

**Language:** English**Number of pages (front page excluded):** 1**Number of pages enclosed:** 0**Informasjon om trykking av eksamensoppgave****Originalen er:****1-sidig**  **2-sidig** **sort/hvit**  **farger** **skal ha flervalgskjema** **Checked by:**

Date

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Question 1 (50%)

- a) What is your understanding of negative external effects?
- b) Discuss and analyze how the Government ('The Environmental Protecting Agency') may regulate a pollution problem. What is the meaning of an optimal degree of pollution?
- c) Discuss different value categories related to environmental and natural resource goods. How may these different values be measured?
- d) Discuss briefly arguments for and against subsidizing electric vehicles (EV's).
- e) What are the main differences between renewable and nonrenewable resources?
- f) Discuss the conceptual differences between a flow pollution and stock pollution problem.  
Why is the climate problem a stock pollution problem?
- g) Discuss how costs and benefits can be compared across time.

Question 2 (50%)

$dX / dt = F(X) - h$  describes the growth of a fish population.

- a) Explain the natural growth function  $F(X)$ . What will be the size of the fish stock in the long term if harvest  $h$  is zero? What will happen if harvest is fixed through time as  $h = \bar{h}$ ?
- b) Now consider the equilibrium fishery  $F(X) = h$ . Assume that the harvest function is given as  $h = qEX$ . Explain this harvest function and draw a graph illustrating natural growth and harvesting in this equilibrium. How does effort  $E$  influence equilibrium harvest,  $h = h(E)$ ?
- c) Assume that the equilibrium profit of this fishery equals  $\pi = ph(E) - cE$  where  $p$  is the landing price of the fish and  $c$  is the unit effort cost. Find the effort, and also the size of the fish stock, that maximizes the equilibrium profit. Will the stock be above that of the maximum sustainable stock,  $X^{msy}$ ?
- d) Illustrate also the 'open-access' solution of this fishery.
- e) Finally, discuss briefly possible ways to deal with the 'open-access' problem.