



## YLIOPISTOTENTTILOMAKEPOHJA / UNIVERSITY EXAM TEMPLATE

Koskee tiedekuntia LuTK, OyKKK, KaTK, TTK, TST ja BMTK (Linnanmaan tentit) /  
Concerns Faculties SCI, OBS, OMS, TECH, ITEE and BMM (Linnanmaa campus)

Tentin päivämäärä / Date of exam: 18.4.2016	Tentin kesto tunteina / Exam in hours: 4h
Tiedekunta / Faculty: Oulun yliopiston kauppakorkeakoulu / Oulu Business School	
Opintojakson koodi, nimi ja tentin numero / The code and the name of the course and number of the exam: 721334S, Environmental Economics, Final Exam	
Tentaattori(t) / Examiner(s): Enni Ruokamo, Artti Juutinen	Sisäinen postios. / Internal address 6 OyKKK
Sallitut apuvälineet / The devices allowed in the exam:	
<input checked="" type="checkbox"/> Nelilaskin / Standard calculator	<input checked="" type="checkbox"/> Funktiolaskin / Scientific calculator
<input type="checkbox"/> Muu materiaali, tarkennettu alla / Other material, specified below:	<input type="checkbox"/> Ohjelmoitava laskin / Programmable calculator
Tenttiin vastaaminen / Please answer the questions:	
<input checked="" type="checkbox"/> Suomeksi / in Finnish	<input checked="" type="checkbox"/> Englanniksi / in English
Kysymyspaperi on palautettava / Paper with exam questions must be returned:	
<input checked="" type="checkbox"/> Kyllä / Yes	<input type="checkbox"/> Ei / No

### Exam instructions (in English):

*This exam has 5 main exam questions. Answer to all 5 questions.*

*Note that all 5 questions should be answered to separate answer sheets and you should not use more than one answer sheet (i.e. concept paper) for each main question (one answer sheet/one main question).*

*Same in Finnish*

### Tenttiohjeet:

*Tässä kokeessa on viisi pääkysymystä. Vastaa jokaiseen viiteen pääkysymykseen.*

*Kirjoita jokaisen pääkysymyksen vastaus omalle koepaperilleen. Vastaustila on rajoitettu kunkin pääkysymyksen kohdalla yhteen koepaperiin (yksi konsepti/pääkysymys).*

1. Answer the questions below.
  - a. What functions the natural environment provides to the economy? What possibilities of substitutions there are between human-made capital and environmental functions? Give examples. (2 p.)
  - b. What is the materials balance principle? (2 p.)
  - c. What is the environmental Kuznets curve (EKC) hypothesis? (Hint: use graphs) (2 p.)
  
2. Consider the following questions relating to pollution control. Verify your answers briefly. Also explain the underlined terms.
  - a. Identify the efficient level of flow pollutant with a graph and explain the intuition behind it. (2 p.)
  - b. What is the least cost theorem of pollution control and what does it imply? (2 p.)
  - c. When you compare emissions taxes and marketable emission permits when abatement costs are uncertain, what can you say about the dependability of these two instruments? (2 p.)
  
3. Answer the following questions concerning environmental valuation.
  - a. Total economic value of an environmental good can be divided to a number of elements. Explain this categorization. (2 p.)
  - b. Environmental valuation utilizes stated preference methods and revealed preference methods to value environmental goods. Explain the difference between the stated and revealed preference techniques. (2 p.)
  - c. List two stated preference methods and two revealed preference methods. (1 p.)
  - d. What do we mean by hypothetical bias and which environmental valuation method(s) may suffer from this? (1 p.)
  
4. Answer the questions below regarding the Faustmann model.
  - a. Explain the economic problem of forest management by using the Faustmann model. Hint:  $\pi = [pS(t)e^{-it} - k] [1 - e^{-it}]^{-1}$  (2 p.)
  - b. Derive (i.e. differentiate) the criterion for an efficient forest management and felling programme (the Faustmann rule) and interpret the result. (3 p.)
  - c. What are the pros and cons of the Faustmann model? (1 p.)
  
5. Answer the questions below. (Hint: use graphs)
  - a. Describe and explain the pattern of biological growth of a fish stock. (2 p.)
  - b. Describe the open access and private-property (steady-state) equilibriums in fishery and interpret the results. (4 p.)