

## Part I - Udalov

### Question 1 (6 Points)

- (3 Points) Define a negative external effect. What are the implications of negative externalities?
- (3 Points) What are the most important properties of a public good? Compare public good with a private good and explain shortly why is governmental activity required.

### Question 2 (16 Points)

Two firms are situated on a river: cement producer and fishery. The more pollution the cement producer creates, the less is the expected catch of the fishery.

The corresponding profit functions corresponds to

$$\pi_{cement} = 80E - E^2$$

$$\pi_{fish} = 300 - E^2$$

Whereby  $E$  is the emission level created by the cement producer.

- (5 Points) Calculate the emission level of the cement producer in the private equilibrium.
- (5 Points) Calculate the emission level of the cement producer in the social equilibrium.
- (6 Points) The corresponding firms can negotiate about the emission level. The laissez-faire principle is assumed. Calculate maximum compensation the fisher would pay and minimum compensation the factory would accept.

### Question 3 (6 Points)

Name three standard-orientated environmental instruments and evaluate them using ecological accuracy, cost efficiency and dynamic incentive effects.

## Part II - Wilts

### Question 1 (7 Points)

Which analytical dimensions enable to structure "natural resources" into different categories?

### Question 2 (8 Points)

Explain the concept of "double decoupling" and its different elements.

### Question 3 (15 Points)

What criteria need to be taken into account for resource efficiency policy mixes? Please use the example of a specific market-based instrument.

### **Part III - Erdem**

#### **Question 1 (18 Points)**

Please answer the following questions.

- a) (3 Points) Please describe shortly 3 specifics setting energy markets apart from regular markets.
- b) (5 Points) Please list 5 components of energy prices.
- c) (6 Points) Please explain the effects of renewable resources on the price setting in a merit-order based electricity market.
- d) (4 Points) Which segment of German electricity and gas markets is regulated? Please explain the reasoning and objectives.

#### **Question 2 (12 Points)**

Please explain 3 out of 4 concepts you choose: (4 Points each)

- Carbon lock-in effect
- Ecological Kuznet's curve
- Effects of a back-stop technology on the price of exhaustible energy resources
- Hotelling rule