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**Economics IV/Economic Policy (5026)
Final Exam
Retake, February 2010**

Solve the 3 problems below. Each problem is worth up to 40 points. The bold figures indicate the maximum points per question.

The usage of pocket calculators, textbooks, lecture notes, dictionaries is not permitted. Notes on this exercise sheet will be disregarded during the grading. Give answers exclusively in your working sheets; leave a margin of 3cm.

Undecipherable scribbling will not be graded. Use the terminology and the mathematical tools presented in the lecture and the tutorial; make clear how you derive your results.

1. The annual gross value of a communal meadow is given by the function $V(k) = ak - k^2$ (where k is the number of cows that graze on the meadow). The cost of buying and maintaining a cow amounts to c , with $a > c > 0$. The population of the village is greater than $a - c$, and each inhabitant is endowed with enough money to afford one cow.
 - a) Derive the marginal product and the average product. (4)
 - b) Derive the socially optimal number of cows. (3)
 - c) What is the individual profit if the number of cows is optimal? (5)
 - d) Derive the equilibrium number of cows if access is unrestricted. (3)
 - e) What is the individual profit in equilibrium? (5)
 - f) Explain verbally why the equilibrium number deviates from the optimal number. (6)
 - g) Show in a diagram how the equilibrium deviates from the social optimum. (6)
 - h) What policy measures could be employed to alleviate this problem (how and why)? (8)



2. Two countries C and D exist which produce only two goods, S and T. The inhabitants always consume these goods in identical quantities. Given the respective production technology and factor endowment, C could produce either max. 100 T or max. 300 S (or any linear combination); D can produce max. 100 T or max. 100 S (or any linear combination).

- a) Which country has an absolute advantage in the S-, and which in the T-production? (4)
 - b) Explain which country has a comparative advantage in the S-production. (4)
 - c) Derive and draw (in a diagram) the individual and the world production frontiers. (6)
 - d) Derive (and show in the diagram) the individual autarky production plans and the total world production without trade. (7)
 - e) Explain for all parts of the world production frontier who specializes on what. (5)
 - f) Derive the slopes of the world production frontier. (6)
 - g) Can the two countries improve the situation without specialization? (2)
 - h) Derive the optimal world production plan and the world's potential gain (in terms of S and T) from trade/specialization. (6)
3. The Y-industry is characterized by one-product-firms who operate with a total cost function $TC(y) = F + vy$, where y denotes a firm's output level (p denotes the price of Y).
- a) Write down the average cost $AC(y)$, marginal cost $MC(y)$, and variable cost $VC(y)$ functions. (3)
 - b) Prove the following theorem: $MC(y) > AC(y) \Leftrightarrow dAC(y)/dy > 0$. (8)
 - c) Give two real-world examples for industries with declining average cost. (8)
 - d) Suppose that $AC(y)$ is declining when intersecting the demand curve. What is the optimal number of firms to operate in this market? (2)
 - e) Which problem arises if, in d), the quantity is supplied at which $p = MC(y)$? (4)
 - f) Assume the market described in d) is operated by a single firm. What is the second-best optimal price-quantity combination? (2)
 - g) Explain why an unregulated single firm would not set the second-best price. (4)
 - h) Draw a diagram showing the $AC(y)$ and the demand curve; indicate the second best solution, the monopoly price, the firm's loss inflicted by setting $p = MC(y)$, and the welfare loss due to the monopoly price. (9)