Examination "Accounting Theory" **(20316)** **Winter term 2010/11**
Examiner: Prof. Dr. Alfred Luhmer

This examination contains 5 problems on 2 pages. Please check that you have got the complete set.
The numbers in parentheses with each problem signify the points to be earned for a perfect solution. The highest grade will be achieved with 60 points. So you have considerable freedom of choice.
Admissible aids: Pocket calculator, language dictionary (either electronic or in book form), lecture notes (hardcopy only, no electronic aids admitted except the pocket calculator.)

A useful formula:
The certainty equivalent of a normally distributed payoff with expectation μ and variance σ^2 for a decision maker with constant absolute risk aversion ρ is $\mu - \rho\sigma^2/2$.

1	2	3	4	5	Σ	Grade
/16	/12	/15	/10	/30		

Problem #1: Consider a dual-product production process with the quantity q_j of output j constrained by: $q_j \leq F_j(K_j, L) = K_j L$; (j=1,2) where K_j denotes a product specific capital input and L a labor input common to both products. Let w denote the wage rate per unit of labor input L and p_j the user cost per unit of capital K_j. Assume w=4 and $p_1=p_2=1$.

a. Determine the optimal factor inputs L^*, K_1^*, K_2^* as functions of the required output (q_1, q_2). (8)

b. Write down an explicit expression for the long-run cost function. (3)

c. Write down an explicit expression for the short-run cost function on condition that L=2 has been fixed in advance. (2)

d. Write down an explicit expression for the (long-run) cost function for partial program variation, given that $q_2=10$. (2)

e. Indicate whether the production process has decreasing, constant or increasing returns to scale. (1)

Problem #2. A project generates cash flows of 14, 15 and 8 at the end of periods 1, 2 and 3, respectively. The acquisition cost, payable at the beginning of period 1 is 25. Determine the continuation present value at times 0, 1 and 2 and the economic incomes for periods 1 to 3 in two different ways. Assume a market interest rate of 5% p.a. (12)

Problem #3. Reconsider the project of problem #2. Assume the acquisition cost is depreciated using the straight line method. Determine:

a. the accounting incomes from the project for periods 1 to 3. (3)

b. the residual incomes from the project in these two periods. (6)

c. Check that Preinreich's theorem holds at times 0 and 1. (6)

Problem #4. Assume the normal capacity of a maintenance unit is 1600 maintenance hrs per month. Normal cost at this capacity is € 32 000, € 20 000 of which are fixed. In November last year 1200 hrs of maintenance work were done. The actual cost amounted to € 30 000. Calculate

a. the amount of maintenance cost absorbed (2)

b. the flexible cost budget C(x) as a function of actual volume x, (3)

c. the efficiency variance (3)

d. and the (unabsorbed) cost of idle capacity (2)

Problem #5. A firm wants its manager to maximize its accounting profit. Profit before management compensation is $G(a) = 3a+\varepsilon$ where a denotes the manager's effort level and ε a normally distributed random variable with zero mean and variance $\sigma^2 = 10$. The manager`s personal cost of effort is $C(a)=a^2/2$, his CARA is $\rho = 0.2$, and his reservation wage $U^{-1}(\underline{U})=1$.

a. Calculate the optimal effort level assuming effort is observable (first-best effort level) and the resulting profit after management compensation (4)
b. State the manager`s decision problem when he faces a linear contract offering a share s of $G(a)$ and a fixed salary F. Determine the optimal effort level and the optimal objective function value for the manager (8)
c. State the principal's problem in formal terms, concerning the optimal linear contract he should offer to a manager who behaves according to part c. (10)
d. Calculate the optimal share of the profit $G(a)$ and the optimal fixed salary in a linear incentive scheme. (4)
e. Calculate the Agency Costs (4)