Original

Examination: Management Accounting **Winter semester: 2001/02**

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Candidate: Last name: First name:

Matriculation Number:

1	2	3	4	5	6	Σ

The following aids can be used: calculator

Hint: A total of 120 points can be achieved. For each problem 20 points are achievable. You are advised to base your time allocation on these points.

Please enter your answers in the space provided in these sheets and return for grading. Only answers in these sheets will be considered.

This problem set consists of 7 pages. Please check whether it is complete.

Problems:

1. A company has two departments: procurement and production. The existing cost system treats procurement costs as overhead costs and allocates them according to direct material costs. Procurement costs were 1200 in January while production overhead cost amounting to 1000. Production overhead is allocated using machine hrs. General and administrative (G&A) costs were 700 and are allocated on the basis of total cost before G&A. Two customers A and B were served in January whose orders required the following inputs:

	A	B
Direct Material	2000	1000
Direct labor	1200	600
Machine hrs.	400	400
Revenue	5000	3000

The company considers introducing ***ABC*** and has figured out that procurement cost is driven by the number of orders to be processed in the procurement department. Customer A caused 100 procurement orders, customer B 300. G&A cost would be allocated to customers according the contribution "Revenue – all other allocated costs".

Required:
Calculate the cost allocated to the two customers

a) by the existing costing system
b) by the ABC system.
c) Assume half of the production overhead is fixed depreciation. What is the contribution margin of each customer over flexible cost?
d) Which of the customers seems to be more profitable according to each of the costing systems? What system's results are informative for management? Why?

Fill in your numerical answers in the following tables on the following next page.

a)	Customer A	Customer B
Procurement cost		
Production overhead		
Direct cost		
G&A		
Total allocated cost		

b)	Customer A	Customer B
Procurement cost		
Production overhead		
Direct cost		
G&A		
Total allocated cost		

c)	Customer A	Customer B
Procurement cost		
Production overhead		
Direct cost		

d)

2. Assume the normal capacity of a cost center is 150 machine hrs. per month. Normal cost at this capacity is € 15 000, € 5000 of which are committed costs. Actual volume in January 02 was 120 machine hrs. Actual cost amounted to € 13 500.

Required: Calculate

a) the ***flexible cost budget*** C(x) as a function of actual volume x,
b) the cost budget of the center for January 02,
c) the ***usage variance*** for January 02,
d) the cost of idle capacity, for January 02.
e) The company rejected a contract offer of the municipality who wanted to replace all the 50 years old flag posts in the city. The contract would have required 20 machine hrs. at a contribution margin of € 80 per machine hr. Analyze the rejection decision.

Answers:

a) C(x) =

b) Cost budget for January =

c) Usage variance in January =

d) Cost of idle capacity in January =

e)

3. ***Break-even Analysis.*** The logo of Bayer AG is shown above their Leverkusen factory composed of a large number of light bulbs. A traditional light bulb consumes 100W, has a life time of 1000 hrs., and costs € 1. An economy bulb with the same candle power costs € 8, consumes only 20W, and is claimed to be four times as durable as the traditional one.

Required:

a) Calculate the ***break-even*** level of the energy price per kWh up to which the economy bulb is not yet worth while. (Ignore interest cost and wage cost for the replacement activity.)

Answer:

b) Assume the wage cost to replace a bulb is € 1. How does this affect the break-even level of the energy price?

Answer:

c) Assume the logo is illuminated approximately 4000 hrs. a year. Traditional bulbs are replaced four times, economy bulbs only once a year. How would the break-even energy price in requirement b) change when a required rate of return of 10% on tied-up capital is taken into account. (Treat replacement wage cost as additional investment whose lifetime is equal to the one of the bulb.)

Answer:

4. ***Reciprocal cost attribution.*** A company has two service departments A and B. A consumes 50 units of its own service, delivers 200 units to B and 250 units to other departments. B's total service volume is 400, 200 of which go to A, 200 to the other departments. A's traceable cost amounts to 4000, B's traceable cost is 8000.

Required:

a) Determine the charge rates for the services of A and B.

Answer:

b) Show that the same charge rates may be calculated without any information on the internal consumption of A's own service.

5. ***Evaluating investments.*** A manager is to evaluate the purchase of a new machine tool at a purchase price of € 100 (000s omitted). Its useful life is two years, cash flow expected for the first year is € 2, for the second year € 118. The company uses a required rate of return of 10% p.a. before tax and SYD depreciation (depreciation rate in year t: (T–t)/(1+2+...+T), T denoting life time). The corporate tax rate is 50%. The manager gets a bonus based on pre-tax accounting income (which is expected to be positive, irrespective of whether the machine is bought or not.) His personal discount rate is 5% (ignoring personal taxation).

Required:
Evaluate the profitability of the machine

a) ignoring taxes
b) profitability accounting for taxes.
c) Show that, in the present case, after-tax residual income as a basis for the incentive pay aligns the manager's self-interested investment decision to the owners' objectives.

Answers:

6. ***Performance measurement.*** A company uses RoI as a performance measure for its operating divisions. A summary of last year's reports from two divisions is shown below. The same cash flow and depreciation amounts are expected for the year to follow. The company's cost of capital is 10%.

	Division A	Division B
Book value of capital invested:	$ 1600	$ 4000
Cash Flow	$ 1000	$ 2000
Depreciation	$ 800	$ 1500

Required:

a) Which division seems more profitable under RoI, under residual income? (Answer the question for both years).
b) Is residual income of one year sufficient to adequately evaluate the profitability of a division in that year? If so, why? If not, why not?
c) At what cost of capital would the two divisions be considered equally profitable in the second year?
d) Suppose the manager of Division A were offered a one-year project that would increase his investment base by $400 and show a profit of $60. Will the manager accept this project, his performance being evaluated on his divisional RoI in the first year? In the second year?
e) What would the project mentioned in c) add to the residual income of division A?

Answers: