PROBLEM SET: Capital Budgeting

Exercise 1.

A corporation's Annual Report contains the following information:

Sales: 2,000,000 kr.
Variable costs: 850,000 kr.
Overhead costs: 395,000 kr.
Depreciation: 248,000 kr.
Corporate tax rate: 34%

Calculate the corporation's after-tax cash flows

1. 582,620 kr.
2. 724,620 kr.
3. 755,000 kr.
4. 977,620 kr.
5. I choose not to answer.

Exercise 2. *Project* [4]

A project has a cost of 240. It will have a life of 3 years. The cost will be depreciated straight–line to a zero salvage value, and is worth 40 at that time. Cash sales will be 200 per year and cash costs will run 100 per year. The firm will also need to invest 60 in working capital at year 0. The appropriate discount rates is 8%, and the corporate tax rate is 40%. What is the project's NPV?

Exercise 3. *T-bone Pickens.* [4]

T-bone Pickens is a corporate raider. This means that he looks for companies that are not maximising profits, buys them, and then tries to operate them at higher profits. T-bone claims that he learned his methods from studying agricultural economics at the School of Animal Husbandry where they taught him to "buy sheep and sell deer."

He is considering a bid for a local trucking company, Capon Truckin', but he needs to find out whether the company is maximising profits. He knows that Capon has the following investment opportunities:

Project	Initial cost	Annual cash flow
A	$20 mill	$ 20 mill
B	50 mill	40 mill
C	100 mill	50 mill
D	150 mill	24 mill
C	200 mill	20 mill

The cash reserves of the firm is $320 mill. The annual cash flows above are perpetual. Capon's opportunity cost of capital is 20%.

Current management of Capon plans to borrow an additional $ 200 mill from the bank to invest in all five projects. The loan is perpetual and will carry a 20% interest rate.

1. What is the value of the firm's common stock with the managements investment plans?
2. T-bone decides to acquire Capon and change the investment program to maximise the shareholder value. What changes will T-bone need to make?
3. If T-bone is able to purchase the firm's shares for the price you computed in a), and implement the changes you suggested in b), how much will T-bone make on his takeover of Capon Truckin'?

Exercise 4. *Halcyon Lines (BM 3.5)* [3]

Halcyon Lines is considering the purchase of a new bulk carrier for $8 million. The forecast revenues are $5 million a year and operating costs are $4 million. A major refit costing $2 million will be required after both the fifth and tenth years. After 15 years, the ship is expected to be sold for scrap at $1.5 million.

1. If the discount rate is 8 percent, what is the ship's NPV?

Exercise 5. *Contract* [2]

Today a firm signed a contract to sell a capital asset for $90,000. The firm will receive payment five years from today. The asset cost $60,000 to produce.

1. If the interest rate is 10%, is the firm making a profit on this item?
2. At what interest rate will the firm break even?

Exercise 6. *Laser Research* [4]

The management of Laser Research is trying to decide whether or not to undertake the following project:

- Cost: $5 mill.
- After-tax cash flows: $1 mill per year for seven years.
- Risk level: Requires a 8% discount rate.

Help the management make its decision.

1. Should Laser Research undertake the project?

Exercise 7. *Projects* [2]

You are given the following information about three projects. Each project last for one period only.

Project	Investment Outlay (C_0)	Rate of return (IRR)
A	1	8%
B	1	20%
C	2	4%

1. Find the cash flow in period 1 (C_1).
2. Suppose the opportunity cost of capital is 10%. Calculate the net present value (NPV) of each of the three projects.
3. Which projects would you accept?

Exercise 8. *PU* [6]

Pittsburgh utilities company (PU) has been advised by the EPA that it must buy a charcoal scrubber to put on its smokestack or face an after-tax fine of $30,000 per year. The scrubber currently available cost $300,000. By installing the scrubber, PU can reclaim $35,000 of marketable minerals and acids every year. The useful life of the scrubber is five years, after which it has no salvage value. The scrubber can be depreciated on a straight line basis over 5 years. At the end of 5 years, PU estimates the price of scrubbers will have dropped to $250,000. PU estimates its required rate of return, or cost of capital, to be 10% per year. PU's corporate tax rate is 30%.

1. From a purely financial standpoint, should PU buy the scrubber or pay the fines?
2. What is the smallest EFA fine that would ensure the scrubber is installed?