

REVIEW SET 2

work before class on November 5, 2008

Note – will not be collected or graded = self correct during class.

NAME : _____

Ch. E. 453

October 31, 2007

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EXAM NO. 2

Open Book and Notes

(20 points)

1. Adventure Airlines recently ordered a new baggage crusher for \$230,000. It is expected to last for 11 years and have an estimated salvage value of \$8,500. The crusher will be placed in service on November 5, 2007 and under current tax law is considered to have an MACRS recovery period of 7 years.
 - a) **Determine the U.S. tax law depreciation deduction charge on the crusher for 2007, 2008, and 2009 and the tax book value at the end of 2009 ?**

 - b) Adventure Airlines' baggage crusher actually lasts 13 years and is sold as scrap metal in 2020 for \$875. If the time value of money is 3.5% effective annual interest and the combined federal and state income tax rate stays at 41%, **what is the present worth of the after tax salvage income value ?**

(20 points)

2. An engineer deposits **\$3,000** in an Individual Retirement Account (IRA) each year during their **40** year career. Assume the investment earns a nominal annual **8.3** % rate of return compounded annually with annual deposits being made at the end of each year. What uniform annual income can be withdrawn from the investment for the **30** years following retirement ? (note this will withdraw all the money from the fund by the 30th year)

(30 points)

3. The Vandal•Con Company currently earns an average after tax rate of return of 13.35 % on all its investments. The board of directors of Vandal•Con is considering four mutually compatible proposals (i.e., all 4 proposals could be accepted, or any combination, or none of them) whose after tax cash flows are specified in Table 3 :

Table #3

End of Year	Proposal A	Proposal B	Proposal C	Proposal D
0	-\$ 73,000	-\$ 89,000	-\$ 78	-\$ 93,000
1	\$ 17,000	\$ 19,700	\$ 210	\$ 17,000
2	\$ 17,000	\$ 19,700	\$ 230	\$ 36,700
3	\$ 17,000	\$ 19,700	\$ 0	\$ 32,000
4	\$ 17,000	\$ 19,700		\$ 44,000
5	\$ 17,000	\$ 19,700		\$ 0
6	\$ 17,000	\$ 19,700		
7	\$ 17,000	\$ 19,700		
8	\$ 0	\$ 19,700		

Which proposal(s) is (are) acceptable if the board of directors has set a target Minimum Acceptable Discounted Cash Flow Rate of Return (MARR) after taxes of 14.7 % ?

State all assumptions and explain your reasoning.

Is the discounted cash flow rate of return { DCFR or IRR } less than, equal to, or greater than 14.7 % ?

Is it less than, equal to, or greater than 13.35 % ?

(30 points)

4. A mixer-settler extraction train is to be built to extract a valuable metal from an aqueous waste solution before discharge. At this point in the process the recovered metal is valued at 85 cents/lb. Any metal not extracted is lost to a tailings storage pond. The corporation is achieving a 17% ROI (standard before-tax percent return on Fixed Capital investment including straight line capital recovery as an expense) and desires 20% ROI on new investment opportunities.

From the information given below, **recommend the economic optimum number of extraction stages to be purchased?** Explain and numerically justify your decision.

Feed solution contains: **1,000,000 lb.** metal per year.

Equipment life: **7 years.**

Number of Extraction Stages	2	3	4	5
Fixed Capital Investment,	\$125,000	\$175,000	\$221,000	\$274,000
Metal Recovery %,	76.0%	94.0%	97.5%	99.0%
Annual Operating Costs, (excluding depreciation)	\$31,000	\$41,000	\$55,130	\$59,000

Note: average score on this exam was 78% \pm 18;
 scores ranged from 26 to 100, median was 85,
 8 scores were 90 or above, 5 scores were below 59