

Name: Answers

Quiz 4
Spring, 2008

ID# _____ (last 4 digits)

1. A flood control project will have a first cost of \$1.4 million with an annual maintenance cost of \$40,000 and a 10 year life. Reduced flood damage is expected to amount to \$175,000 per year. Lost income to farmers is estimated to be \$25,000 per year. At an interest rate of 10% per year, calculate the B/C ratio and determine if the project be undertaken? Both answers must be correct to obtain credit.

$B/C = (175000 - 25000) / 267,850 =$ $B = 175,000$
 $C = 1,400,000 (A/P, 10\%, 10) + 40000 = 267,850$
 $D = 25,000$

Answer: B/C ratio = 0.56 Should the project be undertaken? Yes or No (circle one)

2. A contractor is considering whether he should buy or rent another bulldozer. The one he is considering will cost \$50,000 with a maintenance cost of \$15,000/yr and an operating cost of \$50 per day. Its salvage value will be \$22,000 if sold after the 5 year study period. If rented on a daily basis, the cost will be \$250 per day. At an interest rate of 10%/yr, determine the number of days per year the equipment must be needed for breakeven.

$-250x = -50000 (A/P, 10\%, 5) - 15000 + 22000 (P/F, 10\%, 5) - 50x$
 $-200x = -50000 (0.26380) - 15000 + 22000 (0.16380)$
 $-200x = -24586.90 = 122 \text{ Days}$

Answer: 122 days

3. The benefits, disbenefits, and costs shown below are for mutually exclusive alternatives. At an interest rate of 10% per year, which one, if any, should be selected?

Project ID	Benefits, \$/yr	Disbenefits, \$/yr	Costs, \$/yr
A	615,000	36,000	500,000
B	200,000	30,000	180,000
C	400,000	25,000	290,000

Answer: DN $DN \text{ vs. } B: B/C = (200 - 30) / 180 = 0.94$

4. Determine the economic life cost of an asset in year 1 which has the costs shown below @ i = 10%.

Year	Cost, \$	Salvage value, \$
0	-20,000	-
1	-5,000	10,000
2	-6,500	8,000
3	-9,000	5,000
4	-11,000	5,000
5	-15,000	3,000

~~$AW_1 = -20000 (A/P, 10\%, 1) - 5000 (P/F, 10\%, 1) (A/P, 10\%, 1)$~~
 $AW_1 = -20000 (A/P, 10\%, 1) - 5000 (P/F, 10\%, 1) (A/P, 10\%, 1) + 10000 (A/P, 10\%, 1) = -17000$

Answer: \$ -17000 in year 1

5. Write the equation for the modified B/C ratio.

Answer: modified B/C Ratio = $\frac{B - D - M_{AO}}{C}$; where B = Benefits
 D = Disbenefits
 M_{AO} = Maintenance & Operation
 C = Costs