

Q1: Determine the payback Period.

yr	Cash F
0	-100
1	25
2	25
3	25
4	25

$i = 6\%$

Q1 solution:

$$\text{Formula} = PV = A \cdot \frac{1 - (1 + r)^{-n}}{r}$$

$$= 100 = 25 \cdot \frac{1 - (1 + 6\%)^{-n}}{6\%}$$

$$= \frac{100}{25} \cdot 0.06 = 1 - 1.06^{-n}$$

$$= 1.06^{-n} = 1 - 0.24$$

$$n = \frac{0.1192}{0.0253} = n = 4.71$$

payback is 4.71 yrs

Q2: Determine Break-even Annual Revenue.

first cost = \$30k

Annual O&M = \$500 / N = 24 yrs

Annual Rev = \$2,500k

Salvage = \$100 / $i = 2\%$

Q2 solution:

$$-30,000 = (A/P, 0.02, 24) \cdot (100) + 100 \cdot (A/F, 0.02, 24) - 0$$

$$(A/P, 0.02, 24) = 0.02 \cdot \frac{1 - \frac{1}{(1 + 0.02)^{24}}}{1 - \frac{1}{(1 + 0.02)^{24}}} = 0.052871$$

$$(A/F, 0.02, 24) = \frac{0.02}{1 + (0.02)^{24} - 1} = 0.032871$$

formula: $(A/P, i, n) = \frac{i}{1 - \frac{1}{(1 + i)^n}}$
 formula: $(A/F, i, n) = \frac{i}{(1 + i)^n - 1}$

$$X = [-30,000 \cdot (0.052871) + (X - 500) + 100 \cdot (0.032871)] = 0$$

Break Even annual revenue = \$2082.84

CDF HW7

