Problem 1

(a)
Based on the straight-line depreciation method, the estimated book value after 6 years is

$$\$500000 - 6 \cdot \frac{\$500000 - \$80000}{8} = \$185000$$

The difference between book value and sold market is,

$$\$210000 - \$185000 = \$25000$$

(b)
Recaptured Depreciation

(c)

$$\text{Capital Gain} = \$25000$$

Therefore,

$$\text{Tax} = \$25000 \cdot 0.33 = \$8250$$

is owed.

Problem 2

(a)

$$\text{annual saving} = (\$0.06 - \$0.045) \cdot 12 \cdot 10^6 = \$180000$$

$$\text{payback period} = \frac{\text{first cost}}{\text{annual saving}} = \frac{\$700000}{\$180000} = 3.888888 \approx 3.9 \text{ years}$$

(b)

$$\text{Depreciation} = \frac{\$700000}{5} = \$140000$$

$$\text{annual cashflow} = ((\$0.06 - \$0.045) \cdot 12 \cdot 10^6 - \$140000) \cdot (1 - 0.4) + \$140000 = \$164000$$

$$\text{payback period} = \frac{\$700000}{\$164000} = 4.26829268 \approx 4.3 \text{ years}$$

(c) Annual Cashflow

year	cashflow
0	-700000$
1	164000$
2	164000$
3	164000$
4	164000$

year	cashflow
5	164000$

Let the IRR be i then,

$$\sum_{i=0}^{5} \frac{\text{Cash Flow}}{(1+i)^t} = 0$$

Then $i = 5.5\%$ (See Excel File Attached).

Problem 3

See Excel File attached.

Problem 4

$$\text{WACC} = \frac{\$68 \cdot 10^6 \cdot 0.063 + \$79 \cdot 10^6 \cdot 0.045 + \$94 \cdot 10^6 \cdot 0.13}{\$68 \cdot 10^6 + \$79 \cdot 10^6 + \$94 \cdot 10^6} = 0.0832323651 \approx 8.3\%$$