P11-1

a. Depreciable cost: Cost – Salvage value = $20,000 – 2,000 = $18,000

Straight-line method; Straight-line Percentage: 1/5 = 20%

Year	Depreciation Expense	Total Accumulated Depreciation	Book Value
2002	3,600	3,600	16,400
2003	3,600	7,200	12,800

Double-Declining Balance Method
Percentage = 2 × 20% = 40% applied to remaining book value

Year	Remaining Book Value	Depreciation Expense	Total Accumulated Depreciation	Book Value end of the year
2002	20,000	8,000	8,000	12,000
2003	12,000	4,800	12,800	7,200
2004	7,200	2,880	15,680	4,320
2005	4,320	1,728	17,408	2,592
2006	2,592	1,037	18,445	1,555
2006	2,592	592	18,000	1,555

Units of Production Method (Cost – Salvage) / Estimated Output
= ($20,000 – 2,000) / 36,000 = $0.50 per unit

Year	Estimated Output	Depreciation Expense	Total Accumulated Depreciation	Book Value end of the year
2002	12,000	12,000 × .5 = 6,000	6,000	14,000
2003	10,000	10,000 × .5 = 5,000	11,000	9,000

b. Depreciation Expense—Forklift 3,600
Accumulated depreciation—Forklift 3,600

(to record depreciation expense in 2003 under straight-line method)

c. Theoretically, the President should select the method that best allocates the cost of the asset to the benefits derived from the asset over its useful life. Practically, the President may be influenced by the effect that depreciation has on the company's reported profits.

Straight-line method: Assumes that the company derives benefit evenly over the five-year life and that the costs of maintenance and productive output are evenly distributed. Practically, straight-line depreciation will result in the lowest expense and the highest profit of the three methods over the first two years of the asset's life.

Double-declining balance method: Assumes that the benefit derived from the asset will be much greater in its early years. Practically, this results in much greater depreciation and the lowest income of the three methods over the first two years of the asset's life.

Units of production method: This method is most closely tied to the physical use of the asset. It can result in potential manipulation of income, as reduced usage in a period will result in lower depreciation expense and higher income in that period.

d. Book value of $12,000 means total accumulated depreciation would be $8,000. The sale of the asset for $15,000 will result in a gain of $3,000.

Cash	15,000	
Accumulated depreciation	8,000	
Forklift		20,000
Gain on sale of forklift		3,000

(to record sale of forklift for $3,000 more than book value)

P11-2

a. Silverman Corporation should be willing to pay no more than the present value of the future net cash inflows of the asset, discounted at a rate of 12%. (Taxes are ignored.)

$$\sum_{t=1}^{4} \frac{6{,}000}{(1.12)^t} = \$\ 18{,}224$$

b.

Dec. 31, 2003	Dec. 31, 2004	Dec. 31, 2005	Dec. 31, 2006
∑3t = 1 6,000	∑2t = 16,000	6,000	0
(1.12)t	(1.12)t	(1.12)1	(1.12)0
= $14,411	= $10,140	= 5,357	= $0

An alternative tabular form of the calculations required for parts a and b is explained and presented below:

At any date, the economic value of the machine should be the present value of the remaining future net cash inflows of the asset, discounted at a rate of 12%. When Silverman purchased the asset at the beginning of 2003, net cash flows will be received at the end of 2003, 2004, 2005, and 2006. These should be discounted at 12% to the beginning of 2003 to obtain the present value of the machine's net cash flows as of the beginning of 2003. At the beginning of 2004, net cash flows will be received at the end of 2004, 2005, and 2006. These should be discounted to the beginning of 2004 to obtain the present value of the machine's net cash flows as of the beginning of 2004. This procedure is repeated to obtain the present values of the machine's remaining cash flows as of the beginning of 2005 and 2006. The following table displays these calculations.

Year	Cash flow received at end of year	Present value at beginning of cash flow in column 2 as of the beginning of year*			
		2003	2004	2005	2006
2003	$6,000	$5,357.14			
2004	$6,000	4,783.16	$5,357.14		
2005	$6,000	4,270.68	4,783.16	$5,357.14	
2006	$6,000	3,813.11	4,270.68	4,783.16	$5,357.14
Present value of all remaining cash flows = value of machine		$18,224.10	$14,410.99	$10,140.31	$5,357.14

*Note:
$5,357.14 = $6,000/(1.12)[1]
$4,783.16 = $6,000/(1.12)[2]
$4,270.68 = $6,000/(1.12)[3]
$3,813.11 = $6,000/(1.12)[4]

c. The economic depreciation each year will be the difference between the economic value at the beginning of the year and the economic value at the end of the year.

Year	Economic Value—Beginning of the Year	Economic Value—End of the Year	Economic Depreciation
2003	18,224	14,411	$3,813
2004	14,411	10,140	4,271
2005	10,140	5,357	4,783
2006	5,357	0	5,357
Total Economic Depreciation			18,224

d. The accounting depreciation would have been $4,556 each year ($18,224 × 25%).* *Note: The total accounting depreciation is $18,224 ($4,556 × 4).

e. Economic depreciation is the decline in the value of the asset, based on the present value of the expected remaining future cash flows from the asset. Economic depreciation can be increasing, decreasing, or level over time, depending on the interest rate used and the pattern of cash flows. Accounting depreciation makes no effort to take into account future cash flows. Rather, accounting depreciation merely requires that a *systematic* and *rational* method be used to record the reduction in value of the asset.

f.

Year	Economic value	Accounting value	Economic value/ Accounting value
2003	14,411	13,668	1.054
2004	10,140	9,112	1.113
2005	5,357	4,556	1.176
2006	0	0	—

The pattern of cash flows and the interest rate combine in this case to make economic depreciation occur faster than straight-line GAAP depreciation. This means that the ratio of the economic value of the machine to its book value is greater than one in all periods of the asset's life. Everything else equal, this will push Silverman's market-to-book ratio above 1 while the asset is in service. Eventually, both methods will depreciate the entire $18,224 original cost of the asset; so in the long run, the market-to-book ratio will revert to 1, everything else equal.

P11-3

a. Straight-line percentage = 1/4 = 25%

Straight-line depreciation each year is $32,000 × .25 or $8,000.

b. Percentage equals 25% × 2 = 50%

Year	Remaining Book Value	Percentage	Depreciation Expense	Book Value end of the year
2003	32,000	50%	16,000	16,000
2004	16,000	50%	8,000	8,000
2005	8,000	50%	4,000	4,000
2006	4,000	NA***	4,000	0

*** If the company does not switch to straight-line, the asset would not be fully depreciated. The company will just take the remaining book value as depreciation expense.

c. Straight-line method

2003	Depreciation expense	8,000	
	Accumulated depreciation		8,000
2004	Depreciation expense	8,000	
	Accumulated depreciation		8,000

Declining-balance method

2005	Depreciation expense	16,000	
	Accumulated depreciation		16,000

2006	Depreciation expense	8,000	
	Accumulated depreciation		8,000

d. Straight-line depreciation results in the lowest depreciation expense in 2000; therefore, it will result in the highest net income.

e. Straight-line method:

Cost	$32,000	
Accumulated depreciation ($8,000 × 3)	24,000	
Book Value	$ 8,000	
Sale price	$12,000	
Gain	$ 4,000	

Cash	12,000	
Accumulated depreciation	24,000	
Long-lived asset		32,000
Gain on sale of asset		4,000

f. Declining-balance method

Cost		$32,000
Accumulated depreciation	28,000	
Book Value	$ 4,000	
Sale price	$12,000	
Gain		$ 8,000

Cash	12,000	
Accumulated depreciation	28,000	
Long-lived asset		32,000
Gain on sale of asset		8,000

P11-4

a.

Cash	60	
Accumulated depreciation	240	
Equipment		240
Gain on sale of equipment		60
(to record the sale of fully depreciated equipment for $60)		

Depreciation expense—Equipment	250	
Accumulated depreciation—Equipment		250
(to record depreciation expense for 2001)		

Equipment	400	
Cash		400
(to record purchase of new equipment for cash)		

b.

	Equipment	Accumulated Depreciation
Balance 1/01/01	$3,840	$920
Additions	400	250
Reductions	(240)	(240)
Balance 12/31/01	$4,000	$930

Net property plant and equipment at 12/31/2001 = $4,000 – 930 = $3,070

P11-5 a. Depreciation rate = 1/10 = 10% per year. $85,000 × .10 = $8,500. At December 31, 2007, 5 years of depreciation would have been taken. Total depreciation = $8,500 × 5 = $42,500

Book value = $85,000 – 42,500 = $42,500

b. The company must record an impairment loss of $24,500. The book value of the asset must be reduced to equal the present value of the expected future cash flows of $18,000. The loss can be recognized in one of two ways:

Impairment loss	24,500	
Accumulated depreciation		24,500

or

Impairment loss	24,500	
Equipment		24,500

c. Once an impairment has been recognized, a new depreciation schedule should be made depreciating the asset's remaining book value over its remaining useful life.

Remaining book value: $\frac{\$18,000}{}$ = $3,600 per year

Remaining useful life: 5 years

Depreciation expense	3,600	
Accumulated depreciation		3,600

d. Asset impairment tests are required whenever circumstances suggest that the asset's revenue generating ability may have significantly declined. Examples include:

- The market value of the asset has significantly decreased
- The way in which an asset is used has changed
- The company forecasts losses from the asset's continued use

Adverse business conditions or legal matters have affected the asset

e. The asset impairment test uses undiscounted future cash flows instead of the present value to reduce the frequency of required write-downs. Using the present value of future cash flows would result in even lower estimated future cash flows than the undiscounted future cash flows. This would increase the chances of an asset impairment write-down.

P11-6 a. Depreciation and amortization are added to net income in the operating section because they are non-cash operating expenses. They reduce net income, but are not a use of cash. Therefore, they must be added back to arrive at the cash provided by operating activities.

b. Cash received from the disposal of property is an investing activity. The entire amount of the cash flow should appear in the investing section. The gain is deducted from the operating section to avoid double counting. The amount of the gain is included in the caption "proceeds from disposal of property" in the investing section.

c.

Proceeds from sale of property	$6,086,000
Gain on disposal of property	(344,000)
Book value of property	$5,742,000

d. If the book value of the property was $5,742,000, its original cost must have been $6,142,000 (book value plus accumulated depreciation). The entry to record the sale would be:

Cash	6,086,000	
Accumulated depreciation	400,000	
Property		6,142,000
Gain on disposal of property		344,000

P11-7 a. Capitalized costs:

Sealed bid price	$200,000
Legal fees	3,000
Trucking expenses	104,783
Unloading/installation	10,500
Materials	35,400
Raw materials	1,000
TOTAL	$354,683

b. Costs that should not be capitalized include:

1) Cost to repair damage from machinery during unloading: $6,000. GAAP allow for the capitalization of all *reasonable* and *necessary* expenditures required to get the asset into its intended use. Careless handling that results in unnecessary damages would not be considered reasonable and necessary.

2) Interest paid on note to bank to finance purchase: $5,540. Interest is generally capitalized on self-constructed assets. This asset was purchased from another company. Interest on the loan should not be capitalized.

3) Casualty insurance policy on new machinery: $3,000. This is an on-going, routine cost. It is not part of the cost of acquiring the asset and should not be capitalized.

4) Cost of advertising the new manufacturing facility: $30,000. Although advertising has future benefits to a company, the exact nature of those future benefits is uncertain. Advertising is not capitalized.

c. Depreciable cost:

Capitalized cost:	$354,683
Estimated salvage value	(30,000)
Depreciable cost	$324,683

d. Straight-line percentage: 1/20 = 5%

2000: $324,683 × .05 × 1/4 = $4,059

2001: $324,683 × .05 = $16,234

e. Double-declining balance depreciation:

Straight-line percentage = 5% × 2 = 10%

2000: $354,683 × 10% × 1/4 = $8,867

2001: $354,683 – 8,867 = $345,816 × 10% = $34,582

f. The repair would be capitalized if the future service potential of the asset was increased. If the service life of the asset was extended, the quality of the asset's output enhanced, or the capacity of the asset was increased, then the repair should be capitalized. Otherwise, the repair should be expensed as ongoing repair and maintenance cost.

P11-8 a. Fair value = $1,000 – $532 = $468

b.

	2002	2003	2004	2005	2006	Total of the Five Years
Depreciation Ex-	93.6	93.6	93.6	93.6	93.6	468.0

pense						
Impairment Loss	532.0					532.0
Total	625.6	93.6	93.6	93.6	93.6	1,000.0

c.

	2002	2003	2004	2005	2006	Total of the Five Years
Depreciation Expense	200.0	200.0	200.0	200.0	200.0	1,000.0

d. The total amount written off is the same. The timing differs, however. Recognizing the impairment loss in 2002 records the reduction of income when it actually occurs—i.e., when the assets' value is impaired. Future depreciation expenses are then taken relative to the assets' value in 2002. In contrast, if the impairment loss is not recognized, the income effect is realized slowly over the next five years through excessive depreciation expenses.

P11-9 a. Anadarko's auditors would perform an asset impairment test by comparing the current book value of the assets to the undiscounted future cash flows from the assets. If the undiscounted future cash flows are less than the book value, the asset is deemed impaired. The company would then reduce the book value to equal the present value of the future cash flows.

b. Impairment loss 1.08 billion
Accumulated depreciation (various assets) 1.08 billion

c. The write-down will increase result in a loss on 2002's income statement, resulting in lower net income. On the balance sheet, assets and equity will decrease. The write-down has no impact on 2002's cash flow statement.

d. Because a substantial amount of assets were written off, Anadarko's future depreciation expense will be significantly lower, resulting in a higher net income in subsequent years. (The company estimated that net income could be about $100 million a year higher for the next several years).

e. Examples of circumstances that may result in asset impairment include:

- The market value of the asset has significantly decreased.
- The way in which the asset is used has changed.
- The company forecasts losses from the asset's continued use.
- Adverse business conditions or legal matters have affected the asset.

f. Theoretically, companies can capitalize the total of all costs required to get an asset into its intended use. If the technicians' labor costs are related to assets that will benefit the company over more than one accounting period, then capitalizing these costs is legitimate under GAAP.

g. The company probably capitalized labor costs that were not related to getting cable assets ready for use. It is possible that the costs associated with routine service visits rather than those associated with installing new cable lines were capitalized. These costs should be expensed.

h. Since the aggressive accounting took place in prior periods, the company should not record an expense in 2002. Instead, the adjustment should be recorded directly to retained earnings:

Retained earnings 80 million
Cable assets 80 million

i. The initial statement that the accounting error would help boost cash flows is misleading, since the company's cash balance was unaffected by the error. Instead, the journal should have reported that the error helped boost operating cash flows, since capitalized labor would appear as an investing cash flow and not an operating cash flow.

P11-10

a. Costs to be capitalized would be:

Cost of truck:	$32,000
Sales taxes	1,920
Painting name	500
Total	$34,420

These costs are all reasonable and necessary costs associated with getting the asset into its intended use. The gasoline, insurance and advertising should not be capitalized because they are normal operating expenses incurred after the truck has been put into use. The interest should not be capitalized because the truck is not a self-constructed asset. Interest costs associated with financing purchased assets must be written off as an expense.

b.

	Depreciation expense	Total accumulated depreciation	Book Value
Straight-line			
2003	$7,500	$7,500	$26,500
2004	$7,500	$15,000	$19,000

($34,000 – 4,000)/ 4 = $7,500 per year

Double declining balance			
2003	$17,000	$17,000	$17,000
2004	$ 8,500	8,500	8,500

1/4 = .25 × 2 = .5

2003 $34,000 × .5 = $17,000

2004 $17,000 × .5 = $8,500

Sum-of-the-years' digits			
2003	$12,000	$12,000	$22,000
2004	$ 9,000	$21,000	$13,000

1 + 2 +3 + 4 = 10 4/10 × $30,000 = $12,000

3/10 × $30,000 = $ 9,000

c. Depreciation expense: truck 7,500
Accumulated depreciation: truck 7,500

d. Total accumulated depreciation at 12/31/05 = 3 x $7,500 = $22,500
Book value = $34,000 – $22,500 = $11,500
Cash received = $16,000
Gain on sale = $ 4,500
Cash 16,000
Accumulated depreciation: truck 22,500
Truck 34,000
Gain on sale of truck 4,500

e. Cost – Salvage/Estimated mileage = Depreciation expense per mile driven

($34,000 – 4,000)/150,000 miles = .20 per mile × 37,000 = $7,400

Depreciation expense: truck 7,400
Accumulated depreciation: truck 7,400

P11-11

a. Equipment 800,000
Cash 800,000
Entry in 2003 and 2004:
Depreciation expense: equipment 160,000
Accumulated depreciation: equipment 160,000

b. Examples of circumstances that may result in asset impairment include:
- The market value of the asset has significantly decreased.
- The way in which the asset is used has changed.
- The company forecasts losses from the asset's continued use.
- Adverse business conditions or legal matters have affected the asset
- Self-constructed assets cost significantly more than originally estimated

c. Total accumulated depreciation = $320,000 (160,000 × 2)
Book value = $800,000 – $320,000 = $480,000

d. Since the book value of the assets exceeds the undiscounted future cash flows, the company is required to record an impairment loss. The asset should be written down to the present value of the expected future cash flows. The impairment loss will be the difference between the book value and the present value of the expected future cash flows ($480,000 – $160,000 = $320,000).

Impairment loss 320,000
Accumulated depreciation: equipment 320,000

Alternative entry:

Impairment loss 320,000
Accumulated depreciation: equipment 320,000
Equipment 160,000
Equipment 800,000

Book value before impairment loss: $480,000
Impairment loss (320,000)

e. Book value after impairment loss $160,000
Remaining useful life 3 years
Annual depreciation expense: $53,333
Depreciation expense: equipment 53,333
Accumulated depreciation: equipment 53,333

f. The principle involved is conservatism. Bad economic events are recorded when it is reasonably certain that they will happen.