# CHAPTER 9

## DISCUSSION QUESTIONS

**1.** The major characteristics of property, plant, and equipment are as follows:

**a.** They are physical objects that can be seen and touched.

**b.** They are used in operations to produce goods or provide services.

**c.** They usually have a useful life of two or more years.

**2.** Any expenditure incurred in the process of bringing an asset to operating condition is considered to benefit the company over the asset’s useful life and therefore is treated as part of the asset’s cost. In addition to the purchase price, the cost of a capitalized   
asset, such as a machine, might include sales tax, delivery charges, and setup costs.

**3.** The fair market values of the assets acquired are considered the best relative measure of future service potentials of the assets. Therefore, the cost of the assets purchased as a group is apportioned among them based on their relative fair values in order to recover the total cost over the economically useful lives of the assets acquired as a group.

**4.** Depreciation is an allocation of the cost of a building over its estimated useful life, not an estimate of the decline in value. Depreciation expense is recognized even though assets increase in value because the cost of assets must be expensed on the statement of comprehensive income.

**5.** It is impossible to conclude that any one depreciation method will result in a higher net income without specifically identifying an asset’s age. During the early years of an asset’s life, the straight-line method usually results in the highest net income; during the later years of an asset’s life, the accelerated methods usually results in the highest net income.

**6.** Declining-balance depreciation differs in the following two ways from other depreciation methods: (1) the initial computation of the declining-balance rate ignores the asset’s salvage value, and (2) a constant depreciation rate is multiplied by a decreasing carrying amount.

**7.** MACRS is an accelerated depreciation method allowed by the IRS. It is based on the double-declining-balance method. The purpose of MACRS is to allow taxpayers to rapidly report depreciation expense, thus reducing their income taxes and encouraging them to invest in new depreciable   
assets.

**8.** It is often necessary to recalculate the depletion rate for natural resources because the amount of the resource owned is usually an estimate, albeit based on scientific analysis and prior experience. For example, how do you determine how much oil is in a well? As new information becomes available, estimates of these types of reserves need to be changed.

**9.** When an estimate of an asset’s useful life is changed, the depreciation expense for previous years should not be recalculated. Accounting practice specifies that a change in estimate should be accounted for by changing the estimate in each of the subsequent years, but not on a retroactive basis.

**10.** An ordinary expenditure is one that benefits only the current period and does not increase an asset’s productive capacity or life. A capital expenditure is usually significant in amount and one that benefits future periods and increases the productive capacity or lengthens the life of the asset.

**11.** When in doubt, firms usually classify expenditures as ordinary rather than as capital expenditures. This is the conservative approach and does not allow assets to be recorded at amounts that exceed their future economic benefits.

**12.** Assets should not be recorded on the financial statements at amounts that exceed their market values. Therefore, impairments of asset value must be recognized as losses in the current period.

**13.** It is common to have a gain or a loss on the disposal of a long-term operating asset because at the time an asset is purchased, the useful life and salvage value can only be estimated. If either the actual life or the salvage value of an asset differs from the estimates made when the asset was purchased, there will be a gain or a loss. In the rare case where these estimates are exactly correct, there is no gain or loss if the asset is held for its entire useful life.

**14.** When recording the disposal of a long-term operating asset, it is necessary to debit the accumulated depreciation of the old asset because accumulated depreciation, as well as the original cost of the asset, must be removed from the books. If accumulated depreciation were not debited—hence, removed—balances that were associated with disposed-of assets would still be shown on the books. Eventually, the accumulated depreciation balance would exceed the costs of long-term operating assets.

**15.** Intangible assets are considered assets because they provide future benefits to a firm. Tangible existence is not a criterion in deciding whether or not something is an asset.

**16.** The fact that unsold businesses are not allowed to record goodwill can result in similar businesses having different kinds of financial statements. The accounts of a buyer of a firm might show higher assets than those of an unsold business because goodwill was part of the purchase. This difference in accounting could certainly affect many of the key financial ratios as well as the reported profitability of the companies.

**17.** Fixed asset turnover is computed as sales divided by average property, plant, and equipment (fixed assets) and is interpreted as the number of dollars in sales generated by each dollar of fixed assets.

## PRACTICE EXERCISES

### PE 9–1 (LO1) Long-Term Operating Assets

The correct answer is E. Office supplies are a current asset.

### PE 9–2 (LO2) Asset Purchased with Cash

Stamping Machine 129,840

Cash 129,840

*Purchased a stamping machine for $129,840*

*($124,000 retail price – $1,860 purchase discount +*

*$7,700 sales tax).*

### PE 9–3 (LO2) Asset Purchased Partially with Cash

Stamping Machine 129,840

Cash 89,840

Notes Payable 40,000

*Purchased a stamping machine for $64,920*

*($124,000 retail price – $1,860 purchase discount +*

*$7,700 sales tax). Paid $89,840 cash and*

*borrowed $40,000 from a bank.*

### PE 9–4 (LO2) Asset Purchased with Cash

Building ($980,000 + $220,000) 1,200,000

Cash 1,200,000

*Purchased a building for $1,200,000 ($980,000 +*

*$220,000 remodeling)*.

### PE 9–5 (LO2) Joint Assets

Land 400,000

Building 600,000

Cash 1,000,000

*Purchased land and a building*.

Fair Market Percentage of Apportionment of

Asset Value Total Value Lump-Sum Cost

Land $ 440,000 40% $ 400,000

Building 660,000 60% 600,000

Totals $1,100,000 100% $1,000,000

### PE 9–6 (LO2) Acquisition of Several Assets at Once

First, we need to allocate the correct percentages of the purchase price to the two assets—land and building—as follows:

Fair Market Percentage of Apportionment of

Asset Value Total Value Lump-Sum Cost

Land $240,000 25% 0.25 × $890,000 = $222,500

Building 720,000 75 0.75 × $890,000 = 667,500

Totals $960,000 100% $890,000

Now we can make the following entry to record the purchase:

Land 222,500

Building 667,500

Cash 890,000

### PE 9–7 (LO3) Straight-Line Method of Depreciation

Depreciation expense = 

= 

= $120,000

Depreciation Expense 120,000

Accumulated Depreciation 120,000

*To record depreciation expense on a straight-*

*line basis.*

PE 9–8 (LO3) Units-of-Production Method of Depreciation

Depreciation rate = 

= 

= $0.60 per unit

Current-year depreciation = Depreciation rate × Units produced

= $0.60 × 180,000

= $108,000

Depreciation Expense 108,000

Accumulated Depreciation 108,000

*To record depreciation expense on units-of-*

*production basis.*

### PE 9–9 (LO3) Partial-Year Depreciation Calculations

Full-Year Depreciation Depreciation

Depreciation\* First Year (3 months) Second Year (12 months)

$5,000 $1,250 ($5,000 × 3/12) $5,000

\*Full-year depreciation = 

= 

= $5,000

### PE 9–10 (LO3) Units-of-Production Method with Natural Resources

Depletion rate =  =  = $7.00 per barrel

First-year depletion = Depletion rate × Barrels extracted and sold

= $7.00 × 70,000

= $490,000

Depletion Expense 490,000

Accumulated Depletion, Oil Field 490,000

*To record depletion for the year: 70,000 barrels*

*at $7.00 per barrel.*

### PE 9–11 (LO3) Declining-Balance Method of Depreciation

DDB rate = 1/10 × 2 = 20%

Depreciation expense year 1 = $3,000,000 × 0.20 = $600,000

Depreciation expense year 2 = ($3,000,000 – $600,000) × 0.20 = $480,000

### PE 9–12 (LO4) Changes in Depreciation Estimates

Carrying amount after three years = $1,000,000 – (3 × $120,000) = $640,000

Depreciation expense year 4 = ($640,000 – $40,000)/8 years = $75,000

### PE 9–13 (LO5) Repairing and Improving Property, Plant, and Equipment

Original cost $ 150,000

Accumulated depreciation (prior to overhaul) 110,000

Remaining carrying amount $ 40,000

Capital expenditure (overhaul) 24,000

New carrying amount $ 64,000

Less salvage value 8,000

New depreciable amount $ 56,000

Remaining life ÷ 7 years

New annual depreciation ($56,000/7) $ 8,000

### PE 9–14 (LO6) Determining Asset Impairment

Original cost $830,000

Accumulated depreciation 581,000

Carrying amount $249,000

Recoverable amount $210,000

Because the recoverable amount is less than the carrying amount of the building, the asset is deemed to be impaired.

### PE 9–15 (LO6) Recording Decreases in the Value of Property, Plant, and Equipment

Impairment Loss ($249,000 – $210,000) 39,000

Accumulated Impairment Losses 39,000

*Recognized $39,000 impairment loss on building.*

### PE 9–16 (LO8) Discarding Property, Plant, and Equipment

Accumulated Depreciation, Truck 48,000

Loss on Disposal of Truck 12,500

Truck 60,000

Cash 500

*Scrapped $60,000 truck and recognized loss of*

*$12,500 (including $500 disposal costs).*

### PE 9–17 (LO8) Selling Property, Plant, and Equipment

Cash 14,000

Accumulated Depreciation, Truck 48,000

Truck 60,000

Gain on Sale of Truck 2,000

*Sold $60,000 truck at a gain of $2,000.*

### PE 9–18 (LO8) Selling Property, Plant, and Equipment

Cash 20,000

Accumulated Depreciation 24,000

Loss on Sale of Truck 6,000

Truck 50,000

*Sold $50,000 truck at a loss of $6,000.*

### PE 9–19 (LO9) Patents

Amortization Expense, Patent 30,000

Patent 30,000

*To amortize one-seventh of the cost of the patent.*

### PE 9–20 (LO9) Goodwill

Inventory 40,000

Property, Plant, and Equipment 190,000

Other Assets 72,000

Goodwill 55,000

Liabilities 67,000

Cash 290,000

*Purchased Little Company for $290,000.*

### PE 9–21 (LO10) Fixed Asset Turnover

Fixed asset turnover = 

= 

= 3.17 times

## EXERCISES

### E 9–1 (LO2) Accounting for the Acquisition of a Long-Term Asset

1. Machine 28,213

Cash 28,213

*Purchased machine ($25,000 cost + $750 in-*

*stallation + $900 testing + $1,563 sales tax).*

2. Machine 28,213

Note Payable 25,000

Cash 3,213

*Purchased machine, paying $3,213 with cash*

*and issuing a note for the remainder.*

### E 9–2 (LO2) Computing Asset Cost

Purchase price NT$ 540,000

Installation costs 1,000

Delivery cost 1,400

Total cost for the machine NT$ 542,400

The repair cost is not necessary cost. Therefore, it is not included in the cost of the machine.

### E 9–3 (LO2) Accounting for the Acquisition of Assets—Basket Purchase

Percent

Fair Market of Apportioned

Asset Value Total Cost

Land $245,000 35% $218,750

Building 350,000 50 312,500

Equipment 105,000 15 93,750

Totals $700,000 100% $625,000

Land (0.35 × $625,000) 218,750

Building (0.50 × $625,000) 312,500

Equipment (0.15 × $625,000) 93,750

Cash (or Notes Payable) 625,000

*Purchased land, building, and equipment.*

### E 9–4 (LO3) Depreciation Calculations

1. a. Straight-line method

2017:  = $5,000 × 1/2 year = $2,500

2018: $5,000

b. Units-of-production method

2017:  × 9,000 miles = $2,045

2018:  × 24,000 miles = $5,455

2. There is no definitive answer to the question of which depreciation method more closely reflects the used-up service potential of the car. If there is no obsolescence factor, then the asset probably would wear out based on use, for which the units-of-production method would appear to be more appropriate. If obsolescence is an important factor in determining the car’s useful life, the car’s service potential would probably decline on an accelerated basis because obsolescence affects a car’s fair market value more when it is newer than when it is older. The decline in service potential would also be affected by the extent to which the maintenance policy assumed in selecting the five-year life is actually followed during the five-year period.

### E 9–5 (LO3) Depreciation Calculations

1. Straight-line method:

Invoice cost $31,500

Installation 400

Total cost $31,900

Less salvage value 1,900

Depreciable amount $30,000

 = $2,000 per year

2. Units-of-production method

 × 51,000 cans = $1,800

### E 9–6 (LO3) Depreciation Computations

1. 2017: 10% × 1.5 = 15%; 15% × $760,000 = $114,000

2018: $760,000 – $114,000 = $646,000; $646,000 × 15% = $96,900

2019: $646,000 – $96,900 = $549,100; $549,100 × 15% = $82,365

2. Original cost $760,000

Accumulated depreciation ($114,000 + $96,900 + $82,365) 293,265

Carrying amount at December 31, 2019 $466,735

### E 9–7 (LO3) Depreciation Calculations

1. Double-declining-balance

2017: $62,800 × (10% × 2) = $12,560

2018: ($62,800 – $12,560) × 20% = 10,048

2. 150% declining-balance

2017: $62,800 × (10% × 1.5) = $9,420

2018: ($62,800 – $9,420) × 15% = 8,007

### E 9–8 (LO2, LO3) Computing Asset Cost and Depreciation Expense

1. Purchase price $32,000

Sales tax 1,400

Delivery costs 1,200

Assembly cost 900

Painting 500

Total cost $36,000

2. First full year’s depreciation, straight-line method: $36,000/16 years = $2,250.

### E 9–9 (LO2, LO3) Acquisition and Depreciation of Assets

1. 2018

July 1 Drilling Equipment 230,000

Cash 230,000

*Purchased drilling equipment.*

2. Straight-line =  × 1/2 year

= $18,800 × 1/2 year = $9,400

### E 9–10 (LO2, LO3) Acquisition and Depreciation of Assets

1. 2018

July 1 Drilling Equipment 185,000

Cash 185,000

*Purchased drilling equipment.*

2. a. DDB = $140,000 × 0.10 × 1/2 year

= $14,000 × 1/2 year

= $7,000

b. 150% DB = $140,000 × 0.075 × 1/2 year

= $10,500 × 1/2 year

= $5,250

### E 9–11 (LO2, LO3) Acquisition and Depreciation

1. Construction costs $15,000

Sales taxes on components 1,100

Delivery costs 700

Installation of motor 300

Painting 200

Total cost $17,300

2. First full year’s depreciation

Double-declining-balance: (10% × 2) × $17,300 = $3,460

### E 9–12 (LO2, LO5) Acquisition and Improvement of Assets

1. Machine 37,650

Cash 37,650

*Purchased machine ($35,000 cost + $1,600*

*installation + $1,750 sales tax – $700 discount).*

2. Repairs and Maintenance Expense 350

Cash 350

*To record repairs and maintenance expense on the*

*machine.*

3. Machine 500

Cash 500

*Purchased a governor for the machine.*

### E 9–13 (LO3, LO4) Accounting for Natural Resources

1. 2017

Jan. 1 Coal Mine 1,125,000

Cash 1,125,000

*Purchased coal mine.*

2. 2017

Dec. 31 Depletion Expense 250,000

Accumulated Depletion, Coal Mine 250,000

*To record depletion expense on the*

*mine for 2017 ($1,125,000/180,000 tons*

*= $6.25 per ton; $6.25 × 40,000 tons).*

3. January 1, 2018—No entry.

4. 2018

Dec. 31 Depletion Expense 162,800

Accumulated Depletion, Coal Mine 162,800

*To record depletion expense on the*

*mine for 2018 (40,000 × $4.07 per ton).*

Computation of new depletion rate:

Original cost $1,125,000

Less depletion in 2017 250,000

Amount to be depleted $ 875,000

 = $4.07 per ton

### E 9–14 (LO3, LO4) Change in Estimated Useful Life

Original depreciation:

$120,000 – $10,000 = $110,000/10 years = $11,000 per year

2017: $11,000 depreciation expense

2018: $11,000 depreciation expense

The change in estimate is calculated as follows:

$11,000 × 2 years = $22,000 (amount in accumulated depreciation)

($120,000 – $22,000) – $10,000 = $88,000 (new depreciable amount)

$88,000/6 years (remaining useful life) = $14,667

2019: $14,667 depreciation expense

E 9-15(LO3, LO4) Understanding Depreciation Concepts

1. False. Depreciation is a process of *cost allocation*, not *asset valuation*.

2. True.

3. False. The book value of a plant asset *may be quite different* from its fair value.

4. False. Depreciation applies to three classes of plant assets: land *improve­ments,* buildings, and equipment.

5. False. Depreciation does not apply to *land* because its usefulness and revenue-producing ability generally remain intact over time.

6. True.

7. False. Recognizing depreciation on an asset *does not result* in an accu­mulation of cash for replacement of the asset.

8. True.

9. False. Depreciation expense is reported on the income statement, and *accumulated depreciation is reported as a deduction from plant assets on the statement of financial position.*

10. True.

### E 9–16 (LO6) Asset Impairment

1.

1 2 3

Original cost of asset $1,400 $1,400 $1,400

Accumulated depreciation 400 400 400

Carrying amount of the asset $1,000 $1,000 $1,000

Recoverable amount 1,500 1,500 900

a. Impaired? No No Yes

The recoverable amount is the higher between the value in use (present value of future net cash inflows) and the net fair value. The impairment test involves a comparison of the carrying amount of the asset with the recoverable amount. If the recoverable amount is less than the carrying amount, then the asset is impaired.

b. Amount to be reported? $1,000 $1,000 $900

If the asset is not impaired, then it continues to be reported at its carrying amount, as in Scenarios 1 and 2. If the asset is impaired, as in Scenario 3, then it is reported at its recoverable amount.

2. Impairment Loss 100

Accumulated Impairment Losses 100

*To record loss on impairment of asset.*

### E 9–17 (LO6) Asset Impairment

The impaired value of the land and building must be recognized. The journal entry on January 1, 2018, would be:

Impairment Loss, Land ($150,000 *–* $50,000) 100,000

Impairment Loss , Building ($400,000 *–* $70,000) 330,000

Accumulated Impairment Losses, Land 100,000

Accumulated Impairment Losses, Building 330,000

*To record loss on impairment of land and building.*

### E 9–18 (LO8) Disposal of an Asset

1. Cash 42,000

Accumulated Depreciation, Truck 22,500

Truck 60,000

Gain on Sale of Truck 4,500

*Sold truck at a gain (Accumulated depreciation =*

*$60,000/8 = $7,500; $7,500 × 3 = $22,500).*

2. Cash 35,000

Accumulated Depreciation, Truck 22,500

Loss on Sale of Truck 2,500

Truck 60,000

*Sold truck at a loss.*

3. Accumulated Depreciation, Truck 22,500

Loss on Disposal of Truck 37,500

Truck 60,000

*Scrapped truck.*

### E 9–19 (LO8) Disposal of an Asset

1. Cash 97,000

Accumulated Depreciation, Machine\* 27,000

Machine 115,000

Gain on Sale of Machine 9,000

*Sold machine.*

 = $13,500 per year; $13,500 × 2 = $27,000

2. Cash 36,000

Accumulated Depreciation, Machine\* 67,500

Loss on Sale of Machine 11,500

Machine 115,000

*Sold machine.*

\*$13,500 × 5 = $67,500

E 9-20(LO8) Accounting for Disposal of Equipment

(a) Cash 56,000

Accumulated Depreciation—Equipment

 [($100,000 –$16,000) X 3/5] 50,400

Equipment 100,000

Gain on Disposal of Plant Assets 6,400

(b) Depreciation Expense

 [($100,000 –$16,000) X 1/5 X 4/12] 5,600

Accumulated Depreciation—Equipment 5,600

Cash 56,000

Accumulated Depreciation—Equipment

 ($50,400 + $5,600) 56,000

Equipment 100,000

Gain on Disposal of Plant Assets 12,000

(c) Cash 22,000

Accumulated Depreciation—Equipment 50,400

Loss on Disposal of Plant Assets 27,600

Equipment 100,000

(d) Depreciation Expense

 [($100,000 –$16,000) ÷ 5 X 9/12] 12,600

Accumulated Depreciation—Equipment 12,600

Cash 22,000

Accumulated Depreciation—Equipment

 ($50,400 + $12,600) 63,000

Loss on Disposal of Plant Assets 15,000

Equipment 100,000

### E 9–21 (LO9) Accounting for Intangible Assets

1. Journal entries

Amortization Expense, Patent 9,100

Patent 9,100

*To record amortization expense on the patent for*

*2018 ($182,000/20 years = $9,100 per year).*

Goodwill is not amortized.

2. Partial balance sheet

Cervantes Labs, Inc.

Partial Balance Sheet

December 31, 2018

Intangible assets:

Goodwill $ 26,000

Patent (cost $182,000) 109,200

Total intangible assets $135,200

Computations:

Patent: $9,100 × 8 years = $72,800; $182,000 – $72,800 = $109,200

### E 9–22 (LO9) Intangible Assets

1. 2018

Jan. 1 Patent 250,000

Cash 250,000

*To record purchase of a patent.*

2. 2018

Dec. 31 Amortization Expense, Patent 12,500

Patent 12,500

*To record amortization expense of patent*

*($250,000 ÷ 20 years).*

3. Goodwill is never amortized. Each year, goodwill would be evaluated to ensure that the amount recorded on the books of the company is not overstated. If goodwill is overstated, then it could be written down based on the results of impairment tests.

### E 9–23 (LO9) Computing Goodwill

1. The assets will be recorded at their fair values as follows:

Cash £ 30,000

Accounts receivable 300,000

Inventory 600,000

Property, plant, and equipment 900,000

2. Liabilities will be recorded on Stringtown’s books at £400,000.

3. The market value of the net assets acquired is £1,430,000 (£1,830,000 –£400,000). The excess purchase price is £370,000 (£1,800,000 –£1,430,000), which must be allocated to goodwill.

Goodwill will be recorded at £370,000.

### E 9–24 (LO10) Fixed Asset Turnover

2018 2017

Land $ 350,000 $ 310,000

Buildings 740,000 680,000

Equipment 140,000 120,000

Total property, plant, and equipment $1,230,000 $1,110,000

Fixed asset turnover = Sales/Average fixed assets

= $3,650,000/[($1,230,000 + $1,110,000)/2] = 3.12

## PROBLEMS

**P9-1(LO2) Determining Acquisition Costs of Land and Building**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Item** |  | **Land** |  | **Buildings** |  | **Other Accounts** |
|  |  |  |  |  |  |  |
| **1**  **2**  **3**  **4**  **5**  **6**  **7**  **8**  **9**  **10** |  | **$ 13,200**  **290,000**  **5,600**  **30,000**  **(7,200)**  **($331,600)** |  | **$1,560,000**  **70,000**  **20,500**    **$1,650,500** |  | $**10,000  Property Taxes Expense**  **28,000  Land Improvements** |

### P 9–2 (LO3) Accounting for Natural Resources

1. Oil Well 2,000,000

Cash 2,000,000

*Purchased oil well on May 31, 2017.*

2. Depletion Expense 160,000

Accumulated Depletion, Oil Well 160,000

*To record depletion expense (at $10 per barrel) on*

*the oil well for 2017.*

3. Depletion Expense 210,000

Accumulated Depletion, Oil Well 210,000

*To record depletion expense (at $10 per barrel) on*

*the oil well for 2018.*

### P 9–3 (LO3) Financial Statement Effects of Depreciation Methods

1.

Straight- Double-Declining-

Line Balance

2017 (1/2 year) $10,000 $24,000

2018 20,000 38,400

2019 20,000 23,040

Totals (2017–2019) $50,000 $85,440

*Computations:*

Straight-line depreciation: ($120,000 – $20,000)/5 = $20,000 per year

Double-declining-balance: 1/5 × 2 = 40% rate

2017: $120,000 × 40% × 1/2 = $24,000

2018: ($120,000 – $24,000) × 40% = $38,400

2019: ($120,000 – $24,000 – $38,400) × 40% = $23,040

2. Carrying amounts at end of 2019:

Straight-line: $120,000 – $50,000 = $70,000

Double-declining-balance: $120,000 – $85,440 = $34,560

3. The straight-line method produces the lowest depreciation from 2017 to 2019, and the double-declining-balance method results in the highest amount of depreciation. Therefore, net income would be highest using the straight-line method and lowest using the double-declining-balance method.

### P 9–4 (LO3) Depreciation Calculations

1. Straight-line method:

 = $4,500 per year

Year Depreciation Expense Carrying Amount

2017 $4,500 × 2/3 year = $3,000 $47,000 – $3,000 = $44,000

2018 $4,500 44,000 – 4,500 = 39,500

2. Units-of-production method:

 = $1.80 per hour × 1,800 hours = $3,240

 = $1.80 per hour × 2,900 hours = $5,220

Year Depreciation Expense Carrying Amount

2017 $3,240 $47,000 – $3,240 = $43,760

2018 $5,220 43,760 – 5,220 = 38,540

3. The straight-line method would be used in order to report the highest income in 2017 and 2018 combined. Because straight-line depreciation provides the smallest amount of depreciation expense in early years, net income would be higher with this method than with the others.

### P 9–5 (LO2, LO3) Acquisition of an Asset

1. Invoice price $184,250

Discount 3,685

Net purchase price $180,565

Delivery 3,000

Insurance 1,200

Installation 3,400

Start-up costs 655

Total cost $188,820

2. Additional information needed in order to compute the first year’s depreciation expense would be:

Depreciation method to be used

Salvage value of the press

Estimated life of the press

3. The relevant criterion is that all costs incurred to get an asset ready for its intended use should be included in the total cost of the asset. If the start-up costs represent testing or getting the machine in working order, they should be included. If they represent the first production of salable products, they should not be included.

### P 9–6 (LO2, LO3) Purchase of Multiple Assets for a Single Sum

1. Purchase price $210,000

*Market values:*

Land $ 70,000

Building 120,000

Equipment 60,000

Total $250,000

Allocate cost to assets based on relative fair market values:

Cost of land: $70,000/$250,000 × $210,000 = $ 58,800

Cost of building: $120,000/$250,000 × $210,000 = 100,800

Cost of equipment: $60,000/$250,000 × $210,000 = 50,400

$210,000

2. Land 58,800

Building 100,800

Equipment 50,400

Cash 210,000

*Purchased assets for a single sum, with cost allocated*

*based on fair market values.*

3. Land 12,000

Building 14,000

Equipment 3,500

Cash 29,500

*Incurred and paid expenditures to clear the land title,*

*landscape, repair the equipment, and renovate the building.*

4. 2018

Dec. 31 Depreciation Expense 9,705

Accumulated Depreciation, Building 3,930

Accumulated Depreciation, Equipment 5,775

*To record depreciation expense for 2018.*

Building:  × 3/4 year = $3,930

Equipment:  × 3/4 year = $5,775

### P 9–7 (LO2, LO3) Basket Purchase and Partial-Year Depreciation

Fair Market Allocated

1. Asset Value Percentage Cost Cost

Land $ 75,000 33.3333% × $200,000 = $ 66,667

Building 100,000 44.4444 × 200,000 = 88,889

Equipment 50,000 22.2222 × 200,000 = 44,444

Totals $225,000 $200,000

Land 66,667

Building 88,889

Equipment 44,444

Cash 200,000

*Purchased assets as a group and allocated the single-*

*sum cost among the assets based on relative fair mar-*

*ket values.*

2. Depreciation of assets:

Building:  = $4,444 × 3/4 = $3,333

Equipment:  = $8,889 × 3/4 = $6,667

### P 9–8 (LO3, LO4, LO5) Changes in Depreciation Estimates and Capitalization of Expenditures

1. a. 2017

Jan. 2 Machine 76,600

Cash 76,600

*Purchased a machine for cash.*

b. 2017

Dec. 31 Depreciation Expense 19,150

Accumulated Depreciation, Machine 19,150

*To record depreciation expense for 2017*

*[1/8× 2 = 0.25]*

*[$76,600 × 0.25 = $19,150].*

2018

Dec. 31 Depreciation Expense 14,363

Accumulated Depreciation, Machine 14,363

*To record depreciation expense for 2018*

*[($76,600 - $19,150) × 0.25 = $14,363].*

c. 2019

Dec. 31 Depreciation Expense 21,544

Accumulated Depreciation, Machine 21,544

*To record depreciation expense for 2019 after*

*change in estimates.*

Cost of machine $76,600

Depreciation, 2017 and 2018 33,513

Carrying amount at January 1, 2019 $43,087

1/4× 2 = 0.5

Depreciation = 0.5 × $43,087 = $21,544

d. 2020

Jan. 2 Machine 34,000

Cash 34,000

*To record the cost of major repairs that*

*increased machine’s useful life by two years*

*and increased its salvage value to $3,000.*

e. 2020

Dec. 31 Depreciation Expense 22,217

Accumulated Depreciation, Machine 22,217

*To record depreciation expense for 2020.*

Carrying amount at January 1, 2019 $43,087

Depreciation for 2019 21,544

Carrying amount at January 1, 2020 $21,543

Cost of major repairs in 2020 34,000

Carrying amount after major repairs $55,543

Remaining estimated life:

3 years (before repairs) + 2 additional years = 5 years

1/5× 2 = 0.4

Depreciation = 0.4 × $55,543 = $22,217

2. Carrying amount at December 31, 2020: $55,543 – $22,217 = $33,326

### P 9–9 (LO3, LO4, LO5) Unifying Concepts: Accounting for Natural Resources

1. a. 2017

Jan. 1 Timber Tract 800,000

Cash 800,000

*Purchased timber tract.*

2018

Jan. 1 Silver Mine 600,000

Cash 600,000

*Purchased silver mine.*

2018

July 1 Uranium Mine 60,000

Cash 60,000

*Purchased uranium mine.*

2019

Jan. 1 Oil Well 500,000

Cash 500,000

*Purchased oil well.*

b. (1) Depletion Expense 100,000a

Accumulated Depletion, Timber Tract 100,000

(2) Depletion Expense 100,000b

Accumulated Depletion, Silver Mine 100,000

(3) Depletion Expense 12,000c

Accumulated Depletion, Uranium Mine 12,000

(4) Depletion Expense 50,000d

Accumulated Depletion, Oil Well 50,000

*To record the depletion expense on all*

*natural resources for 2019.*

Calculations:

a  = $0.50 per foot; 200,000 board feet × $0.50 = $100,000

b  = $20 per ton; 5,000 tons × $20 = $100,000

c  = $12 per ton; 1,000 tons × $12 = $12,000

d  = $5 per barrel; 10,000 barrels × $5 = $50,000

2. Total depletion before 2020: 20,000 tons

× $20 per ton

$400,000

Cost $600,000

Depletion 400,000

Remaining $200,000 ÷ 4,000 tons = $50 per ton

2020

Dec. 31 Depletion Expense 100,000

Accumulated Depletion, Silver Mine 100,000

*To record depletion expense on the silver*

*mine—2,000 tons at $50 per ton.*

### P 9–9 (LO3, LO4, LO5) (Continued)

3. Carrying amounts

Carrying

Resources Cost Total Depletion Amount

a. Timber $800,000 800,000 × $ 0.50 = $400,000 $400,000

{

20,000 × $20.00 = 400,000

2,000 × $50.00 = 100,000

b. Silver 600,000 100,000

c. Uranium 60,000 3,000 × $12.00 = 36,000 24,000

d. Oil 500,000 80,000 × $ 5.00 = 400,000 100,000

### P 9–10 (LO6) Asset Impairment

1. According to IFRS, first of all, the company has to judge if there is any indication for impairment. The factory in this example shows indication of impairment. Then, Delta Company has to estimate the recoverable amount, which is the higher value between the value in use (the present value of future net cash inflows) and the net fair value. If the recoverable amount is less than the carrying amount of the asset, the asset is impaired.

2. The value in use is $2,000,000. The net fair value is $1,300,000. Thus, the recoverable amount is $2,000,000. The recoverable amount is less than the $2,400,000 carrying amount of the factory, so an impairment loss should be recognized.

The factory must be written down to its fair value. The necessary journal entry is as follows:

Impairment Loss 400,000

Accumulated Impairment Losses 400,000

*To record asset impairment of Lagos factory.*

### P 9–11 (LO2, LO3, LO8) Acquisition, Depreciation, and Disposal of Assets

1. Cost of building: $420,000/$600,000 = 0.70

$580,000 × 0.70 = $406,000

Cost of land: $180,000/$600,000 = 0.30

$580,000 × 0.30 = $174,000

a. 2018

Jan. 2 Building 406,000

Land 174,000

Cash 580,000

*Purchased land and building.*

b. 2018

Dec. 31 Depreciation Expense 15,040

Accumulated Depreciation, Building 15,040

*To record depreciation expense on the*

*building for 2018 [($406,000 – $30,000)/25*

*years = $15,040].*

2. Cash 470,000

Accumulated Depreciation, Building 60,160

Loss on Sale of Building and Land 49,840

Building 406,000

Land 174,000

*Sold property at a loss.*

Calculation of loss:

Original cost $580,000

Less accumulated depreciation ($15,040 × 4 years) 60,160

Carrying amount $519,840

Less sales price 470,000

Loss $ 49,840

### P 9–12 (LO2, LO3, LO8) Acquisition, Depreciation, and Sale of an Asset

1. 2017

Jan. 2 Airplane 114,000

Cash 114,000

*Purchased airplane ($112,000 – $3,000 + $4,000*

*+ $1,000).*

2. Units-of-production method

 = $58 per hour; $58 × 300 hours = $17,400

3. 2020

July 1 Depreciation Expense 8,500

Accumulated Depreciation, Airplane 8,500

*To record depreciation expense for the period*

*from January 1, 2020, to July 1, 2020, bringing*

*depreciation up to date before recording the*

*sale of the airplane ($17,000 × 1/2 year).*

*Note*: No depreciation has yet been recorded for 2020, which is now recorded   
by this entry ($90,000 – $5,000) × 1/5 × 1/2 year = $8,500.

July 1 Cash 40,000

Accumulated Depreciation, Airplane 59,500

Airplane 90,000

Gain on Sale of Airplane 9,500

*Sold airplane for $40,000 cash on July 1, 2020.*

### P 9–13(LO2, LO3, LO8) Acquisition, Depreciation, and Sale of an Asset

1. a. 2017

July 1 Truck 6,100

Cash 6,100

*Purchased truck ($5,300 + $800).*

b. 2017

Dec. 31 Depreciation Expense 950

Accumulated Depreciation, Truck 950

*To record depreciation expense on the truck*

*for 2016 [($6,100 cost – ($450-$50) net salvage value)*

*÷ 3 years = $1,900; $1,900 × 1/2 year = $950].*

c. 2018

Dec. 31 Depreciation Expense 1,900

Accumulated Depreciation, Truck 1,900

*To record depreciation expense on the truck*

*for 2017.*

d. 2019

Jan. 2 Cash 2,600

Accumulated Depreciation, Truck 2,850

Loss on Sale of Truck 650

Truck 6,100

*Sold truck for $2,600 cash.*

2.  × 8,000 miles = $1,140

3. The loss of $650 in part (1)d occurred because the carrying amount of the truck at the date of sale was $3,250 ($6,100 – $2,850), which was higher than the sale price of $2,600. This shows that depreciation is not a method of valuation but rather a process of allocating an asset’s cost over its life. In this case, the market and carrying amounts of the truck were significantly different because the original estimates of useful life and salvage value were not totally accurate.

### P 9–14 (LO3, LO8) Depreciation Calculations

1. a. Straight-line method:

 = $18,750 per year

b. Units-of-production method:

 = $0.833 per unit

$0.833 × 25,000 units = $20,825

2. $79,000 – $18,750 = $60,250

3. Sale price $20,000

Original cost $79,000

Less depreciation ($18,750 × 3 years) 56,250

Carrying amount 22,750

Loss $ (2,750)

### P 9–15 (LO9) Accounting for Intangible Assets (Goodwill)

2018

Jan. 1 Inventory 70,000

Building 130,000

Land 90,000

Accounts Receivable 30,000

Goodwill 20,000

Accounts Payable 15,000

Cash 325,000

*Purchased assets and liabilities of Immensity Company.*

### P 9–16 (LO9) Accounting for Goodwill

1. The trademark will be recorded at $2,000,000, the fair market value of the trademark on the date of the acquisition.

2. The fair market value of the net assets is $1,700,000 ($5,700,000 – $4,000,000). The excess purchase price is $7,100,000 ($8,800,000 – $1,700,000), which must be allocated to goodwill.

Goodwill will be recorded at $7,100,000.

3. Skull Valley’s recorded equity immediately before the acquisition was a negative $950,000 ($3,050,000 assets – $4,000,000 liabilities). In this case, the value of Skull Valley stemmed from its $2 million trademark and $7.1 million in goodwill, both of which were not reported at all because Skull Valley had developed the assets itself. Book value of stockholders’ equity is a poor measure of the fair value of a company when the company has many unrecorded intangible assets.

P 9-17 (LO10) Calculating and Commenting on Asset Turnover

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| (a) |  |  | Champagne |  | Ardenne |
|  |  |  |  |  |  |
|  | Asset turnover |  | = .62 times |  | = .74 times |

(b) Based on the asset turnover, Ardenne is more effective in using assets to generate sales. Its asset turnover is more than 19% higher than Champagne’s ratio.

### P 9–18 (LO10) Fixed Asset Turnover Ratio

1. 2018 2017

Land $ 300,000 $ 200,000

Buildings 800,000 600,000

Equipment 400,000 300,000

Total cost $1,500,000 $1,100,000

Fixed asset turnover: $4,000,000/[($1,500,000 + $1,100,000)/2] = 3.08

2. Fair value of fixed assets: Fair value of total assets – Cash – Accounts   
receivable – Inventory (at fair value) = Fair value of fixed assets

*Note:* The fair value adjustments for the inventory relate to current assets instead of long-term assets. Also, it is reasonable to assume that the fair value of cash and accounts receivable are close to their carrying amounts.

2018: $3,500,000 – $40,000 – $500,000 – $700,000 – $100,000 = $2,160,000

2017: $2,500,000 – $30,000 – $400,000 – $500,000 – $50,000 = $1,520,000

Fixed asset turnover: $4,000,000/[($2,160,000+ $1,520,000)/2] = 2.17

3. It is difficult to tell whether Waystation is more or less efficient than Handy Corner at using its fixed assets. Based on the reported financial numbers, Waystation’s fixed asset turnover is 3.08 whereas the ratio for Handy Corner is only 2.8. However, as shown in part (2), this difference may be because of a difference between carrying amount and fair value of reported long-term assets. If Handy Corner has relatively new fixed assets, for which the carrying amount is quite close to the fair value, then Waystation’s 2.17 fixed asset turnover ratio, based on fair values, is worse than the 2.8 ratio value for Handy Corner.

## ANALYTICAL ASSIGNMENTS

AA 9–1 Intangible Assets

Discussion

Goodwill can be recorded only when purchased. If the management of Renford Company believes that the Tacoma restaurant is failing, it should perform a goodwill impairment test to see whether it needs to write down goodwill for that restaurant. Recognizing goodwill on the Seattle restaurant’s books is not allowed.

AA 9–2 TSMC

Real Company Analysis

**1.** Using the information about the estimated service lives above and information in note 15, we can approximately estimate how old is the company’s property, plant, and equipment. (Since TSMC didn’t mention the proportion of land equipment in “Land and Land Equipment”, we couldn’t calculate how old the land equipment is.)

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **(Units: thousands of NT$)** | |
|  | Balance at cost, December 31, 2015 | estimated  service lives  (in average) | depreciation  expense per year |
| **Buildings** | $296,801,864 | 12.5 | $23,744,149 |
| **Machinery and equipment** | 1,893,489,604 | 3.5 | 540,997,030 |
| **Office equipment** | 30,700,049 | 9 | 3,411,116 |
| **Leased assets** | 7,113 | 20 | 356 |

Buildings: $157,910,155/$23,744,149 = 6.7 years

Machinery and equipment: $1,385,857,655/$540,997,030 = 2.6 years

Office equipment: $19,426,069/$3,411,116 = 5.7 years

Leased assets: $7,113/$356 = 20 years

## EXPANDED MATERIALS

## Discussion Questions

**18.** Companies can record a gain or loss on the exchange when the exchanges have commercial substance. An exchange has commercial substance if the future cash flows change as a result of the exchange. Because the timing and amount of cash flows generated from the use of assets will change; and therefore, the exchange has commercial substance, and the companies recognize a gain or loss in the exchange.

**19.** The measurement of the fair value needs estimation, and it is less reliable because the estimation sometimes depends on experience and judgments. Moreover, the management might manipulate the earnings due to the estimation of the fair value.

## Exercises

### E 9-25 (LO11) Recording Exchange of Property, Plant and Equipment

Machine B (NT$250,000 + NT$100,000) 350,000

Accumulated Depreciation, Machine A 520,000

Loss on Disposal of Machine (NT$250,000 - NT$480,000) 230,000

Machine A 1,000,000

Cash 100,000

***To record exchange of used machine for a new machine***

### E 9-26 (LO11) Recording Exchange of Property, Plant and Equipment

Truck (New) (NT$50,000 + NT$350,000) 400,000

Accumulated Depreciation, Truck (Old) 500,000

Truck (Old) 800,000

Gain on Disposal of Truck (NT$350,000-NT$300,000) 50,000

Cash 50,000

***To record exchange of used machine for a new machine***

### E 9-27(LO12) Determining the Revaluation Surplus

Accumulated Depreciation-Machine 50,000

Machine 30,000

Revaluation surplus 20,000

***To record adjusting the machine to fair value.***

### E 9-28(LO12) Determining the Revaluation Surplus

**(a) January 1, 2017**

Equipment 60,000

Cash 60,000

**December 31, 2017**

Depreciation Expense 10,000

Accumulated Depreciation, Equipment 10,000

**(b) December 31, 2018**

Depreciation Expense 10,000

Accumulated Depreciation, Equipment 10,000

Accumulated Depreciation, Equipment 20,000

Equipment 10,000

Revaluation Surplus 10,000

## SOLUTIONS TO “STOP & THINK”

***Stop & Think (p. 377):*** Do you think businesses would prefer an impairment test involving only the comparison of the carrying amount of an asset to its net fair value? Explain.

According to IAS 16, a company should perform an impairment test by comparing the carrying amount of the asset with its recoverable amount. The recoverable amount of an asset is the higher of net fair value of the asset or value in use of the asset, and that’s why it is called two-step impairment test. If a company uses the one-step impairment test, it would directly compare the carrying amount with the net fair value. Companies would not prefer this approach since it may cause more impairment losses to be recorded. For example, if the amount of value in use is higher than the net fair value, a company would recognize more impairment loss if it only compares the carrying amount with the net fair value. As another example, if the amount of value in use is higher than the carrying amount, but the net fair value is lower than the carrying amount, the carrying amount of the asset would remain under the two-step impairment test. But if the company only compares the carrying amount with the net fair value, it would have to recognize impairment loss.