CHAPTER 3

MEASUREMENT

Learning Objectives

|  |
| --- |
| 1. Use valuation techniques to measure financial statement elements. |
| 1. Use IFRS 13 to measure fair value. |
| 1. Understand and apply present value concepts. |
| 1. Identify differences in accounting between ASPE and IFRS, and what changes are expected in the near future. |

Summary of Questions by Learning Objectives and Bloom’s Taxonomy

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Item** | **LO** | **BT** | **Item** | **LO** | **BT** | **Item** | **LO** | **BT** | | **Item** | **LO** | **BT** | | **Item** | **LO** | **BT** |
| **Brief Exercises** | | | | | | | | | | | | | | | | |
| 1. | 1 | C | 7. | 1 | AP | 13. | 3 | | AP | 19. | 3 | | AP | 25. | 3 | AP |
| 2. | 1 | C | 8. | 1 | AP | 14. | 3 | | AP | 20. | 3 | | AP | 26. | 3 | AP |
| 3. | 1 | C | 9. | 1 | AP | 15. | 3 | | AP | 21. | 3 | | AP | 27. | 3 | AP |
| 4. | 1 | C | 10. | 2,4 | C | 16. | 3 | | AP | 22. | 3 | | AP | 28. | 3 | AP |
| 5 | 1 | C | .11. | 2,4 | C | 17. | 3 | | AP | 23. | 3 | | AP | 29. | 3,4 | AP |
| 6. | 1 | AP | 12. | 3 | AP | 18. | 3 | | AP | 24. | 3 | | AP |  |  |  |
| **Exercises** | | | | | | | | | | | | | | | | |
| 1. | 1 | AP | 3. | 3 | AP | 5. | 3 | | AP | 7. | 3 | | AP | 9. | 1,3 | AP |
| 2. | 2 | AP | 4. | 3 | AP | 6. | 3 | | AP | 8. | 3 | | AP | 10. | 1,3 | AP |
| **Problems** | | | | | | | | | | | | | | | | |
| 1. | 1,3 | AP | 3. | 2 | C | 5. | 1,3 | | AP | 7. | 1,3 | | AP | 9. | 1,3 | AP |
| 2. | 1,3 | AP | 4. | 1,3 | AP | 6. | 1,3 | | AP | 8. | 1,3 | | AP |  |  |  |
| **Cases** | | | | | | | | | | | | | | | | |
| 1. | 1,2 | C | 2. | 1,2 | C |  |  | |  |  |  | |  |  |  |  |
| **Research and Analysis** | | | | | | | | | | | | | | | | |
| 1. | 1,2 | K | 2. | 1,2 | C | 3. | 4 | | C | 4. | 4 | | C |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Legend**:** The following abbreviations will appear throughout the solutions manual file. | | | |
|  |  |  |  |
| LO | Learning objective | |  |
| BT | Bloom's Taxonomy | |  |
|  | K | Knowledge |  |
|  | C | Comprehension | |
|  | AP | Application |  |
|  | AN | Analysis |  |
|  | S | Synthesis |  |
|  | E | Evaluation |  |
| Difficulty: | Level of difficulty | |  |
|  | S | Simple |  |
|  | M | Moderate |  |
|  | C | Complex |  |
| Time: | Estimated time to complete in minutes | | |
| AACSB | Association to Advance Collegiate Schools of Business | | |
|  | Communication | | Communication |
|  | Ethics | | Ethics |
|  | Analytic | | Analytic |
|  | Tech. | | Technology |
|  | Diversity | | Diversity |
|  | Reflec. Thinking | | Reflective Thinking |
| CPA CM | CPA Canada Competency Map | | |
|  | Ethics | | Professional and Ethical Behaviour |
|  | PS and DM | | Problem-Solving and Decision-Making |
|  | Comm. | | Communication |
|  | Self-Mgt. | | Self-Management |
|  | Team & Lead | | Teamwork and Leadership |
|  | Reporting | | Financial Reporting |
|  | Stat. & Gov. | | Strategy and Governance |
|  | Mgt. Accounting | | Management Accounting |
|  | Audit | | Audit and Assurance |
|  | Finance | | Finance |
|  | Tax |  | Taxation |

**ASSIGNMENT CHARACTERISTICS TABLE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item |  | Description | Level of Difficulty | Time  (minutes) |
| E3.1 |  | Discounted cash flow models | Moderate | 25-30 |
| E3.2 |  | Fair value estimate | Complex | 20-25 |
| E3.3 |  | Unknown rate | Complex | 35-40 |
| E3.4 |  | Unknown rate | Moderate | 15-20 |
| E3.5 |  | Evaluation of purchase options | Moderate | 15-20 |
| E3.6 |  | Analysis of alternatives | Moderate | 15-20 |
| E3.7 |  | Calculation of bond liability | Moderate | 15-20 |
| E3.8 |  | Calculation of amount of lease payments | Complex | 15-20 |
| E3.9 |  | Expected cash flows | Simple | 10-15 |
| E3.10 |  | Expected cash flows and present value | Simple | 10-15 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | |  | |  | |  | |
| P3.1 |  | | Lease obligation with incentive | | Complex | | 50-60 | |
| P3.2 |  | | Options financing asset purchase | | Complex | | 50-60 | |
| P3.3 |  | | Fair value principle under IFRS 13 | | Moderate | | 45-50 | |
| P3.4 |  | | Buy or lease option | | Complex | | 45-50 | |
| P3.5 |  | | Buy or lease option | | Moderate | | 40-45 | |
| P3.6 |  | | Financing asset purchase | | Moderate | | 40-45 | |
| P3.7 |  | | Buy or lease option | | Moderate | | 30-35 | |
| P3.8 |  | | Buy or lease option | | Moderate | | 30-35 | |
| P3.9 |  | | Buy or lease option | | Moderate | | 30-35 | |
|  |  | |  | |  | |  | |

**SOLUTIONS TO BRIEF EXERCISES**

**BRIEF EXERCISE 3.1**

|  |  |  |
| --- | --- | --- |
| **ELEMENT** | **BASIS OF MEASUREMENT** | **MEASUREMENT CATEGORIZATION** |
| **Building** | **Depreciated cost unless impaired** | **Hybrid measure – cost-based in general, but impairment requires current value measures** |
| **Manufacturing inventory** | **Lower of cost and net realizable value** | **Hybrid measure – cost-based in general, but assessment of NRV requires current value measures** |
| **Biological assets** | **Fair value less (estimated) costs to sell** | **Current value measure** |
| **Bonds payable** | **Amortized cost** | **Cost-based measure** |

LO 1 BT: C Difficulty: M Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.2**

**The two common types of valuation techniques/models are:**

**1. Market models: These techniques use prices and other information generated from market transactions involving identical or similar transactions. An example is the earnings multiples model. Under this example, an investment in a privately owned company may be valued using publicly available earnings numbers for similar companies as well as multiples that are generated by comparing publicly available earnings numbers with share prices.**

**2. Income models: These techniques convert future amounts (such as future cash flows to be generated by an asset) to current amounts. Examples include discounted cash flows and option pricing models. Both use present value concepts.**

LO 1 BT: C Difficulty: M Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.3**

**Present value techniques for measuring assets:**

1. **Non-current notes receivable at unfairly low or zero interest rate receivable**
2. **Investments in bonds at amortized cost where the contractual and market rates are different**
3. **Assets acquired using financing structured as leases**
4. **Impairment of PPE when estimating value in use (in IFRS; ASPE uses the undiscounted cash flows to determine recoverable amount).**
5. **Assets acquired under deferred payment contracts**

**Present value techniques for measuring liabilities:**

1. **Bonds payable when the contractual and market rates are different**
2. **Lease obligations**
3. **Non-current notes payable at unfairly low or zero interest rate payable**
4. **Pension liabilities and obligations**
5. **Asset retirement obligations**

**(Note to instructor – there may be additional items)**

LO 1 BT: C Difficulty: M Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.4**

**The two approaches that are generally accepted using the discounted cash flow model are:**

1. **Traditional approach: The discount rate reflects all risks in the cash flows but the cash flows are assumed to be certain. This is sometimes referred to as the “discount rate adjustment technique.”**
2. **Expected cash flow approach: A risk-free discount rate is used to discount cash flows that have been adjusted for uncertainty. This is sometimes referred to as the “expected present value technique.”**

LO 1 BT: C Difficulty: M Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.5**

**The $1,000 face value of the bond is not used to record the liability. The inputs or variables used in the measurement of the initial recording of the bond payable include:**

1. **The amounts of future cash flows of the principal, in this case of $1,000 ten years from today and the annuity of annual interest payments of $40 ($1,000 x 4%) for ten years.**
2. **The time value of money is dictated by what the market expects from lending money to the business. In this case the market rate is 5%.**
3. **Any uncertainty or risk associated with the ability of the business to meet its future payment obligations under the bond contract.**

**I would recommend using the traditional approach to account for the discounted cash flows since the payments are specified in the bond agreement. This approach is a better fit with the terms of the formal contract required to issue bonds.**

LO 1 BT: AP Difficulty: S Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.6**

**Scenario 1: Cash flows are fairly certain**

**When the cash flows are fairly certain, the traditional approach works well. Under this approach, the stream of cash flows is discounted at a rate that reflects the riskiness of the cash flows. Therefore, the 6% rate would be used. The present value would be determined as follows:**

**PV of an annuity for 5 years at 6% = $421.24\***

**\*using the PV factor of 4.21236 for an ordinary annuity at 6%**

**Scenario 2: Cash flows are uncertain**

**When the projected cash flows are uncertain in timing or amount, the expected cash flow method works best. Under this approach, a risk-free rate is used to discount cash flows, which have been adjusted for associated uncertainties. This approach is more flexible when the cash flows vary over the term. The present value would be determined as follows:**

**PV of [(25% X $75) + (75% X $100)] at 3% in five years**

**PV of $93.75 at 3% in five years = $80.87 \*\***

**\*\* using PV factor of .86261**

LO 1 BT: AP Difficulty: S Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.7**

**For the impairment test, use the tables for single payments to determine the present value of the future cash flows at the discount rate of 10%:**

|  |  |
| --- | --- |
| **Year 1 ($35,000 × 0.90909) =** | **$ 31,818.15** |
| **Year 2 ($45,000 × 0.82645) =** | **37,190.25** |
| **Year 3 ($55,000 × 0.75132) =** | **41,322.60** |
| **Present value of future cash flows** | **$110,331.00** |

LO 1 BT: AP Difficulty: S Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

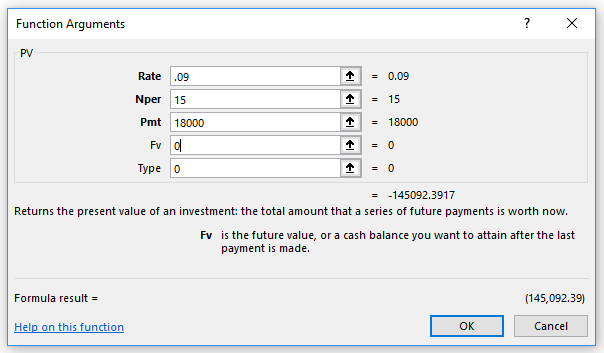
**BRIEF EXERCISE 3.8**

**(a) To determine the present value of the future cash inflows from selling the use of the technology, use the annuity tables for a discount rate of 9% and a time period of 15 years.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Using PV tables:**  **Present value of the payments** | | |  |
| **$18,000 X 8.06069** | | | **$145,092.42** |
|  | | |  |
| **(b) Using a financial calculator:** |

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields - $145,092.39** |
| **I** | **9%** |
| **N** | **15** |
| **PMT** | **$18,000** |
| **FV** | **$ 0** |
| **Type** | **0** |

|  |
| --- |
| **(c) Using Excel: =PV(rate,nper,pmt,fv,type)** |



**Result: ($145,092.39)**

LO 1 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.9**

The **probability-weighted expected value of the residual guarantee must be used in the present value calculation of the lease payments liability.**

P**robability-weighted expected value**

$16,000 X 50% = $8,000

$12,000 X 30% = 3,600

$**10,000 X 20% = 2,000 $13,600**

LO 1 BT: AP Difficulty: S Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.10**

1. **How the item could be/is used:**

**The highest and best use concept values the asset based on the highest value that the market would place on the asset considering all possible uses that are physically possible, legally permissible, and financially feasible. The company must consider the highest and best use in the market regardless of how it is actually using the building.**

1. **The market:**

**This measurement would consider the value based on the market that the entity normally buys and sells in, referred to as the principal market. This is usually also the most advantageous market.**

1. **The valuation technique/model:**

**Because of the nature of the property, the transactions of purchase and sale are infrequent. Consequently, this affects the liquidity of the asset being measured. In this case, the income stream coming from rental revenue would be a strong basis for the determination of the market value of the building. This method would be an income model.**

**Although ASPE provides little specific guidance (i.e., no fair value hierarchy), the above analysis could also be used under ASPE.**

LO 2,4 BT: C Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.11**

1. **Level 3 is the least reliable level since much judgement is needed based on the best information available. This often includes management’s judgement about how the markets would value the asset.**
2. **Level 1 inputs provide the most reliable fair values because these inputs are based on quoted prices in an active market for the exact same item.**
3. **Level 2 considers evaluating similar assets or liabilities in active markets or using observable inputs such as interest rates or exchange rates.**

**ASPE does not introduce the concept of a fair value hierarchy.**

LO 2,4 BT: C Difficulty: M Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

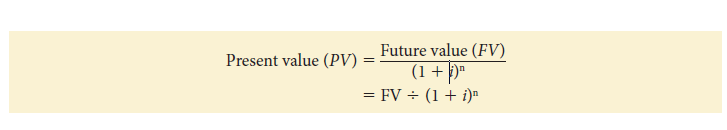
**Brief Exercise 3.12**

|  |  |
| --- | --- |
| **a. $5.00** | **($100 × 5%)** |
| **b. $60.00** | **($500 × 6% × 2 periods)** |
| **c. $61.80** | **($500 × 6%) + ($530 × 6%)** |

LO 3 BT: AP Difficulty: S Time: 10 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.13**

**(a) Using formulas:**

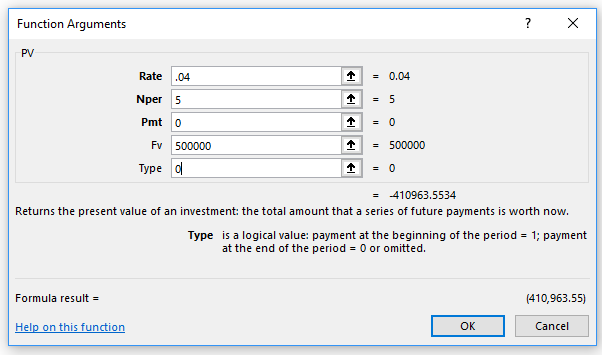


|  |  |  |
| --- | --- | --- |
| **Formula for the single payment:**  **In applying this formula to calculate the present value (PV), the future value (FV) of $500,000, the interest (discount) rate (i) of 4%, and the number of periods (n) of 5 are used as follows:**  **PV = $500,000 ÷ (1 + 4%)5**  **= $500,000 ÷ 1.045**  **= $410,963.55**  **(b) Using tables:** | | |
| **Present value of the single payment:** | | |  |
| **$500,000 X .82193** | | | **$410,965.00** |
|  | | |  | |
| **(c) Using a financial calculator:** |

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ (410,963.55)** |
| **I** | **4%** |
| **N** | **5** |
| **PMT** | **$ 0** |
| **FV** | **$500,000** |
| **Type** | **0** |

**Brief Exercise 3.13 (Continued)**

|  |
| --- |
| **(d) Using Excel: =PV(rate,nper,pmt,fv,type)** |



**Result: ($410,963.55)**

LO 3 BT: AP Difficulty: M Time: 20 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.14**

**(a) Using tables:**

**Present value = Future amount × Present value of 1 Factor  
$3,152 = $10,000 × Present value of 1 Factor  
Present value of 1 Factor = $3,152 ÷ $10,000   
Present value of 1 Factor = 0.31520**

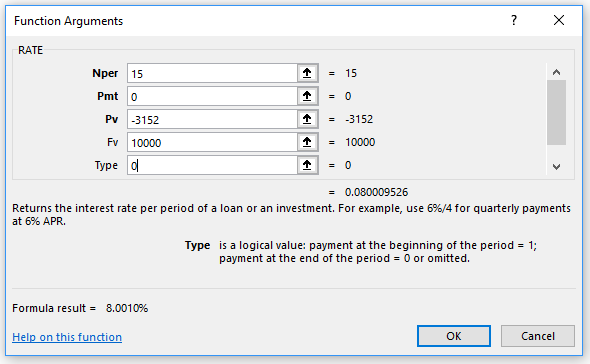
**The closest PV factor for 15 periods is 0.31524, which is found in the 8% column. As this factor is almost exactly equal to 0.31520, this means Kerry Dahl will earn an 8% return.**

**(b) Using a financial calculator**:

|  |  |
| --- | --- |
| **PV** | **$ (3,152)** |
| **I** | **? %** | **Yields 8.001 %** |
| **N** | **15** |
| **PMT** | **0** |
| **FV** | **$ 10,000** |
| **Type** | **0** |

**Brief Exercise 3.14 (CONTINUED)**

**(c) Using Excel: =RATE(nper,pmt,pv,fv,type)**



**Result: 8%**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

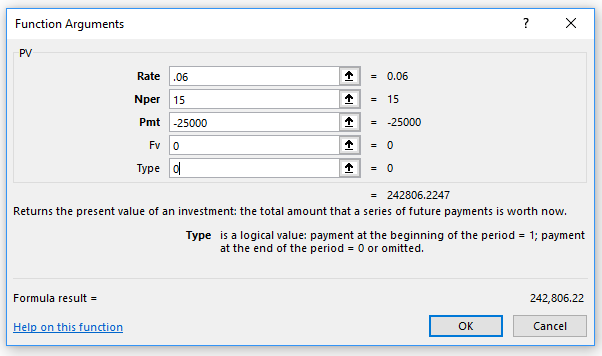
**Brief Exercise 3.15**

|  |  |
| --- | --- |
| **(a) Using tables:** | |
| **Present value of the annuity collections: payments:** | |  |
| **$25,000 X 9.71225** | | **$242,806.25** |

**(b) Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 242,806.22** |
| **I** | **6%** |
| **N** | **15** |
| **PMT** | **$ 25,000** |
| **FV** | **0** |
| **Type** | **0** |

**(c) Using Excel: =PV(rate,nper,pmt,fv,type)**



**Result: $242,806.22**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.16**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Annual Interest Rate** | **Number of Years** | **Frequency of Payment** | **(n) or NPER Number of Periods** | **(i) or Rate**  **Discount Rate** |
|
|
| **1.** | **8%** | **3** | **Quarterly** | **3 × 4 = 12** | **8% ÷ 4 = 2%** |
| **2.** | **5%** | **4** | **Semi-annually** | **4 × 2 = 8** | **5% ÷ 2 = 2.5%** |
| **3.** | **7%** | **5** | **Annually** | **5** | **7%** |
| **4.** | **4%** | **3** | **Quarterly** | **3 × 4 = 12** | **4% ÷ 4 = 1%** |
| **5.** | **6%** | **6** | **Semi-annually** | **6 × 2 = 12** | **6% ÷ 2 = 3%** |
| **6.** | **6%** | **15** | **Monthly** | **15 × 12 = 180** | **6% ÷ 12 = 0.5%** |

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.17**

|  |  |  |
| --- | --- | --- |
|  | **PV of 1 (Table PV.1)** | **PV of an Annuity of 1  (Table PV.2)** |
| **a. *n* = 4, *i* = 4****½%** | **.83875** | **3.587925** |
| **b. *n* = 6, *i* = 6½ %** | **.68565** | **4.84193** |

**Interpolation calculation:**

**a.**

***n* = 4, *i* = 4% factor .85480 3.62990**

***n* = 4, *i* = 5% factor .82270 3.54595**

**Sum of two factors 1.67750 7.17585**

**Average of two factors ÷ 2 ÷ 2**

***n* = 4, *i* = 4.5% factor .83875 3.587925**

**b.**

***n* = 6, *i* = 6% factor .70496 4.91732**

***n* = 6, *i* = 7% factor .66634 4.76654**

**Sum of two factors 1.37130 9.68386**

**Average of two factors ÷ 2 ÷ 2**

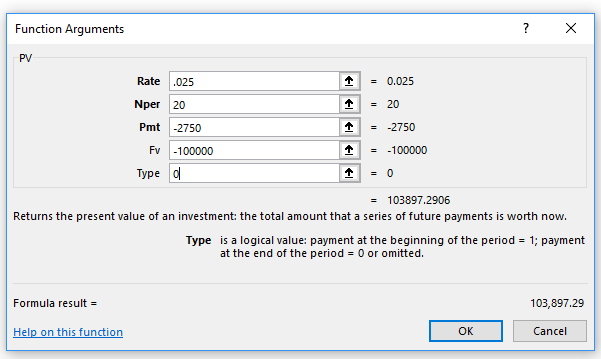
***n* = 6, *i* = 6.5% factor .68565 4.84193**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.18**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **(a) Using tables:** | | | | | |
| **Present value of the principal** | | | |  | |
| **$100,000 X .61027** | | | | **$61,027.00** | |
| **Present value of the interest payments** | | | |  | |
| **$2,750 X 15.58916** | | | | **42,870.19** | |
| **Issue price** | | | | **$103,897.19** | |
| **(b) Using a financial calculator:** | |
| **PV** | **?** | **Yields $ 103,897.29** | |
| **I** | **2.5%** |
| **N** | **20** |
| **PMT** | **$ (2,750)** |
| **FV** | **$ (100,000)** |
| **Type** | **0** |

**(c) Using Excel: =PV(rate,nper,pmt,fv,type)**

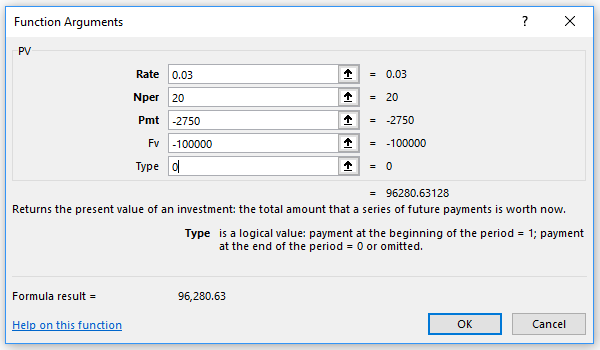


**Result: $103,897.29**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**BRIEF EXERCISE 3.19**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **(a) Using tables:** | | | | | | |
| **Present value of the principal** | | | | |  | |
| **$100,000 X .55368** | | | | | **$55,368.00** | |
| **Present value of the interest payments** | | | | |  | |
| **$2,750 X 14.87747** | | | | | **40,913.04** | |
| **Issue price** | | | | | **$96,281.04** | |
| **(b) Using a financial calculator:** | |
| **PV** | **?** | **Yields $ 96,280.63** | | |
| **I** | **3%** |
| **N** | **20** |
| **PMT** | **$ (2,750)** |
| **FV** | **$ (100,000)** |
| **Type** | **0** |
| **(c) Using Excel: =PV(rate,nper,pmt,fv,type)** | | | |



**Result: $96,280.63**

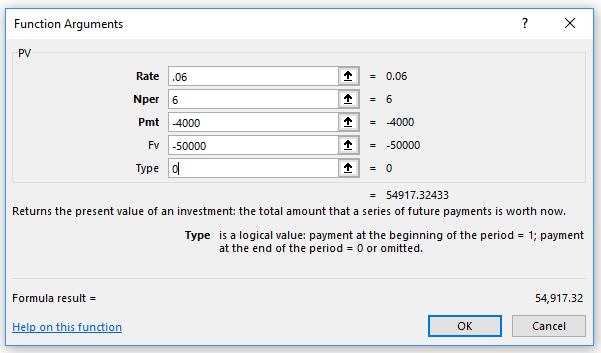
LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance **Brief Exercise 3.20**

|  |  |  |  |
| --- | --- | --- | --- |
| **(a) Using Tables:**  **Present value of the principal** | | |  |
| **$50,000 X .70496** | | | **$35,248.00** |
| **Present value of the interest payments** | | |  |
| **$4,000 X 4.91732** | | | **19,669.28** |
| **Issue price** | | | **$54,917.28** |
| **(b) Using a financial calculator:** |

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 54,917.32** |
| **I** | **6%** |
| **N** | **6** |
| **PMT** | **$ (4,000)** |
| **FV** | **$ (50,000)** |
| **Type** | **0** |

**Brief EXERCISE 3-20 (CONTINUED)**

|  |
| --- |
| **(c) Using Excel: =PV(rate,nper,pmt,fv,type)** |
|  |



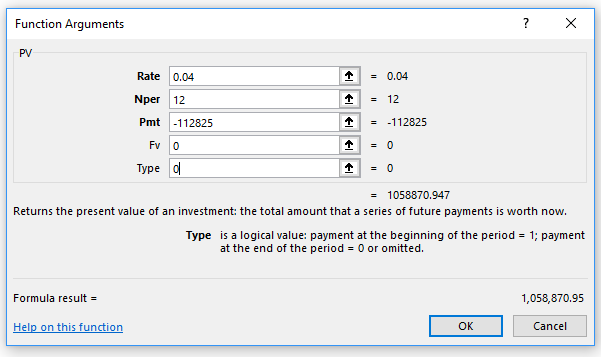
**Result: $59,917.32**

LO 3 BT: AP Difficulty: M Time: 20 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.21**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **(a) Using tables:**  **Present value of the instalment payments:** | | | |  | |
| **$112,825 X 9.38507** | | | | **$1,058,870.52** | |
|  | | | |  | | |
| **(b) Using a financial calculator:** | |
| **PV** | **?** | **Yields $ 1,058,870.95** | |
| **I** | **4%** |
| **N** | **12** |
| **PMT** | **$ (112,825)** |
| **FV** | **0** |
| **Type** | **0** |

|  |
| --- |
| **(c) Using Excel: =PV(rate,nper,pmt,fv,type)** |



**Result: $1,058,870.95**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.22**

**(a) Using a financial calculator:**

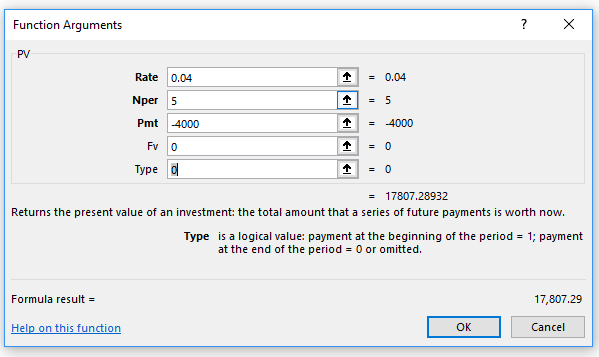
|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 17,807.29** |
| **I** | **4%** |
| **N** | **5** |
| **PMT** | **$ (4,000)** |
| **FV** | **0** |
| **Type** | **0** |

|  |
| --- |
| **(b) Using Excel: =PV(rate,nper,pmt,fv,type)** |

**Payments total ($4,000 x 5) $20,000.00**

**Present value of note (principal) 17,807.29**

**Amount of interest in payments $ 2,192.71**



**Result: $17,807.29**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.23**

**(a) Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 18,045.55** |
| **I** | **1%1** |
| **N** | **20** |
| **PMT** | **$ (1,000)** |
| **FV** | **0** |
| **Type** | **0** |

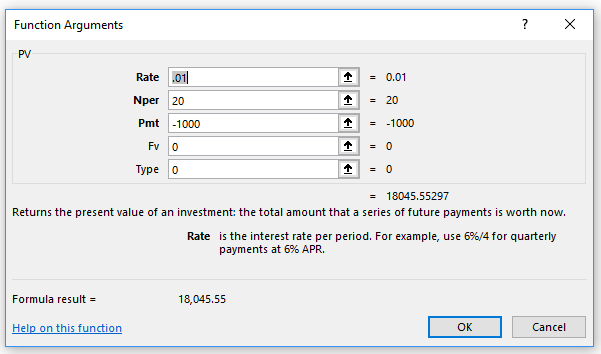
**1 (4% / 4)**

|  |
| --- |
| **(b) Using Excel: =PV(rate,nper,pmt,fv,type)** |

**Payments total ($4,000 x 5) $20,000.00**

**Present value of note (principal) 18,045.55**

**Amount of interest in payments $ 1,954.45**



**Result: $18,045.55**

**The amount of interest is lower because the cash is received more quickly.**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

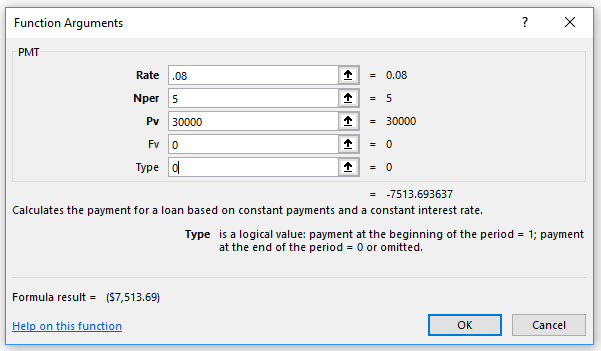
**Brief Exercise 3.24**

|  |  |
| --- | --- |
| **(a) Using tables:**  **Amount of annuity payments:** |  |
| **$30,000 ÷ 3.99271** | **$7,513.69** |

**(b) Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
|  | | |
| **PV** | **$ 30,000.00** |  | |
| **I** | **8%** |  |
| **N** | **5** |  |
| **PMT** | **$ ?** | **Yields $(7,513.69)** |
| **FV** | **$ 0** |  |
| **Type** | **0** |  |

|  |
| --- |
| **(c) Using Excel: =PMT(rate,nper,pv,fv,type)** |



**Result: ($7,513.69)**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

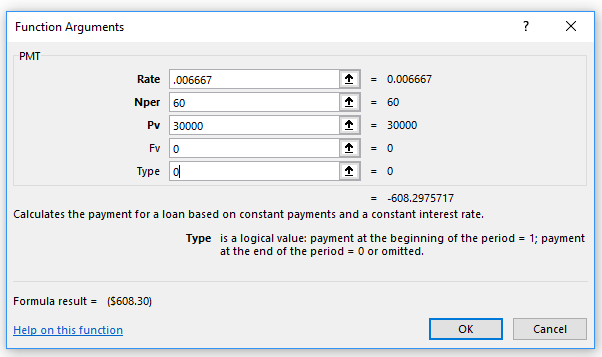
**Brief Exercise 3.25**

**(a) Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
|  | | |
| **PV** | **$ 30,000.00** |  | |
| **I** | **.6667%1** |  |
| **N** | **60** |  |
| **PMT** | **$ ?** | **Yields $(608.30)** |
| **FV** | **$ 0** |  |
| **Type** | **0** |  |

**1****(8% / 12)\_**

|  |
| --- |
| **(b) Using Excel: =PMT(rate,nper,pv,fv,type)** |



**Result: ($608.30)**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.26**

**(a) Using tables:**

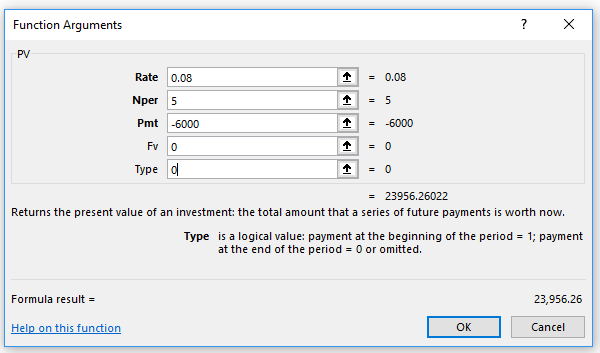
**The present value of an annuity stream of $6,000 per year, for 5 years at 8% is: $6,000 × 3.99271 = $23,956.26**

**If the price of the car you would like to purchase is $30,000, then you need to receive a $6,043.74 trade-in value for your existing vehicle.**

**(b) Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **$ ?** | **Yields $23,956.26** |
| **I/Y** | **8%** |  |
| **N** | **5** |  |
| **PMT** | **$(6,000)** |  |
| **FV** | **$0** |  |
| **Type** | **0** |  |

|  |
| --- |
| **(c) Using Excel: = PV(rate,nper,pmt,fv,type)** |



**Result: $23,956.26**

LO 3 BT: AP Difficulty: M Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.27**

**For the first option – annual payments:**

**(a) Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **$ ?** | **Yields $39,927.10** |
| **I/Y** | **8%** |  |
| **N** | **5** |  |
| **PMT** | **$(10,000)** |  |
| **FV** | **$0** |  |
| **Type** | **0** |  |

|  |
| --- |
| **(b) Using Excel: = PV(rate,nper,pmt,fv,type)** |

**Result: $39,927.10**

**Brief EXERCISE 3-27 (CONTINUED)**

**For the second option – delayed lump-sum payment:**

1. **Using a financial calculator:**

**You need to calculate the present value of the single payment of $46,000 two years after purchasing the equipment.**

|  |  |  |
| --- | --- | --- |
| **PV** | **$ ?** | **Yields $39,437.59** |
| **I/Y** | **8%** |  |
| **N** | **2** |  |
| **PMT** | **0** |  |
| **FV** | **$(46,000)** |  |
| **Type** | **0** |  |

|  |
| --- |
| **(b) Using Excel: = PV(rate,nper,pmt,fv,type)** |

**Result: $39,437.59**

**Therefore, option 2 is the less expensive financing option.**

LO 3 BT: AP Difficulty: M Time: 25 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief Exercise 3.28**

**For the first option – annual payments:**

**(a) Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **$ ?** | **Yields $37,907.87** |
| **I/Y** | **10%** |  |
| **N** | **5** |  |
| **PMT** | **$(10,000)** |  |
| **FV** | **$0** |  |
| **Type** | **0** |  |

|  |
| --- |
| **(b) Using Excel: = PV(rate,nper,pmt,fv,type)** |
|  |

**Result: $37,907.87**

**Brief EXERCISE 3-28 (CONTINUED)**

**For the second option – delayed lump-sum payment:**

**(a) Using a financial calculator:**

**You need to calculate the present value of the single payment of $46,000 two years after purchasing the equipment.**

|  |  |  |
| --- | --- | --- |
| **PV** | **$ ?** | **Yields $38,016.53** |
| **I/Y** | **10%** |  |
| **N** | **2** |  |
| **PMT** | **0** |  |
| **FV** | **$(46,000)** |  |
| **Type** | **0** |  |

|  |
| --- |
| **(b) Using Excel: = PV(rate,nper,pmt,fv,type)** |

**Result: $38,016.53**

**Therefore, option 1 is the less expensive financing option.**

LO 3 BT: AP Difficulty: M Time: 25 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**Brief EXERCISE 3-29**

1. **In arriving at the two different options, the vendor would have done the same calculations as those performed by the buyer, except that the result must compare favourably with the cash selling price to compensate the vendor for taking on added risk. Assuming the vendor needed an 8% yield on the loan, Option 1, which is $10,000 at the end of each year for 5 years had a present value of 39,927.10. Option 2, which is a lump-sum payment of $46,000 at the end of two years has the present value of $39,437.59. With higher interest rates the difference between these two options becomes much smaller, to the point where the choice for the most lucrative option changes.**
2. **The cash selling price, assuming an 8% yield rate on the loan would likely have been lower than $38,000.** **Delaying payments adds risk of non-collection. This risk would be addressed with an allowance for doubtful accounts management would deem necessary, considering the credit history of the buyer.**
3. **Delaying payments adds risk of non-collection. This risk would be addressed with an allowance for doubtful accounts management would deem necessary, considering the credit history of the buyer**
4. **For financial reporting purposes, the loan would be accounted for the same way, imputing interest over the term of the loan. There would be some classification differences (current versus non-current) for the SFP due to the difference in the terms of the loans.**

**Had the vendor followed ASPE, there would be no change to the answers above.**

LO 3,4 BT: C Difficulty: C Time: 20 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**SOLUTIONS TO EXERCISES**

**EXERCISE 3.1**

1. **Hoda must consider the following three items:**

* **The amount of cash flows that are expected from the investment. Dividends have been received in the past, but management would have to consider if those dividends are expected to continue and in what amount.**
* **The timing of the cash flows. Since cash flows will need to be discounted to a present value, it is relevant to consider when the cash is expected to be received.**
* **The risk involved in the cash flows. Hoda will need to consider the discount rate to be used in calculating the present value and whether that discount rate needs to be a risk-adjusted rate, or if the cash flows will be adjusted for risk of uncertainty**

**Hoda will also need to consider for how long the shares are intended to be held, and the purpose for this investment. Is the purpose just to collect dividends, or does Hoda intend to derive some other economic benefit from this company? Does Hoda have the ability to exert some influence with their 25% ownership?**

1. **Under the traditional approach, cash flows are discounted using the risk-adjusted rate:**

**Annual cash expected = $80,000 x PV factor of annuity, 5 years, 6%**

**= $80,000 x 4.21236 = $336,989**

**Plus, the sale proceeds expected at the end of year 5:**

**$1,000,000 x PV factor of lump sum, 5 years, 6%**

**= $1,000,000 x .74726 = 747,260**

**The fair value is the sum of the two amounts:**

**= $336,989 + $747,260 = $1,084,249**

**EXERCISE 3.1 (CONTINUED)**

1. **Under the expected cash flow approach, cash flows are adjusted for risk and are discounted at the risk-free rate, since the cash flows already incorporate risk expected.**

**In this case, there is an 80% chance dividends of $80,000 will be received and a 20% chance they will be $50,000.**

**The probability-weighted annual cash flow is:**

**80,000 x 80% = $64,000**

**50,000 x 20% = 10,000**

**$74,000**

**Discounting the cash flows:**

**Annual cash flow = $74,000 x PV factor of annuity, 5 years, 4%**

**= $74,000 x 4.45182 = $329,435**

**Plus, the sale proceeds expected at the end of year 5:**

**$1,000,000 x PV factor of lump sum, 5 years, 4%**

**= $1,000,000 x .82193 = $821,930**

**The fair value is the sum of the two amounts:**

**= $329,435 + $821,930 = $1,151,365**

1. **The expected cash flow approach is best since the cash flows are uncertain.**

LO 1 BT: AP Difficulty: M Time: 30 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

EXERCISE 3.2

**a. This exercise determines the present value of an ordinary annuity or expected cash flows as a fair value estimate.**

**Cash flow Probability Expected**

**Estimate X Assessment = Cash Flow**

**$ 380,000 20% $ 76,000**

**630,000 50% 315,000**

**750,000 30% 225,000**

**$616,000**

**Expected Cash Flow X PV Factor, n = 8, I = 8% Present Value**

1. **Using PV.2 table:**

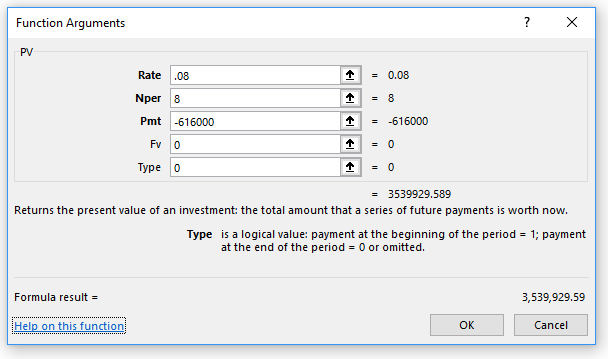
**$616,000 X 5.74664 = $3,539,930**

1. **Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **$ ?** | **Yields $3,539,929.59** |
| **I/Y** | **8%** |  |
| **N** | **8** |  |
| **PMT** | **$(616,000)** |  |
| **FV** | **$0** |  |
| **Type** | **0** |  |

**EXERCISE 3.2 (CONTINUED)**

|  |
| --- |
| 1. **Using Excel: = PV(rate,nper,pmt,fv,type)** |



**Result: $3,539,929.59**

**The fair value estimate of the trade name exceeds the carrying value; thus, no impairment is recorded.**

**b. This fair value is based on unobservable inputs—Killroy’s own data on the expected future cash flows associated with the trade name. This fair value estimate is considered Level 3.**

**EXERCISE 3.2 (CONTINUED)**

1. **Measurement Uncertainty - Note XX**

**The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities, at the date of the financial statements, and the reported amounts of the revenues and expenses during the period.**

**The trade name purchased in an acquisition of McClellan Company has been assessed for impairment on an annual basis. The impairment test has used cash flow estimates over the next eight years. These estimates were based on internal information and use the assumption that the trade name will have no salvage value after the eight years.**

**Estimates are based on the best information available at the time of preparation of the financial statements and are reviewed annually to reflect new information as it becomes available. Measurement uncertainty exists in these financial statements. Actual results could differ from these estimates.**

LO 2 BT: AP Difficulty: C Time: 25 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

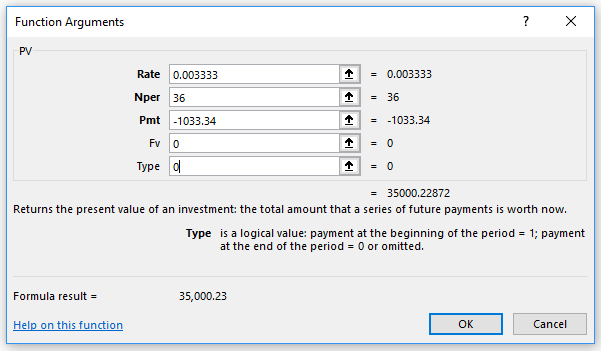
EXERCISE 3.3

1. **To calculate the present value of the future cash payments under the note:**
2. **Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 35,000.23** |
| **I** | **.3333%1** |
| **N** | **36** |
| **PMT** | **$ (1,033.34)** |
| **FV** | **$ 0** |
| **Type** | **0** |

**1 (4% / 12 months)**

1. **Using Excel: =PV(rate,nper,pmt,fv,type)**



**Result: $35,000.23**

**Purchase price of the used truck:**

**PV of future cash flows $35,000.23**

**Down payment 4,000.00**

**Total purchase price $39,000.23**

**EXERCISE 3.3 (CONTINUED)**

1. **The forgiveness of the first two monthly payments affects the transaction price of the used truck. Time value of money must be imputed in the delayed start of payments to arrive at the present value of the future cash flows under the terms of the note. Interest accrues from the date of purchase and must be recognized each month as an expense although the cash flows of the monthly payments are delayed two months.**
2. **To calculate the present value of the future cash payments under the note involves two steps:**

**Step 1: calculate the present value of the annuity of 34 payments of $1,033.34.**

1. **Using a financial calculator:**

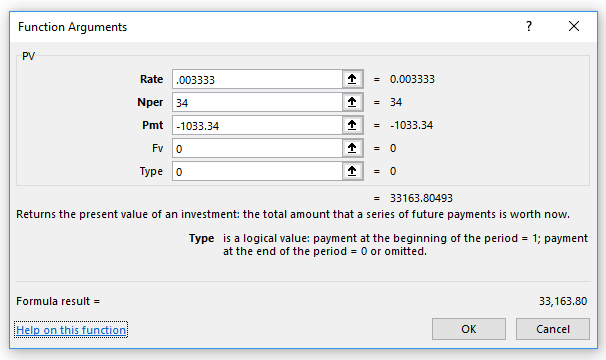
|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 33,163.80** |
| **I** | **.3333%1** |
| **N** | **34** |
| **PMT** | **$ (1,033.34)** |
| **FV** | **$ 0** |
| **Type** | **0** |

**1 (4% / 12 months)**

**EXERCISE 3.3 (CONTINUED)**

**c. 1. (Continued)**

|  |
| --- |
| 1. **Using Excel: =PV(rate,nper,pmt,fv,type)** |



**Result: $33,163.80**

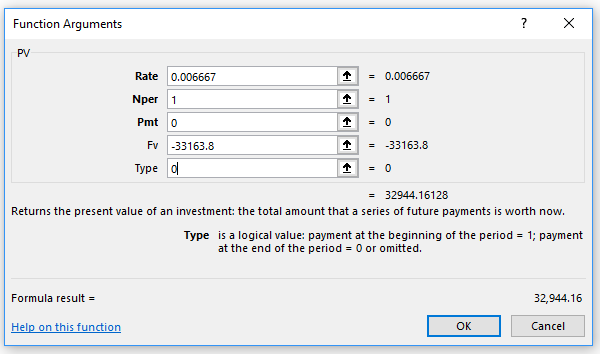
1. **The second step is to bring the present value of $33,163.80 to the date of purchase using an annual rate of 4%.**
2. **Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 32,944.17** |
| **I** | **.6667%1** |
| **N** | **1** |
| **PMT** | **$ 0** |
| **FV** | **$ (33,163.80)** |
| **Type** | **0** |

**1 (4% x 2/12 months)EXERCISE 3.3 (CONTINUED)**

**c. 2. (Continued)**

1. **Using Excel: =PV(rate,nper,pmt,fv,type)**



**Result: $32,944.16**

1. **Purchase price of the used truck:**

**PV of future cash flows $32,944.16**

**Down payment 4,000.00**

**Total purchase price $36,944.16**

1. **The amount of interest accrued at the end of the first month following the purchase will be:**

**$32,944.16 x .04 x 1/12 = $109.81**

LO 3 BT: AP Difficulty: C Time: 40 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

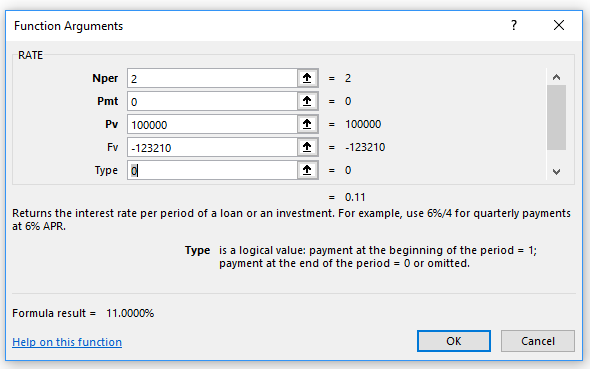
**EXERCISE 3.4**

**a.**

1. **Using a financial calculator**:

|  |  |
| --- | --- |
| **PV** | **$ 100,000** |
| **I** | **? %** | **Yields 11.0 %** |
| **N** | **2** |
| **PMT** | **0** |
| **FV** | **$ (123,210)** |
| **Type** | **0** |

1. **Excel formula =RATE(nper,pmt,pv,fv,type)**



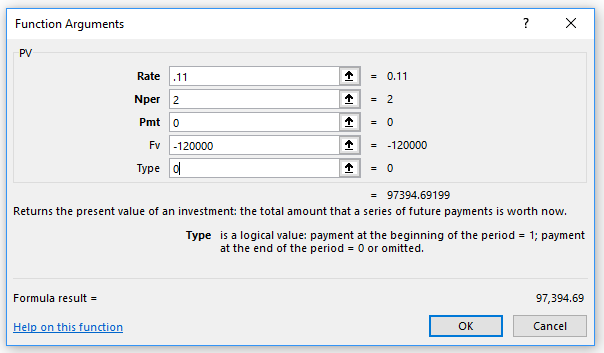
**Result: 11%**

**EXERCISE 3.4 (CONTINUED)**

1. **1.Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 97,394.69** |
| **I** | **11%** |
| **N** | **2** |
| **PMT** | **0** |
| **FV** | **$(120,000.00)** |
| **Type** | **0** |

**2. Using Excel: = PV(rate,nper,pmt,fv,type)**



**Result: $97,394.69**

LO 3 BT: AP Difficulty: M Time: 20 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**EXERCISE 3.5**

1. **Total interest = Total payments – Amount owed today**

**$162,745 (10 X $16,274.53) – $100,000 = $62,745.**

1. **Sosa should borrow from the bank, since the 9% rate is lower than the manufacturer’s 10% rate determined below.**
2. **Using table PV.2**

**PV–OA10, i% = $100,000 ÷ $16,274.53**

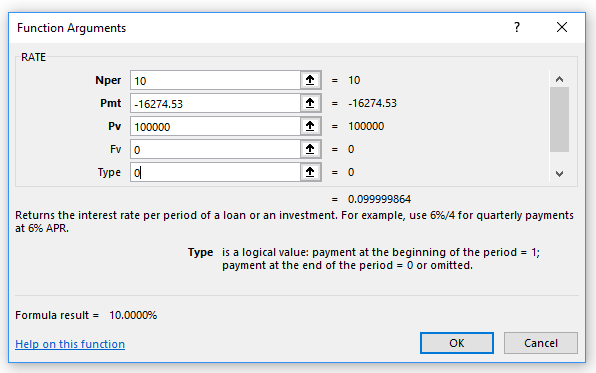
**= 6.14457— Inspection of the 10-period row reveals a rate of 10%.**

1. **Using a financial calculator:**

|  |  |
| --- | --- |
| **PV** | **$ 100,000** |
| **I** | **? %** | **Yields 10.0 %** |
| **N** | **10** |
| **PMT** | **$(16,274.53)** |
| **FV** | **0** |
| **Type** | **0** |

**EXERCISE 3.5 (CONTINUED)**

1. **(Continued)**
2. **Excel formula =RATE(nper,pmt,pv,fv,type)**



**Result: 10%**

LO 3 BT: AP Difficulty: M Time: 20 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**EXERCISE 3.6**

**Building A—PV = $600,000.**

**Building B**

**(a) Using factor table A.4**

**Rent X (PV of annuity due of 25 periods at 12%) = PV**

**$69,000 X 8.78432 = PV**

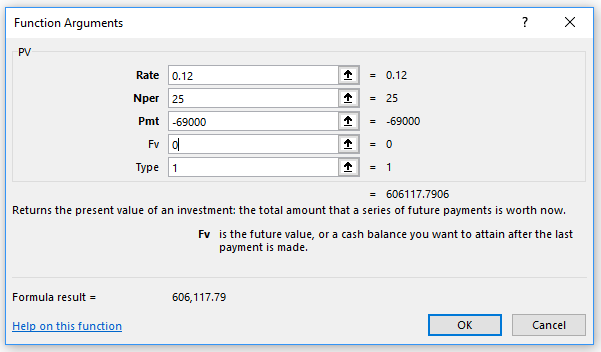
**$606,118 = PV**

**(b)Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 606,117.79** |
| **I** | **12%** |
| **N** | **25** |
| **PMT** | **$ (69,000)** |
| **FV** | **0** |
| **Type** | **1** |

**EXERCISE 3.6 (CONTINUED)**

|  |
| --- |
| **(c) Using Excel: =PV(rate,nper,pmt,fv,type)** |



**Result: $606,117.79**

**Building C**

1. **Using factor table A.4**

**Rent X (PV of ordinary annuity of 25 periods at 12%) = PV**

**$7,000 X 7.84314 = PV**

**$54,902 = PV**

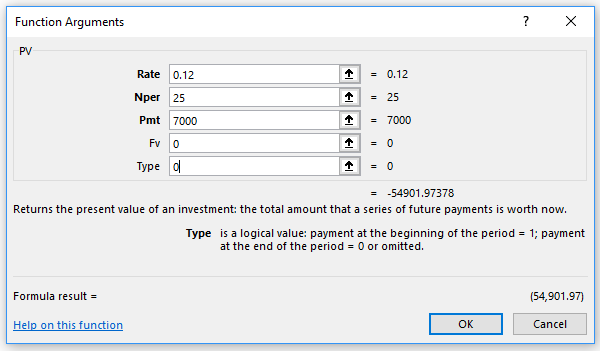
|  |  |  |
| --- | --- | --- |
|  | **Cash purchase price** | **$650,000** |
|  | **PV of rental income** | **– 54,902** |
|  | **Net present value** | **$595,098** |

**EXERCISE 3.6 (CONTINUED)**

1. **Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ (54,901.97)** |
| **I** | **12%** |
| **N** | **25** |
| **PMT** | **$ 7,000** |
| **FV** | **0** |
| **Type** | **0** |

|  |
| --- |
| 1. **Using Excel: =PV(rate,nper,pmt,fv,type)** |
|  |



**Result: ($54,901.97)**

**Answer: Lease Building C since the present value of its net cost is the smallest. Where the difference between alternatives is relatively small, it is also important to consider qualitative factors.**

LO 3 BT: AP Difficulty: M Time: 25 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**EXERCISE 3.7**

**a. Time diagram:**

# Viavélo Inc.

**PV =? i = 5%**

**PV–OA =? Principal**

**$2,000,000 interest**

**$110,000 $110,000 $110,000 $110,000 $110,000 $100,000**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

**0 1 2 3 26 27 28**

**n = 28**

1. **Using factor tables A.2 and A.4**

**Formula for the interest payments:**

**PV–OA = R (PVF–OAn, i)**

**PV–OA = $110,000 (PVF–OA28, 5%)**

**PV–OA = $110,000 (14.89813)**

**PV–OA = $1,638,794**

**Formula for the principal:**

**PV = FV (PVFn, i)**

**PV = $2,000,000 (PVF28, 5%)**

**PV = $2,000,000 (0.25509)**

**PV = $510,180**

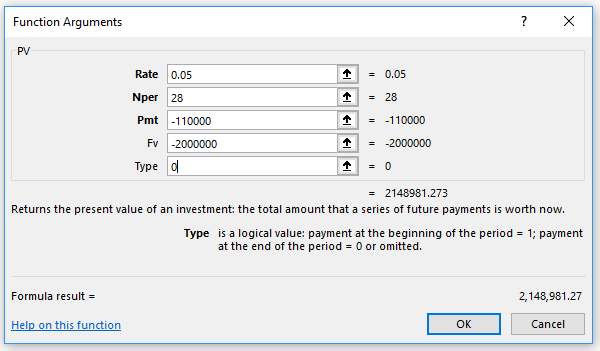
**The selling price of the bonds = $1,638,794 + $510,180 = $2,148,974**

**EXERCISE 3.7 (CONTINUED)**

1. **Using a financial calculator:**

|  |  |  |
| --- | --- | --- |
| **PV** | **?** | **Yields $ 2,148,981.27** |
| **I** | **5%** |
| **N** | **28** |
| **PMT** | **$ (110,000)** |
| **FV** | **$(2,000,000)** |
| **Type** | **0** |

|  |
| --- |
| 1. **Using Excel: =PV(rate,nper,pmt,fv,type)** |



**Result: $2,148,981.27**

1. **The bonds are reported at amortized cost, a cost-based measure.**

1. **There are no measurement uncertainties for this bond liability that would require disclosure in Viavélo’s financial statement notes. The amounts and timing of cash flows are fixed along with the rate of interest as stated in the bond agreement.**

LO 3 BT: AP Difficulty: M Time: 20 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**EXERCISE 3.8**

**a.**

**Time diagram:**

**i = 11%**

**R R R**

**PV–OA = $365,755 ? ? ?**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |

**0 1  24 25**

**n = 25**

1. **Using factor table A.4**

**Formula: PV–OA = R (PV–OAn, i)**

**$365,755 = R (PVF–OA25, 11%)**

**$365,755 = R (8.42174)**

**R = $365,755 ÷ 8.42174**

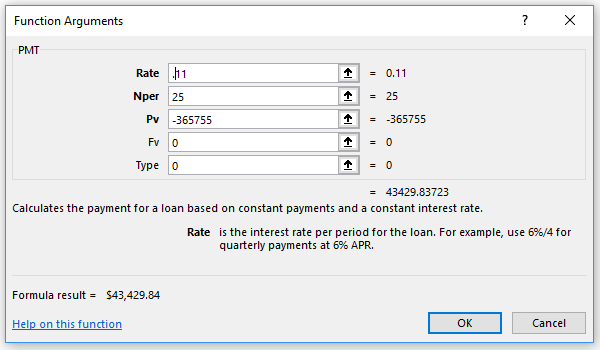
**R = $43,430**

1. **Using a financial calculator:**

|  |  |
| --- | --- |
| **PV** | **$ (365,755)** |
| **I** | **11%** |
| **N** | **25** |
| **PMT** | **$ ?** | **Yields $43,429.84** |
| **FV** | **$ 0** |
| **Type** | **0** |

**EXERCISE 3.8 (CONTINUED)**

1. **Excel formula =PMT(rate,nper,pv,fv,type)**



**Result: $43,429.84**

1. **Danyleyko is using the income model to convert future cash flows from the leasing of the machine.**
2. **Before entering into the transaction, Danyleyko would have determined the collection risk that was involved with this particular lessee. They would have considered the type of asset being leased and the ability of using this asset for satisfaction of the debt should the lessee default. Danyleyko is not relying on any cash flows at the maturity of the lease derived from the resale of the asset, as no residual or salvage value is expected at the end of the 25-year lease.**

**The amount and timing of the cash flows are fixed along with the rate of interest as outlined in the lease agreement. At the inception of the lease, Danyleyko would likely assume that the lease payments are all collectible and thus no additional disclosures are required relating to measurement uncertainty.**

LO 3 BT: AP Difficulty: C Time: 20 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**EXERCISE 3.9**

**Expected**

**Cash Flow Probability Cash**

**Estimate X Assessment = Flow**

**a. $ 4,800 20% $ 960**

**6,300 50% 3,150**

**7,500 30% 2,250**

**Total Expected Value $ 6,360**

**b. $ 5,400 30% $ 1,620**

**7,200 50% 3,600**

**8,400 20% 1,680**

**Total Expected Value $ 6,900**

**c. $ (1,000) 10% $ (100)**

**3,000 80% 2,400**

**5,000 10% 500**

**Total Expected Value $ 2,800**

LO 1,3 BT: AP Difficulty: S Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**EXERCISE 3.10**

**Estimated**

**Cash Probability Expected**

**Outflow X Assessment = Cash Flow**

**$200 10% $ 20**

**450 30% 135**

**600 50% 300**

**750 10% 75 $ 530**

**Present Value = Expected Cash Flow X PV Factor Table PV.1, n = 2, I = 6%**

**Present Value = $530 X .89000 = $472**

LO 1,3 BT: AP Difficulty: S Time: 15 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**SOLUTIONS TO PROBLEMS**

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.1** |  |

1. The forgiveness of the first three monthly payments affects the transaction price of the asset acquired using the lease. The time value of money must be considered in the delayed start of payments. Interest accrues from June 1, 2020 on the lease obligation and must be recognized each month as an expense although the cash flows of the monthly payments are delayed three months and start on September 30, 2020.
2. To calculate the present value of the future cash payments under the lease involves two steps:

Step 1: calculate the present value of the annuity of payments that begin September 30, 2020 and end May 31, 2022 (21 payments in all – 2 years x 12 months less 3 months forgiveness) on September 1,2020

1. Using a financial calculator:

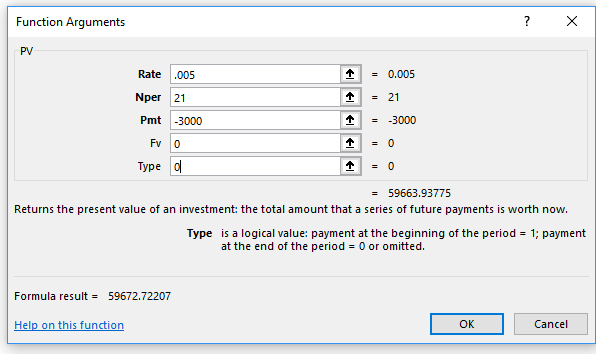
|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 59,663.94 |
| I | .5%1 |
| N | 21 |
| PMT | $ (3,000.00) |
| FV | $ 0 |
| Type | 0 |

1 (6% / 12 months)

**PROBLEM 3.1 (CONTINUED)**

1. (Continued)

|  |
| --- |
| 1. Using Excel: =PV(rate,nper,pmt,fv,type) |



Result: $59,663.94

The second step is to bring the present value of the of $59,663.94 on September 1, 2020 to June 1, 2020 using an annual rate of 6%.

1. Using a financial calculator:

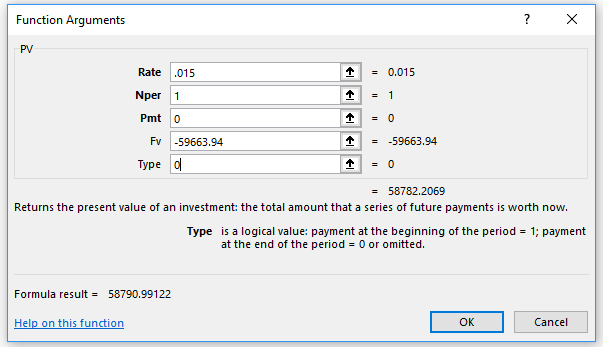
|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 58,782.21 |
| I | 1.5%1 |
| N | 1 |
| PMT | $ 0 |
| FV | $ (59,663.94) |
| Type | 0 |

1 (6% x 3/12 months)

**PROBLEM 3.1 (CONTINUED)**

1. (Continued)

|  |
| --- |
| 1. Using Excel: =PV(rate,nper,pmt,fv,type) |



Result: $58,782.21

The amount that Langevin will record as the lease obligation on June 1, 2020 is $58,782.21

1. The amount interest accrued at June 30, 2020 will be:

$58,782.21 x .06 x 1/12 = $293.91

1. The are no measurement uncertainties under the lease agreement. The amounts and timing of cash flows are clearly fixed and the rate of interest is stated in the lease. Normal note disclosure for long-term obligations would nevertheless include the amount of the total future lease payments owing for each of the next five years along with the portion that represents interest.

LO 1,3 BT: AP Difficulty: C Time: 45 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.2** |  |

1. There are no measurement uncertainties under either option offered to finance the purchase of equipment. The amounts and timing of cash flows are fixed and the rate of interest is stated in both options at 8%. The traditional approach for discounted cash flows should be used as the amounts and timing of the cash flows are fixed according to the agreements.
2. Quarterly fixed principal + interest payments option with manufacturer:

There will be 8 quarterly payments of fixed principal + interest and the amount of fixed principal would be ($80,000 / 8) = $10,000.00

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  | Beginning | Quarterly | 8%/4 |  |
|  |  | Loan | Principal | Interest | Total |
| Instal. | Date | Balance | Payment | Payment | Payment |
| Oct.1 | 2020 | $80,000 | $10,000 | $1,600 | $11,600 |
| Jan.1 | 2021 | 70,000 | 10,000 | 1,400 | 11,400 |
| Apr.1 | 2021 | 60,000 | 10,000 | 1,200 | 11,200 |
| July 1 | 2021 | 50,000 | 10,000 | 1,000 | 11,000 |
| Oct.1 | 2021 | 40,000 | 10,000 | 800 | 10,800 |
| Jan.1 | 2022 | 30,000 | 10,000 | 600 | 10,600 |
| Apr.1 | 2022 | 20,000 | 10,000 | 400 | 10,400 |
| July 1 | 2022 | 10,000 | 10,000 | 200 | 10,200 |
| Total |  |  |  |  | $87,200 |

**PROBLEM 3.2 (CONTINUED)**

1. (Continued)

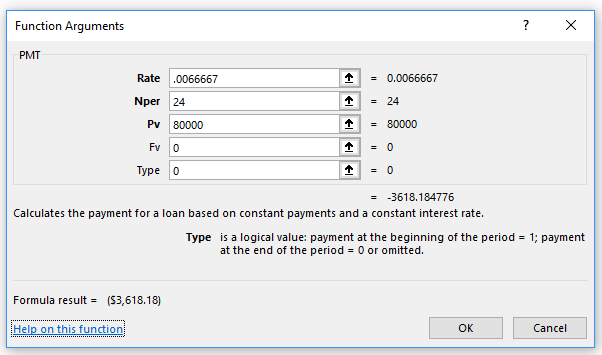
Fixed blended monthly instalment note with the bank including principal and interest:

1. Using a financial calculator:

|  |  |
| --- | --- |
| PV | $ 80,000 |
| I | 0.66667%1 |
| N | 24 |
| PMT | $ ? | Yields $3,618.18 |
| FV | $ 0 |
| Type | 0 |

1(8% /12 months)

1. Excel formula =PMT(rate,nper,pv,fv,type)



Result: $3,618.18

Total payments 24 x $3,618.18 = $86,836.32

**PROBLEM 3.2 (CONTINUED)**

1. Other considerations that M&B should look at in the selection between the two alternatives include:
2. The amount of debt already in place and the timing of the cash flows required by those obligations.
3. Loan conditions that would require strict loan covenants.
4. Planned future purchases that will require financing.
5. Liquidity considerations due to the difference in frequency of payments.
6. Financial ratios that could be affected by M&B’s choice include liquidity ratios, such as the current ratio that is affected by the amount of the current portion of the debt. In addition, the interest costs will affect the times interest earned ratio.

LO 1,3 BT: AP Difficulty: C Time: 35 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.3** |  |

1. At a minimum, an entity must determine

* the particular asset being measured (its condition, specific nature, location, etc.)
* whether the assets will be valued by the market as a group or on a stand-alone basis – the highest and best use that is legally, physically, and financially possible will be used
* availability of data, valuation technique to use, use of observable inputs

1. There are three levels in the fair value hierarchy

|  |  |
| --- | --- |
| Level 1 | level 1 inputs provide the most reliable fair values because these inputs are based on quoted prices in an active market for identical items |
| Level 2 | level 2 is the next most reliable and considers evaluating similar assets or liabilities in active markets or using observable inputs such as interest rates or exchange rates. |
| Level 3 | level 3 is the least reliable level since much judgement is needed based on the best information available. This often includes unobservable inputs and management judgements about how the markets would value the asset. |

**PROBLEM 3.3 (CONTINUED)**

c.

|  |  |
| --- | --- |
| Land – stand-alone | Level 1– Markets for land and real estate in general may not be very liquid nor necessarily transparent. Also, there would be little if any evidence regarding sales of an identical piece of land. Therefore, it is likely that no level 1 inputs are available.  Level 2 – quoted market prices for similar properties in the area could be obtained. It would depend on whether or not the real estate market was experiencing sufficient volume. Sufficient volume to form a “normal market” would result in better information.  Level 3 – management assumptions about how the market would value the land. In all likelihood, the company would have to rely on level 3 inputs to value the land, given the uniqueness of real estate in general. |

**PROBLEM 3.3 (CONTINUED)**

1. (Continued)

|  |  |
| --- | --- |
| Building – stand-alone | Level 1– quoted market prices do not likely exist for the building. The market may publish statistics such as price per square footage, however these would likely be an aggregation of all buildings in the area and as such would not necessarily reflect market prices for this particular building. It is unlikely that level 1 inputs would exist for the building.  Level 2 – see above comments. The prices per square foot may qualify as level 2 inputs (e.g., similar assets), as long as the market was active and there were sufficient transactions.  Level 3 – management assumptions about cash flows that could be generated from the use of the building at discount rates. |
| Equipment – stand-alone | Level 1 – perhaps a market price exists for used equipment although if the equipment were older, it may be difficult to obtain the price for identical equipment.  Level 2 – perhaps a market price exists for similar used equipment. Markets for used equipment often exist.  Level 3 – management assumptions about cash flows that could be generated from the use of the equipment at discount rates. |
| Overall manufacturing plant | Level 1 – unlikely to be an active market for the exact facility given its uniqueness.  Level 2 – perhaps a market multiple or price/earnings ratio exists for similar lines of business.  Level 3 – management assumptions about cash flows that could be generated from the use of the facility as a whole, at discount rates. |

**PROBLEM 3.3 (CONTINUED)**

1. Measurement Uncertainty - Note XX

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, and disclosure of contingent assets and liabilities, at the date of the financial statements, and the reported amounts of the revenues and expenses during the period. Items requiring the use of significant estimates include the useful life of plant assets, residual values of plant assets, rates for depreciation used, and possible impairment of plant assets.

Estimates are based on the best information available at the time of preparation of the financial statements and are reviewed annually to reflect new information as it becomes available. Measurement uncertainty exists in these financial statements. Actual results could differ from these estimates.

LO 2 BT: C Difficulty: M Time: 50 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.4** |  |

1. Time diagram for the first ten payments:

* Using PV.1 and PV.2 factor tables

i = 10%; n = 9; R = $800,000; PV of OD =??

$800,000 $800,000 $800,000 $800,000 $800,000 $800,000 $800,000

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

0  1 2 3 7 8 9 10

Step 1

Formula for the second to tenth payments:

PV of OA = R (PVF – OA n, i)

PV of OA = $800,000 (PVF – OA9, 10%)

PV of OA = $800,000 (5.75902)

PV of OA = $4,607,216

PV $4,607,216 + $800,000 = $5,407,216

Time diagram for the last ten payments:

i = 10%; n = 10; R = $400,000: PV =?

$400,000 $400,000 $400,000

|  |  |  |  |  |  |  |  |  |  |  |  |  |
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0  1 2  9 10 17 18 19

FVF (PVFn, i) R (PVF – OAn, i)

Formulas for the last ten payments:

Step 2 Present value of the last ten payments at January 1, 2029:

PV of OA = R (PVF – OAn, i)

PV of OA = $400,000 (PVF – OA10, 10%)

PV of OA = $400,000 (6.14457)

PV of OA = $2,457,828

**PROBLEM 3.4 (CONTINUED)**

a. 1. (continued)

Step 3: Present value of the last ten payments at January 1, 2020 using PV.1 tables for 9 periods:

PV = FV (PVFn, i)

PV = $2,457,828 (PVF9, 10%)

PV = $2,457,828 (.42410)

PV = $1,042,365

Step 4

The total cost for leasing the facilities is:

$5,407,216 + $1,042,365 = $6,449,581

1. Using a financial calculator – Payment for the second to tenth year:

Step 1

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 4,607,219.05 |
| I | 10% |
| N | 9 |
| PMT | $ (800,000) |
| FV | 0 |
| Type | 0 |

Payment Jan. 1, 2020 $ 800,000.00

Payments Jan. 1, 2021 to Jan. 1, 2030 PV 4,607,219.05

PV Jan. 1, 2020 of first ten-year period: $5,407,219.05

**PROBLEM 3.4 (CONTINUED)**

1. 2 (continued)

Using a financial calculator – Payments for the last ten years PV at January 1,2029:

Step 2

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 2,457,826.84 |
| I | 10% |
| N | 10 |
| PMT | $ (400,000) |
| FV | 0 |
| Type | 0 |

Using a financial calculator – PV of amount at January 1, 2029 at January 1,2020:

Step 3

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 1,042,358.51 |
| I | 10% |
| N | 9 |
| PMT | 0 |
| FV | $(2,457,826.84) |
| Type | 0 |

Step 4

The total cost for leasing the facilities is:

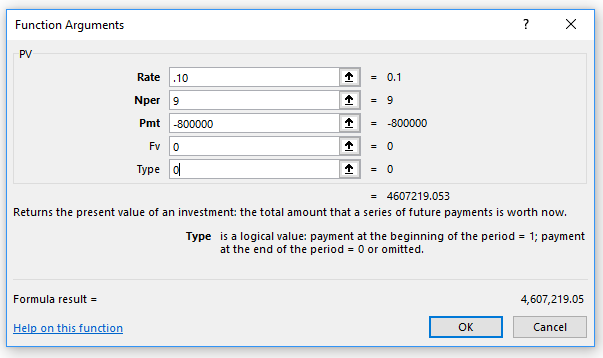
$5,407,219.05 + $1,042,358.51 = $6,449,577.56

**PROBLEM 3.4 (CONTINUED)**

1. (Continued)
2. Using Excel

Step 1 Payments for the second to tenth year:

$4,607,219.05



Result: $4,607,219.05

Payment Jan. 1, 2020 $ 800,000.00

Payments Jan. 1, 2021 to Jan. 1, 2030 PV 4,607,219.05

PV Jan. 1, 2020 of first ten-year period: $5,407,219.05

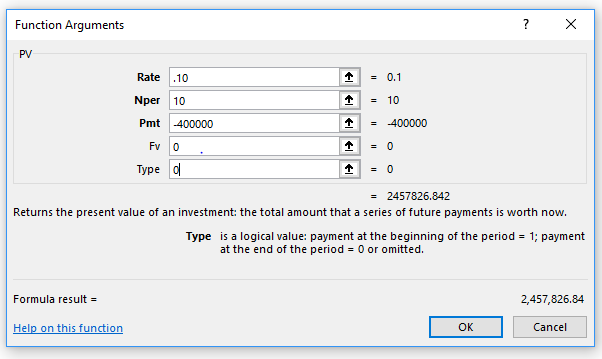
An alternative is to use Type 1, annuity due for 10 periods to arrive at the same amount.

**PROBLEM 3.4 (CONTINUED)**

1. 3. (Continued)

Step 2 Payments for the last ten years PV at January 1,2029

$2,457,826.84:



Result: $2,457,826.84

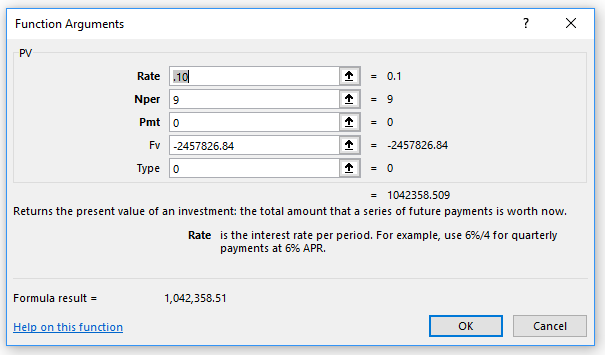
**PROBLEM 3.4 (CONTINUED)**

1. 3. (Continued)

PV of amount at January 1, 2029 at January 1,2020:

Step 3

Result $1,042,358,.51



Result: $1,042,358.51

Step 4

The total cost for leasing the facilities is:

$5,407,219.05 + $1,042,358.51 = $6,449,577.56.

b Since the present value of the cost for leasing the facilities, $6,449,577.56, is less than the cost for purchasing the facilities, $7,200,000, McDowell Enterprises should lease the facilities.

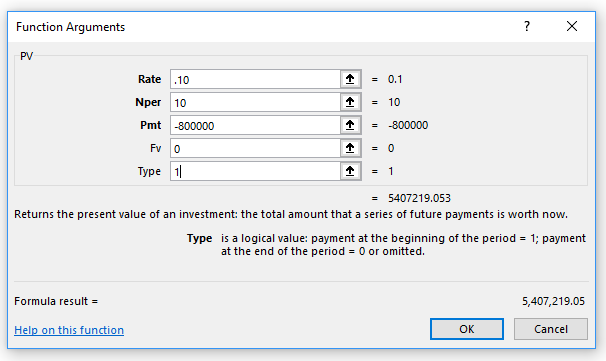
LO 1,3 BT: AP Difficulty: C Time: 50 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.5** |  |

Using Excel

Step 1 Payments for the first ten-year period:

$5,407,219.05

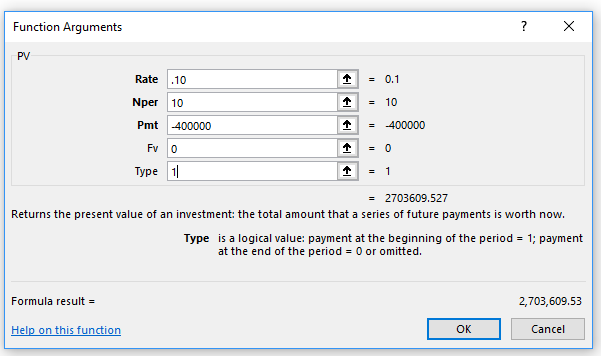


Result: $5,407,219.05

**PROBLEM 3.5 (CONTINUED)**

Step 2 Payments for the last ten years PV at January 1,2030

$2,703,609.53



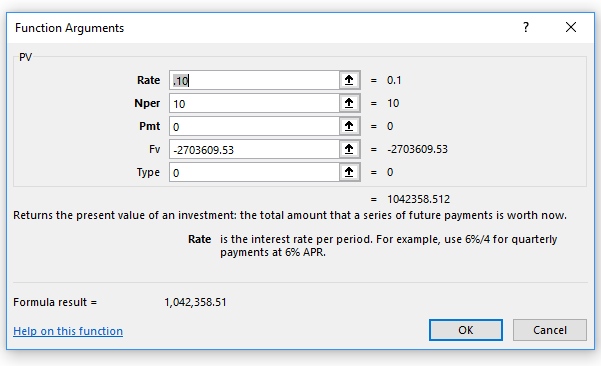
Result: $2,703,609.53

**PROBLEM 3.5 (CONTINUED)**

PV of amount at January 1, 2030 at January 1,2020:

Step 3

Result $1,042,358,.51



Result: $1,042.358.51

Step 4

The total cost for leasing the facilities is:

$5,407,219.05 + $1,042,358.51 = $6,449,577.56

The results and conclusions are the same as in P3.4. The present value of the cost for leasing the facilities, $6,449,577.56, is less than the cost for purchasing the facilities, $7,200,000, McDowell Enterprises should lease the facilities.

LO 1,3 BT: AP Difficulty: M Time: 45 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.6** |  |

a.

Time diagram:

i = 11%; n = 9; R = $15,000; PV of OA =?

$15,000 $15,000 $15,000 $15,000 $15,000 $15,000 $15,000

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

1. 1 2 3  6 7 8 9

1 Using PV.2 factor tables

Formula:

PV of OA = R (PVF – OAn, i)

PV of OA = $15,000 (PVF – OA9, 11%)

PV of OA = $15,000 (5.53705)

PV of OA = $83,056

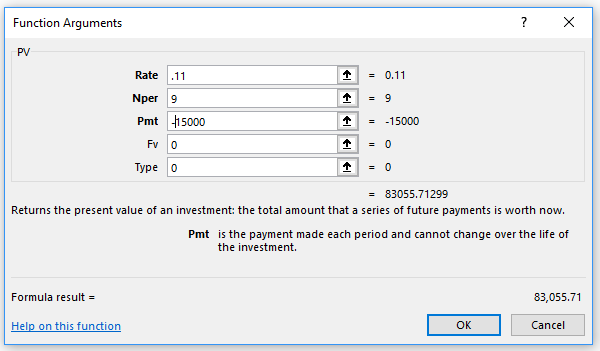
The fair value of the note under IFRS 13 is $83,056.

2 Using a financial calculator

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 83,055,71 |
| I | 11% |
| N | 9 |
| PMT | $ (15,000) |
| FV | 0 |
| Type | 0 |

**PROBLEM 3.6 (CONTINUED)**

1. Using Excel



Result: $83,055.71

b.

Notes Receivable 83,055.71

Loss on Disposal of Land 6,944.29

Land 90,000.00

c.

Cash 15,000.00

Notes Receivable 5,863.87

Interest Revenue1 9,136.13

1($83,055.71 x 11%)

LO 1,3 BT: AP Difficulty: M Time: 45 min. AACSB: None CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.7** |  |

1. 1. Purchase:

Time diagrams:

Instalments

i = 10%; n = 5; R = $350,000; PV of OA =?

$350,000 $350,000 $350,000 $350,000 $350,000

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |

0 1 2 3 4 5

Occupancy costs

i = 10%; n = 12; R = $56,000; PV of OA =?

$56,000 $56,000 $56,000 $56,000 $56,000 $56,000

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

0 1 2 9 10 11 12

Salvage Value

i = 10%; n = 12; FV = $500,000; PV =?

FV = $500,000

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

0 1 2 9 10 11 12

**PROBLEM 3.7 (CONTINUED)**

1. 1. (Continued)

Formula for instalments:

PV of OA = R (PVF – OAn, i)

PV of OA = $350,000 (PVF – OA5, 10%)

PV of OA = $350,000 (3.79079)

PV of OA = $1,326,777

Formula for occupancy costs:

PV of OA = R (PVF – OAn, i)

PV of OA = $56,000 (PVF – OA12, 10%)

PV of OA = $56,000 (6.81369)

PV of OA = $381,567

Formula for salvage value:

PV = FV (PVFn, i)

PV = $500,000 (PVF12, 10%)

PV = $500,000 (0.31863)

PV = $159,315

Present value of net purchase costs:

|  |  |
| --- | --- |
| Down payment | $ 400,000 |
| Instalments | 1,326,777 |
| Occupancy costs | 381,567 |
| Total costs | 2,108,344 |
| Less: Salvage value | 159,315 |
| Net costs | $1,949,029 |

**PROBLEM 3.7 (CONTINUED)**

1. (Continued)

2. Lease.

Time diagrams: Lease payments

i = 10%; n = 12; R = $270,000; PV of AD =?

$270,000 $270,000 $270,000 $270,000 $270,000

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

0  1 2 10 11 12

Interest lost on the deposit

i = 10%; n = 12; R = $10,000; PV of OA =?

$10,000 $10,000 $10,000 $10,000 $10,000

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

0 1 2 10 11 12

Formula for lease payments:

PV of AD = R (PVF – ADn, i)

PV of AD = $270,000 (PVF – AD12, 10%)

PV of AD = $270,000 (7.49506) Table A.5

PV of AD = $2,023,666

As given in the problem, use a regular annuity factor Table PV.2 for 11 periods at 10% and add first payment of $270,000

PV of OA = R (PVF – OAn, i)

PV of OA = $270,000 (PVF – OA11, 10%)

PV of OA = $270,000 x 6.49506

PV of OA = $1,753,666 + $270,000

= $2,023,666

**PROBLEM 3.7 (CONTINUED)**

a. (continued)

Formula for interest lost on the deposit:

Interest lost on the deposit per year = $100,000 (10%) = $10,000

PV of OA = R (PVF – OAn, i)

PV of OA = $10,000 (PVF – OA12, 10%)

PV of OA = $10,000 (6.81369)

PV of OA = $68,137\*

Cost for leasing the facilities = $2,023,666 + $68,137 = $2,091,803

b. Dunn Inc. should purchase the facilities because the present value of the costs for purchasing the facilities, $1,949,029, is less than the present value of the costs for leasing the facilities, $2,091,803.

Where the difference in cost is small between alternatives, particularly over a long period of time, other qualitative factors should also be considered.

LO 1,3 BT: AP Difficulty: M Time: 35 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.8** |  |

1. 1. Purchase:

Calculation of instalment costs:

Using a financial calculator

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 1,326,775.37 |
| I | 10% |
| N | 5 |
| PMT | $ (350,000) |
| FV | 0 |
| Type | 0 |

Calculation for occupancy costs:

Using a financial calculator

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 381,566.74 |
| I | 10% |
| N | 12 |
| PMT | $ (56,000) |
| FV | 0 |
| Type | 0 |

Calculation for salvage value:

Using a financial calculator

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ (159,315.41) |
| I | 10% |
| N | 12 |
| PMT | 0 |
| FV | $500,000 |
| Type | 0 |

**PROBLEM 3.8 (CONTINUED)**

1. 1. (Continued)

Present value of net purchase costs:

|  |  |
| --- | --- |
| Down payment | $ 400,000.00 |
| Instalments | 1,326,775.37 |
| Occupancy costs | 381,566.74 |
| Total costs | 2,108,342.11 |
| Less: Salvage value | 159,315.41 |
| Net costs | $1,949,026.70 |

1. Lease.

Calculation of lease payments:

Using a financial calculator

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 1,753,666.47 |
| I | 10% |
| N | 11 |
| PMT | $ (270,000) |
| FV | 0 |
| Type | 0 |

Add $1,753,666.47 + $270,000.00 = $2,023,666.47

Calculation for interest lost on the deposit:

Using a financial calculator

|  |  |  |
| --- | --- | --- |
| PV | ? | Yields $ 68,136.92 |
| I | 10% |
| N | 12 |
| PMT | $ (10,000) |
| FV | 0 |
| Type | 0 |

Cost for leasing the facilities = $2,023,666.47 + $68,136.92 = $2,091,803.39

**PROBLEM 3.8 (CONTINUED)**

b. Dunn Inc. should purchase the facilities because the present value of the costs for purchasing the facilities is less than the present value of the costs for leasing the facilities.

Where the difference in cost is small between alternatives, particularly over a long period of time, other qualitative factors should also be considered.

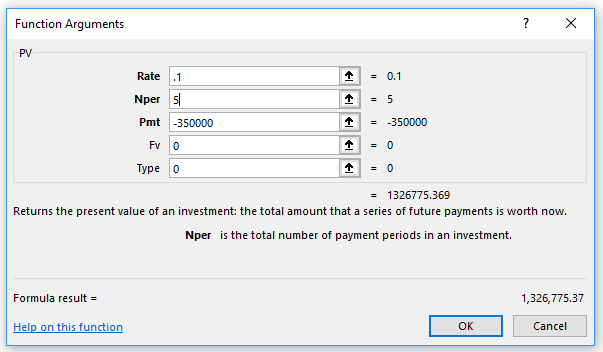
LO 1,3 BT: AP Difficulty: M Time: 35 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

|  |  |  |
| --- | --- | --- |
|  | **PROBLEM 3.9** |  |

1. 1. Purchase:

Calculation of instalment costs:

Using Excel functions:



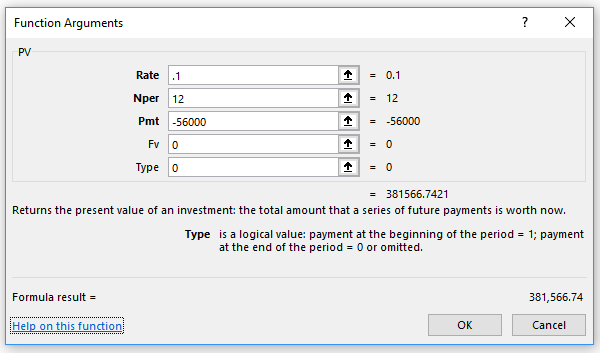
Result: $1,326,775.37

**PROBLEM 3.9 (CONTINUED)**

1. 1. (Continued)

Calculation for occupancy costs:

Using Excel functions:



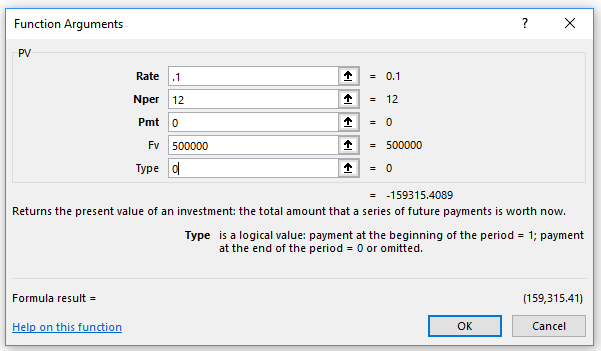
Result: $381,566.74

**PROBLEM 3.9 (CONTINUED)**

1. 1. (Continued)

Calculation for salvage value:

Using Excel functions:



Result: ($159,315.41)

Present value of net purchase costs:

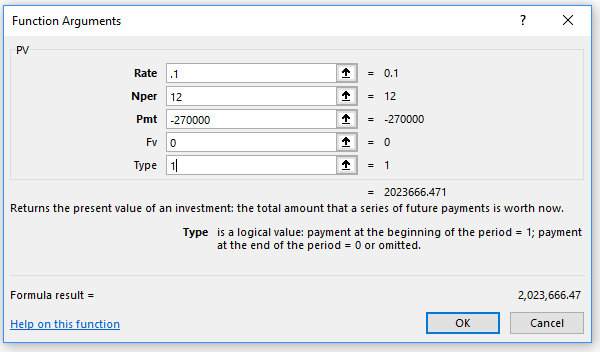
|  |  |
| --- | --- |
| Down payment | $ 400,000.00 |
| Instalments | 1,326,775.37 |
| Occupancy costs | 381,566.74 |
| Total costs | 2,108,342.11 |
| Less: Salvage value | 159,315.41 |
| Net costs | $1,949,026.70 |

**PROBLEM 3.9 (CONTINUED)**

1. (Continued)
2. Lease.

Calculation of lease payments:

Using Excel functions:

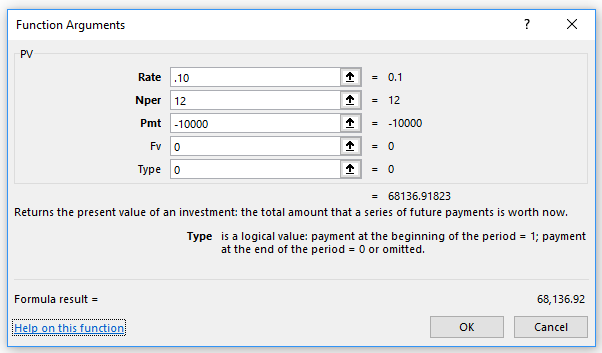


Result: $2,023,666.47

**PROBLEM 3.9 (CONTINUED)**

1. 2. (Continued)

Calculation for interest lost on the deposit:

Using Excel functions:

Result: $68,136.92

Cost for leasing the facilities = $2,023,666.47 + $68,136.92 = $2,091,803.39

b. Dunn Inc. should purchase the facilities because the present value of the costs for purchasing the facilities is less than the present value of the costs for leasing the facilities.

Where the difference in cost is small between alternatives, particularly over a long period of time, other qualitative factors should also be considered.

LO 1,3 BT: AP Difficulty: M Time: 35 min. AACSB: Analytic CPA: CPA: cpa-t001 cpa-t005 CM: Reporting and Finance

**CASES**

See the Case Primer on the Student Website as well as the summary case primer in the front of the text. Note that the first few chapters of the text lay the foundation for financial reporting decision-making. Therefore, the cases in the first few chapters (1-5) are shorter with less depth. As such, they may not cover all aspects of a full-blown case analysis. The solutions to these cases are based on the conceptual framework and not a specific GAAP such as ASPE or IFRS.

**CA 3-1 BRANSON RESTAURANTS**

Branson Restaurants reports under IFRS as noted in the case. The company can remeasure the restaurant to the lower of carrying value and fair value less costs to sell in its year-end financial statements as long as the asset is being held to sell.

Investors in Branson are deciding whether to dispose of their holdings in the company and therefore this creates a potential preparer bias to make results look better.

In measuring fair value, the company needs to determine:

1. The asset being measured: Branson has to consider the specific nature, condition, and location of the asset being measured. In this case, is the company selling principally a restaurant, including all of its tangible and intangible assets, as a going business, or is it selling the land, since the land may be of more interest to a potential purchaser that is looking to develop the property for condos. In either case, the company is looking to dispose of the restaurant, but the determination of which aspect of the restaurant would be of more interest to the purchaser may guide its choice of valuation method.
2. How the item would/could be used: as mentioned above, the restaurant could be used by a purchaser as an ongoing restaurant business or as a possible site for future condo development. The valuation of the asset is based on its highest and best use in the market, regardless of how Branson is currently using the asset.

**CA 3-1 BRANSON RESTAURANTS (Continued)**

|  |  |
| --- | --- |
| Highest and best use as a restaurant | Highest and best use as a condo development |
| * Even though the restaurant has not been doing well lately, it has historically done well and therefore can hopefully do well again * With the increasing number of condos in the area, demand for restaurants will surely increase * Perhaps the condo market will become saturated and therefore an additional development is not wise (i.e., retain the restaurant). | * Demand seems high for new condos * This is supported by the many condos being built in the area * Rezoning is legally possible according to the facts, and it is physically possible (and economically viable) to build a condo since many are doing it already |

In analyzing the highest and best use of the restaurant assets, Branson has to consider the value that the market would place on the asset. Branson may consider the best use to be as an ongoing restaurant, but potential purchasers may not view market factors for future restaurant operations in the same way and may offer a higher price for the location as a condo development.

Given the information provided, it is difficult to determine which assumption would give the highest value. Under IFRS, unless factors suggest otherwise, we may assume that the current use is the highest and best use. Therefore, the highest and best use is as a restaurant. In practice, additional factors would be considered, such as knowledgeable input from realtors, planning documents filed with the municipality, etc. The company would want to calculate alternative valuations to determine which use provides the highest valuation.

1. The market: The measurement of the fair value of the restaurant would consider the value based on the market that the company normally buys and sells in. In this case, since the asset being sold is a restaurant, Branson would be selling its business through normal business channels and would likely employ a realtor to assist with finding a buyer for either the business or the land.
2. The valuation technique: Branson can value the restaurant using either a market or an income model.

**CA 3-1 BRANSON RESTAURANTS (Continued)**

|  |  |
| --- | --- |
| Income | Market |
| * The company could use a traditional or expected cash flow approach. * The traditional approach is best suited to situations where the cash flows are fairly certain. Since the restaurant’s cash flows have declined, it may be preferable to use the expected cash flow approach. * Would have to project cash flows and discount them using a risk-free rate and assuming the cash flows are probability-weighted. * The cash flows are highly variable but could look at past cash flows (could assign probabilities looking at various scenarios such as the increased demand from new condos). Additional data would be needed. | * Could benchmark against the neighbouring restaurants by using an earnings multiples model. * Would have to adjust the market prices for the unique characteristics of this restaurant (different cuisine, location, and profitability) |

Recommendation: Either approach would be acceptable depending on how much evidence could be found to support the value and the quality of the inputs. Objective evidence would be best. The valuation of the asset would require additional disclosures in the financial statement notes since there is significant measurement uncertainty using either method. The cash flows are very subjective as are any adjustments to the market prices.

**CA 3-2 OIL PRODUCTION**

Oil Company Limited is a public company and must therefore follow IFRS. Productive assets must be assessed for possible impairment on an annual basis. An asset is impaired if the carrying amount reported on the statement of financial position is greater than its recoverable amount. The recoverable amount is the greater of the higher of value in use and fair value.

As there has been a decline in oil prices, users of financial information would expect a writedown of many properties owned by companies in the industry. This would reduce the concern for bias by management in recording a writedown. As the controller of the company, you are trying to ensure the financial statements are transparent.

The company must determine the highest and best use of the oil and gas property in order to measure its fair value. Would a potential purchaser value the property on the basis of the oil and gas resources (for extraction) (as is the case right now) or on the basis of some other use? The facts seem to suggest that the land has little value other than the value as an extractive property. In addition, we may use the current use (oil and gas extraction) as long as other factors do not contradict this. The company’s current use of the property may be presumed to reflect highest and best use unless there is specific evidence to the contrary.

Since the highest and best use is as an extractive property, fair value and value in use will likely be similar. In determining fair value of the property, the market would likely use the same assumptions about its potential use, thereby resulting in a fair value that would be essentially the same as value in use.

In determining the value in use, the company needs to estimate the future cash flows from the extraction and sale of oil and gas and then calculate the present value of these cash flows. In calculating the present value, the company can use the traditional approach or the expected cash flow approach. Under the traditional approach, the discount rate reflects all risks in the cash flows, but the cash flows are assumed to be certain. Under the expected cash flow approach, a risk-free discount rate is used to discount cash flows that have been adjusted for uncertainty. The expected cash flow approach would be better suited to this property since a probability weighting can be used to reflect the uncertainty in amounts to be received based on changes in the price of oil and gas.

Additional disclosures would be required in the financial statement notes since there is significant measurement uncertainty. The cash flows are very subjective given the unpredictability of oil prices. This disclosure would include the assumptions used, a sensitivity analysis (for example, if a different interest rate were used), a range of possible outcomes, and any changes to assumptions from past periods.

**RESEARCH AND ANALYSIS**

1. **RA 3-1 HUDSON’S BAY COMPANY**

Hudson’s Bay Company, February 3, 2018 financial statements were used.

1. The company states its basis of presentation in Note 2 on Significant Accounting Policies as the historical cost convention, as modified by the revaluation of financial assets and financial liabilities at fair value through the statements of loss.

|  |  |  |
| --- | --- | --- |
| **ELEMENT** | **BASIS OF MEASUREMENT** | **MEASUREMENT CATEGORIZATION** |
| Trade and other receivables | Amortized cost less allowance for impairment. | Hybrid measure – cost-based in general, but impairment requires current value measures |
| Inventories | Lower of cost and net realizable value. | Hybrid measure – cost-based in general, but impairment requires current value measures |
| Property, plant and equipment and intangible assets | Cost less accumulated depreciation and accumulated impairment losses. For finance lease assets, see below. | Hybrid measure – cost-based in general, but impairment requires current value measures |
| Investments in joint ventures | Equity method where the investment is adjusted to recognize profit or loss of the joint venture, adjusted for impairments. | Hybrid measure – impairment requires current value measures |
| Finance leases | Present value of the minimum lease payments amortized. | Cost-based measure |
| Trade payables | Amortized cost | Cost-based measure |
| Loans and borrowings | Amortized cost | Cost-based measure |
| Provisions | Present value of management’s best estimate of expenditure required to settle the obligation. | Current value using an income model. |

1. **RA 3-1 HUDSON’S BAY COMPANY (Continued)**
2. The company assesses impairment of property, plant and equipment by examining the recoverable amount as the higher of fair value less costs of disposal and value in use. Value in use is determined by estimating future cash flows using approved budgets and forecasts. The growth rate for future periods is determined by considering future opportunities and risks. To calculate fair value less costs of disposal, the company receives independently appraised determinations of fair value.
3. The warrants’ fair value is categorized as Level 2, which means that fair value measurement is accomplished using inputs other than quoted prices included within Level 1 that are either directly or indirectly observable. The warrants are valued using the Black-Scholes option pricing model utilizing inputs including maturity, dividend yield, share price, and volatility.
4. The Note 15 disclosure on pensions and employee benefits provides sensitivity analysis of the impact of changes in various assumptions underlying the defined pension obligation. Actual experience may result in changes in a number of key assumptions simultaneously, although it is unlikely that all factors would change in the same direction that would increase defined pension obligations simultaneously. The note does clarify that changes in one fact may result in changes in another, which could amplify or reduce the impact of the assumptions. The cumulative negative impact of changes in assumptions, in all three types of plans is as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| (millions of Canadian dollars) | Canadian Plans | U.S. Pension Plans | European Pension Plans |
| Health care trend rate  - Effect of a 1% increase | 2 | N/A | N/A |
| Discount rate  – Effect of a 1% decrease | 82 | 12 | 111 |
| Rate of compensation/ inflation  - Effect of a 1% increase | 5 | N/A | N/A |
| Pensions-in payment increase rate  - Effect of a 0.25% increase | N/A | N/A | 18 |
| Life expectancy  - Effect of a 1 year increase | 23 | 4 | N/A |
| Total | 112 | 16 | 119 |

The worst-case scenario would be a cumulative increase of $247 ($112 + $16 + $119) million over the defined pension obligation of $1,975 or an increase of 12.5%.

1. **RA 3-2 MAPLE LEAF FOODS INC.**

Maple Leaf Foods Inc., December 31, 2017 financial statements were used.

1. The company’s biological assets consist of hogs, poultry, and eggs. The hogs and poultry are separated into two categories: parent stock and commercial stock. Parent stock represents animals held and bred for the purpose of generating commercial stock and to replace parent stock. Commercial stock is held for the purposes of further processing or eventual sale. The commercial stock is measured at fair value, whereas the parent stock is measured at cost less accumulated depreciation and any impairment losses.

Commercial stock falls under IAS41, Agriculture, and is measured on a fair value basis. Fair value can be determined using the market comparison approach to determine the fair value of its commercial hog stock. The valuation model is based on the market price of hog stock of similar age, weight, breed, and genetic make-up.

Commercial poultry stock is valued at cost as an indicator of fair value in the cases where little biological transformation has taken place since initial cost occurrence or when the impact of the biological transformation on price is not expected to be material.

Parent stock of hogs and poultry are valued at cost less accumulated depreciation. No active liquid market exists for parent stock as they are rarely sold. This means that fair value information for parent stock is not available. IAS41 specifies that when fair value cannot be measured reliably, the biological asset is valued at cost less accumulated depreciation. In addition, parent stock produce saleable products and are conceptually similar to “bearer plants” such as tea bushes, grapevines, and rubber trees because they produce saleable products. They are treated like property, plant, and equipment.

1. The fair value of the commercial hog stock can be determined using the market comparison approach. The valuation model is based on the market price of hog stock of similar age, weight, breed, and genetic make-up. The model is based on the U.S. dollar market price per cut weight and adjusted for foreign exchange, conversion from pounds to kilograms, and specific significant unobservable inputs, including a quality index adjustment and a market conversion factor. The quality index adjustment is a value adjustment based on the relative quality of a processed hog based on the lean yield (being the ratio between muscle and fat content) and total weight. Quality adjustments range from 6.3% to 7.3%. A higher (lower) quality adjustment percentage will result in an increase (decrease) to the fair market value of the commercial hog stock. The market conversion factor is a market adjustment used to discount the formula from a U.S. market price to a Canadian pricing model.

# 3. RA 3-2 MAPLE LEAF FOODS INC. (CONTINUED)

The market conversion factor experiences minimal fluctuation. A higher (lower) market conversion factor will result in an increase (decrease) to the fair market value of the commercial hog stock.

Because there are significant unobservable inputs, the fair value measures of commercial hog stock have been categorized as a Level 3 fair value.

1. The change in fair value of commercial hog and poultry stock is shown as part of Cost of Goods Sold. IAS 41 states that the change must be included in profit or loss for the period but does not indicate specifically in what part of the statement of earnings to disclose the gain or loss. Industry practice is to include the gain or loss as part of Cost of Goods Sold, as part of inventory costs.
2. Inventories are valued at the lower of cost and net realizable value, with cost being determined substantially on a first-in, first-out basis. The cost of inventory includes direct product costs, direct labour, and an allocation of variable and fixed manufacturing overhead, including depreciation.

In the case of commercial hog and poultry stock, the fair value basis to cost the biological assets forms the direct product costs. The biological assets are transferred into inventory at fair value less costs to sell at the point of delivery. Additional processing in the form of labour, product costs, and overhead are added to complete the products the company sells such as wieners and sausages, sliced meats, and fresh products. Under the cost principle, the cost is the fair value at the time the transaction took place, in this case, when the asset was re-classified from a biological asset to inventory.

**4. RA 3-3 WARRANTY COST MEASUREMENT**

The following material was extracted from “Warranty Analytics - Increase Product quality, Customer satisfaction & Brand perception” by Sandeep Raut, May 24, 2012 on the website Data Science Central.

https://www.datasciencecentral.com/profiles/blogs/warranty-analytics-increase-product-quality-customer-satisfaction

“Industry numbers shows that warranty costs range from 2% to 6% of the company’s revenues. Predicting these warranty costs is an important step for successfully managing the business.  If manufacturers reserve too much money, then they lose opportunities to grow the business because they end up with less cash.  If they set aside too little money, then they lose opportunities because they have to keep adding to the warranty reserves funds.

Let us see some quick definitions of warranty:

* Base warranty – original warranty coverage provided by manufacturer at no extra cost, since it is included in the product price.
* Extended warranty – this comes into effect after the base warranty expires.
* Warranty reserves – amount of money set aside by manufacturer for the purpose of servicing the warranty claims. This is based on the forecasted warranty costs.

In the automotive industry, warranty generally guarantees free repairs or replacements subject to both age of the car and mileage. Warranty Analytics is the integration of warranty claims data with customer, product, sales, and geographic information, so companies can accelerate detection of failures and reduce time to correction.    
  
It can help in significantly improving the early warnings of parts failures based on customer complaints and failure patterns, combining structured data with un-structured data (such as call centre records) to give alerts and information about developing trends that would have gone unnoticed earlier. By identifying warranty-related issues early, companies can save thousands of dollars in both repair costs and customer retention because issues are proactively addressed before they become significant, costly problems.

Root cause identification of parts failures is the biggest challenge in the industry today.  70% of annual warranty expenses are consumed by repetitive and chronic problems.  Prioritization of these root causes helps companies calculate how much it will cost if nothing is done. This allows them to determine the best course of action and associated costs, as well as any potential effect on customer satisfaction.

Managing warranty costs is an enterprise-wide challenge, impacting multiple departments, including quality, product engineering, customer service, finance, and purchase.

**5. RA 3-3 WARRANTY COST MEASUREMENT (Continued)**

Typical areas of applying Analytics on Warranty data involves:

* Data mining to identify the patterns of claims
* Text mining to identify problem areas and fixing them, instead of technicians trying to select from hundreds of warranty categories
* Predicting the expected number of claims or cost of claims
* Predicting fraudulent claims
* Investigating the association between different types of claims
* Identifying issues before they become showstoppers
* What-if analysis such as if we increase the mileage what will be the impact on warranty costs”

As the article above indicates, data collected from the Internet of things would refer to various devices included in the vehicle that would be sent back to the manufacturer. In estimating warranty costs, manufacturers need a model. Data analytics would provide inputs to the estimation model. Since the information is generated internally from the manufacturer’s own products and customers, the quality of the information is higher on the fair value hierarchy, either Level 1 or 2 depending on the type of information gathered and how it is interpreted. The data could be used to estimate the timing of future cash flows and help the company determine if the traditional or expected cash flow approach is better suited by providing data on the timing and certainty of future cash flows to service the warranties. Data analytics also shortens the timeframe in which the data is available. Historically, manufacturers had to obtain the data from service centres based on warranty claims. With data analytics, the information is obtained as the vehicles are used and the type and quantity of information is greater. This allows the company to improve its predictive abilities to quantify warranty costs.

**6. RA 3-4 use of data analytics**

From TripAdvisor’s website: “TripAdvisor, the world's largest travel site, enables travelers to unleash the full potential of every trip. With over 600 million reviews and opinions covering the world's largest selection of travel listings worldwide – covering approximately 7.5 million accommodations, airlines, attractions, and restaurants -- TripAdvisor provides travelers with the wisdom of the crowds to help them decide where to stay, how to fly, what to do and where to eat. TripAdvisor also compares prices from more than 200 hotel booking sites so travelers can find the lowest price on the hotel that's right for them.”

TripAdvisor provides users with travel information. The company’s revenues come from advertising for participating merchants and sale of its data collected from users of the site to assist merchants with advertising. Participating merchants can use data generated from the TripAdvisor website to help analyze demand and create more accurate earnings forecasts that are then used by financial analysts.

Financial analysts obtain industry information from various sources, such as industry specific ratios and trends from Standards and Poors, Bloomberg, and Thomson Reuters, public company filings, and government agencies. Financial analysts analyzing the hospitality industry can also use reports produced by TripAdvisor to examine trends in the hospitality industry.

In analyzing the financial information for a particular company, a financial analyst would be able to see the rating and comments on the TripAdvisor website. As externally generated evidence of the company’s success, a financial advisor would likely classify this type of information as Level 3 with unobservable inputs. Numerous reports have circulated of bias in online reviews of businesses, either by businesses themselves, or from competitors posting negative reviews (or positive).

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