

# Solution

Term: **Fall** Year: **2011**

<b>Student Name</b>	<b>Student ID Number</b>
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Date of Exam	Thursday, December 15, 2011
Time Period	Start time: 9:00 am      End time: 11:30 am
Duration of Exam	2.5 hours
Number of Exam Pages (including this cover sheet)	
Exam Type	Special Materials
Additional Materials Allowed	Cordless calculators may be used. The calculator must be standalone with no communication or data storage features.

## Marking Scheme:

<b>Question</b>	<b>Score</b>	<b>Question</b>	<b>Score</b>
1 (8 marks)		6 (12 marks)	
2 (11 marks)		7 (8 marks)	
3 (15 marks)		8 (32 marks)	
4 (12 marks)			
5 (12 marks)		Total (110 marks)	

**Question 1** (8 marks)

The records for Russell Corporation show the following inventory transactions for the month of December 2011:

Date	Transactions	Number of Units	Unit Cost
December 1	Beginning inventory	50	\$200
December 10	Purchase	80	\$220
December 17	Purchase	40	\$250

Russell Corporation sold 100 units during December. The company is able to track each unit using a bar code. Russell Corporation knows that 40 of the units sold came from the beginning inventory, 50 units came from the December 10 purchase and the remaining units sold came from the December 17 purchase. Russell Corporation uses a periodic inventory system.

**Required:**

Complete the following table:

	Number of Units	Inventory Method		
		FIFO	Weighted Average	Specific Identification
Cost of Sales	<b>100</b>	<b>\$21,000</b>	<b>\$22,118</b>	<b>\$21,500</b>
Ending Inventory	<b>70</b>	<b>\$16,600</b>	<b>\$15,482</b>	<b>\$16,100</b>

**FIFO:**

**Cost of sales:**  $50 * \$200 + 50 * \$220 = \$10,000 + \$11,000 = \$21,000$

**Ending inventory:**  $30 * \$220 + 40 * \$250 = \$6,600 + \$10,000 = \$16,600$

**Weighted Average:**

**Average cost** =  $(50 * \$200 + 80 * \$220 + 40 * \$250) / 170 = \$37,600 / 170 = \$221.18 / \text{unit}$

**Cost of sales:**  $100 * \$221.18 / \text{unit} = \$22,117.65$

**Ending inventory:**  $70 \text{ units} * \$221.18 / \text{unit} = \$15,482.35$

**Specific Identification:**

**Cost of sales:**  $40 * \$200 + 50 * \$220 + 10 * \$250 = \$8,000 + \$11,000 + \$2,500 = \$21,500$

**Ending inventory:**  $10 * \$200 + 30 * \$220 + 30 * \$250 = \$2,000 + \$6,600 + \$7,500 = \$16,100$

**Question 2** (11 marks)

Assume that you are an accountant at Robson Incorporated. One of your responsibilities is to prepare the bank reconciliation for December, 2011. You obtain the following information from the company records and the bank statement:

- December 31 balance shown on the bank statement was \$31,510
- The bank statement showed a total of \$45,250 of cheques cleared during December
- The bank statement showed deposits during the month totaling \$41,370
- The bank reported one NSF cheque in the amount of \$320 that had been received from a customer of Robson Incorporated
- The December bank statement showed service charges of \$80 and interest revenue of \$35
- The bank collected an outstanding note (on behalf of Robson Incorporated) in the amount of \$4,200 (including interest of \$220) from Thompson Inc. which was not recorded in the company records
- The November bank reconciliation listed outstanding cheques of \$5,640 and a deposit in transit for \$2,190
- December 31 cash balance in the records of Robson Incorporated was \$27,908
- Company records show deposits for the month of \$43,610
- Company records show that a total of \$43,330 of cheques were written in December
- A cheque written to Vance Company in the amount of \$358 was incorrectly recorded in the Robson Cash Disbursement Journal as \$835

**Required:**

Prepare the bank reconciliation using the following table:

Robson Incorporated Bank Reconciliation December 31, 2011			
<u>Company's Books</u>		<u>Bank Statement</u>	
Ending cash balance per books	<b>\$27,908</b>	Ending cash balance per bank statement	<b>\$31,510</b>
Additions		Additions	
<b>Interest revenue</b>	<b>35</b>	<b>Deposits in transit</b>	<b>4,430</b>
<b>Collection of note</b>	<b>4,200</b>	<b>(\$43,610 + 2,190 - 41,370)</b>	
<b>Error in cheque</b>	<b>477</b>		
Deductions		Deductions	
<b>NSF cheque</b>	<b>(320)</b>	<b>Outstanding cheques</b>	<b>(3,720)</b>
<b>Service charges</b>	<b>(80)</b>	<b>(\$43,330 + 5,640 - 45,250)</b>	
Ending correct cash balance	<b>\$32,220</b>	Ending correct cash balance	<b>\$32,220</b>

**Question 3 (15 marks)**

Condensed financial data for Robinson Limited for December 31, 2010 and 2011 follow:

**Comparative Statement of Financial Position:**

	<u><b>2010</b></u>	<u><b>2011</b></u>
Cash balance	\$36,250	\$38,700
Trade receivables	43,790	48,210
Inventory	52,120	49,880
Equipment	146,800	157,400
Accumulated depreciation	<u>(53,600)</u>	<u>(48,900)</u>
	<u>\$225,360</u>	<u>\$245,290</u>
Trade payables	\$21,650	\$18,490
Income tax payable	5,240	7,770
Long-term notes payable	70,000	80,000
Common shares	80,000	85,000
Retained earnings	<u>48,470</u>	<u>54,030</u>
	<u>\$225,360</u>	<u>\$245,290</u>

**Income Statement for 2011:**

Sales		\$425,500
Operating expenses (excluding depreciation)	\$366,220	
Depreciation expense	15,400	
Loss on sale of equipment	<u>3,500</u>	<u>385,120</u>
Income before income taxes		40,380
Income tax expense		<u>12,110</u>
Net income		<u>\$28,270</u>

During the year, Robinson Limited purchased new equipment in exchange for a long-term note payable in the amount of \$40,000. The company sold old equipment for cash.

**Required:**

Prepare the statement of cash flows for the Robinson Limited for 2011 using the indirect method.  
*Please use the table on the next page to complete this question.*

Robinson Limited  
Statement of Cash Flows  
**For the Year Ended December 31, 2011**

Operating Activities:

<b>Net income</b>	<b>\$28,270</b>	
<b>Add (deduct) items not affecting cash</b>		
<b>Depreciation expense</b>	<b>15,400</b>	
<b>Loss on sale of equipment</b>	<b>3,500</b>	
<b>Increase in trade receivables</b>	<b>(4,420)</b>	
<b>Decrease in inventory</b>	<b>2,240</b>	
<b>Decrease in trade payables</b>	<b>(3,160)</b>	
<b>Increase in income tax payable</b>	<b>2,530</b>	
Net cash flow from operating activities		<b>\$44,360</b>

Investing Activities:

<b>Sale of equipment</b>	<b>\$5,800</b>	
Net cash flow from investing activities		<b>\$5,800</b>

Financing Activities

<b>Repayment of long-term note payable</b>	<b>(\$30,000)</b>	
<b>Issue common shares</b>	<b>5,000</b>	
<b>Payment of cash dividends</b>	<b>(22,710)</b>	
Net cash flow from financing activities		<b><u>(47,710)</u></b>
<b>Increase in cash</b>		<b>2,450</b>
<b>Cash balance on December 31, 2010</b>		<b><u>36,250</u></b>
Cash balance on December 31, 2011		<b><u>\$38,700</u></b>

Non-cash Investing and Financing Activities

**Purchase of equipment for \$40,000 in exchange for long-term note payable**

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**Question 4 (12 marks)**

Answer the following independent questions.

- A) Phillips Company issued a \$1,000,000 bond on November 1, 2011. The bond is due in 10 years, has an interest rate of 5% and pays interest annually. The market interest rate is 4%. The company uses the effective interest rate method of amortization. Calculate the issue price of the bond.

**Using formula:**

<b>Principal:</b> $\$1,000,000 * PV(n=10,i=4\%) = \$1,000,000 * 0.675564$	<b>\$675,564.17</b>
<b>Interest:</b> $\$50,000 * PVA(n=10,i=4\%) = \$50,000 * 8.110896$	<b><u>405,544.79</u></b>
<b>Issue price</b>	<b><u>\$1,081,108.96</u></b>

**Using tables:**

<b>Principal:</b> $\$1,000,000 * PV(n=10,i=4\%) = \$1,000,000 * 0.676$	<b>\$676,000</b>
<b>Interest:</b> $\$50,000 * PVA(n=10,i=4\%) = \$50,000 * 8.111$	<b><u>405,550</u></b>
<b>Issue price</b>	<b><u>\$1,081,550</u></b>

- B) On January 1, 2011, Lim Company signed a mortgage note for \$1,000,000 at 8 percent interest for a term of 4 years. Mortgage payments are made quarterly. Each mortgage payment is a blend of interest on the unpaid amount and a partial repayment of the principal. Calculate the amount of each mortgage payment.

**Using formula:**

$$\begin{aligned} \$1,000,000 &= \text{payment} * PVA(n=16,i=2\%) = \text{payment} * 13.577709 \\ \text{Payment} &= \$73,650.13 \end{aligned}$$

**Using tables:**

$$\begin{aligned} \$1,000,000 &= \text{payment} * PVA(n=16,i=2\%) = \text{payment} * 13.578 \\ \text{Payment} &= \$73,648.55 \end{aligned}$$

- C) Markle Company issued a \$1,000,000 bond on January 1, 2011. The bond is due in 10 years and has an interest rate of 7%. Interest is paid annually. The market interest rate is 6%. The issue price was \$1,073,601. The company uses the effective interest rate method of amortization. Complete the following table.

<b>Date</b>	<b>Interest Payment</b>	<b>Interest Expense</b>	<b>Amortization of Discount or Premium</b>	<b>Book Value</b>
January 1, 2011	----	----	----	\$1,073,601
December 31, 2011	<b>\$70,000</b>	<b>\$64,416.06</b>	<b>\$5,583.94</b>	<b>\$1,068,017.06</b>

- D) Libby Incorporated borrowed \$100,000 from the bank on December 10, 2011, by signing a note. The note is due in 90 days and the interest rate is 8%. Libby Incorporated's fiscal year end is December 31. Prepare the adjusting entry required at December 31, 2011.

<b>Interest Expense</b>	<b>\$460.27</b>	
<b>Interest Payable</b>		<b>\$460.27</b>
<b>\$100,000 * 8% * 21/365</b>		

**Question 5** (12 marks)

Answer the following independent questions.

- A) Laiken Corporation operates a transit service. The company purchased a new passenger van on January 2, 2011, at a cost of \$75,000. The truck has an estimated useful life of 8 years and the company expects to drive the van for 400,000 kilometers. The salvage value is expected to be \$10,000. Actual kilometers driven in 2011 were 65,000 and 55,000 kilometers were driven in 2012. Calculate the amortization expense for **2011** and **2012** under each of the following methods. Assume that the company uses a 20% declining balance rate.

Year	Straight-line method	Units of production method	Declining balance method
<b>2011</b>	<b>\$8,125</b>	<b>\$10,562.50</b>	<b>\$15,000</b>
<b>2012</b>	<b>\$8,125</b>	<b>\$8,937.50</b>	<b>\$12,000</b>

**Straight-line method:**  $(\$75,000 - \$10,000) / 8 \text{ years} = \$8,125 \text{ per year}$

**Units of production method:**  $(\$75,000 - \$10,000) / 400,000 \text{ km} = 0.1625 / \text{km}$

**2011:**  $65,000 \text{ km} * 0.1625 / \text{km} = \$10,562.50$

**2012:**  $55,000 \text{ km} * 0.1625 / \text{km} = \$8,937.50$

**Declining balance method:**

**2011:**  $\$75,000 * 20\% = \$15,000$

**2012:**  $(\$75,000 - \$15,000) * 20\% = \$60,000 * 20\% = \$12,000$

- B) The financial statements for Huang Incorporated shows the following information:

	<u>2011</u>	<u>2010</u>
Trade receivables, net of allowances of \$160 and \$290	\$5,900	\$6,300
Net credit sales	31,000	32,000
Bad debt expense	320	340

Calculate the cash collected from customers during 2011.

**Trade receivables (gross): 2011: \$6,060      2010: \$6,590**

**Write-off of bad debts = beginning balance + bad debt expense – ending balance**  
**= \$290 + 320 – 160**  
**= \$450**

**Cash collected = beginning balance + sales – write-offs – ending balance**  
**= \$6,590 + 31,000 – 450 – 6,060**  
**= \$31,080**



C) The shareholders' equity section of the Balance Sheet of Kraft Limited showed the following on January 1, 2011:

Common shares (authorized 300,000 shares, outstanding 50,000 shares)	\$500,000
Retained earnings	775,000

The following events occurred during 2011:

Mar. 1: Issued 10,000 shares at a price of \$15 per share

Apr. 15: Issued a cash dividend of \$1.00 per share

Jun. 1: Issued a 10% stock dividend; the current market price is \$18 per share

Oct 15: Declared a 2-for-1 stock split; the current market price is \$20 per share

Dec. 31: Net income for the year was \$115,000

Complete the following table to show the cumulative balances after each event has been recorded:

Date	Common Shares		Retained Earnings
	Number of shares outstanding	Dollar Amount	Dollar Amount
Jan. 1	50,000	\$500,000	\$775,000
Mar. 1	<b>60,000</b>	<b>\$650,000</b>	<b>\$775,000</b>
Apr. 15	<b>60,000</b>	<b>\$650,000</b>	<b>\$715,000</b>
Jun. 1	<b>66,000</b>	<b>\$758,000</b>	<b>\$607,000</b>
Oct. 15	<b>132,000</b>	<b>\$758,000</b>	<b>\$607,000</b>
Dec. 15	<b>132,000</b>	<b>\$758,000</b>	<b>\$722,000</b>

**June 1: Stock dividend = 6,000 shares \* \$18 = \$108,000**

**Question 6** (12 marks)

Answer the following independent questions.

A) Gunz Corporation has the following shares outstanding during 2011:

Preferred shares: \$2, cumulative, 10,000 shares outstanding

Preferred shares: \$3, non-cumulative, 15,000 shares outstanding

Common shares: 50,000 shares outstanding

Gunz Corporation began operations in 2009. Retained earnings at the end of 2011 are \$345,000. No dividends were paid in 2009 or 2010. The board of directors declared a cash dividend of \$175,000 in 2011. Complete the following table showing the amount paid in 2011 to each class of shareholder:

	Dividends Paid in 2011
Cumulative preferred shares	<b>\$60,000</b>
Non-cumulative preferred shares	<b>\$45,000</b>
Common shares	<b>\$70,000</b>

**Cumulative preferred shares: 10,000 shares \* \$2 \* 3 years = \$60,000**

**Non-cumulative preferred shares: 15,000 shares \* \$3 = \$45,000**

**Common shares: \$175,000 – (60,000 + 45,000) = \$70,000**

B) Geoffrey Corporation purchased a delivery truck on May 1, 2008, that had an original cost of \$80,000 and an estimated residual value of \$10,000. The useful life was expected to be 7 years and straight-line depreciation is used. Geoffrey Corporation sold the machine for \$40,000 cash on December 1, 2011. The company has a December 31 year end. Calculate the gain or loss on sale of the machine.

**Depreciation expense = (\$80,000 – 10,000) / 7 years = \$10,000 / year**

**Ownership = 8 months in 2008 + 2009 + 2010 + 11 months in 2011 = 3 years, 7 months**

**Accumulated depreciation = \$10,000 \* 3 7/12 = \$35,833.33**

**Net book value = \$80,000 - 35,833.33 = \$44,166.67**

**Loss on sale = \$40,000 - 44,166.67 = \$4,166.67**

- C) Douglas Ltd uses the aging method to estimate bad debt expense. The accountant prepared the following aging of the accounts receivable at year end:

	Amount	Bad Debt Rate
Not yet due	\$165,600	2%
1-30 days past due	52,200	5%
31-60 days past due	33,800	10%
More than 60 days past due	15,500	30%
Total	\$267,100	

The current balance in the Allowance for Doubtful Accounts is \$850 (debit). Determine the amount to be recorded as bad debt expense for the year.

	Amount	Bad Debt Rate	Estimated Uncollectible
<b>Not yet due</b>	<b>\$165,600</b>	<b>2%</b>	<b>\$3,312</b>
<b>1-30 days past due</b>	<b>52,200</b>	<b>5%</b>	<b>2,610</b>
<b>31-60 days past due</b>	<b>33,800</b>	<b>10%</b>	<b>3,380</b>
<b>More than 60 days past due</b>	<b>15,500</b>	<b>30%</b>	<b>4,650</b>
<b>Total</b>	<b>\$267,100</b>		<b>\$13,952</b>
<b>Current balance in Allowance for Doubtful Accounts</b>			<b>850 (debit)</b>
<b>Amount to record as bad debt expense</b>			<b>\$14,802</b>

- D) Weaver Mining Company purchased a site containing a mineral deposit in 2011. The purchase price was \$820,000, and the site is estimated to contain 400,000 tons of extractable ore. Weaver constructed a building at the site, at a cost of \$500,000, to be used while the ore is being extracted. When the ore reserves are gone, the building will have no further value. Weaver mined 75,000 tons of ore in 2011. Prepare the journal entry to record depletion for 2011.

**Depletion rate (on land only) = \$820,000 / 400,000 = \$2.05 / ton**

**Depletion rate (on land and building) = (\$820,000 + 500,000) / 400,000 = \$3.30 / ton**

<b>Mineral Inventory</b>	<b>\$153,750</b>	
<b>Accumulated Depletion (or Mineral Reserves)</b>		<b>\$153,750</b>
<b>75,000 tons * \$2.05 / ton</b>		

**Or**

<b>Mineral Inventory</b>	<b>\$247,500</b>	
<b>Accumulated Depletion (or Mineral Reserves)</b>		<b>\$247,500</b>
<b>75,000 tons * \$3.30 / ton</b>		

**Question 7 (8 marks)**

**The answers to the following questions must appear in the space provided. Point form may be used.**

- A) The article “Backdating Likely More Widespread” talks about research regarding the frequency of backdating. Briefly explain the practice of “backdating.”
- **Setting an issue date for a stock option that is earlier than the actual date in which the exercise price was determined**
  - **Results in an exercise price that is lower than the market price on the true date that the option was established**
- B) Discuss the impact on the income statement of using the straight line method to amortize a bond discount compared to the effective interest method.
- **The straight line method results in equal interest expense in each year while the interest expense increases over time with the effective interest method**
  - **The interest expense is smaller with the effective interest method than the straight line method in the early years and larger in the later years**
- C) Briefly discuss the impact on income of using the lower of cost and net realizable value rule for the valuation of inventory.
- **The write-down of inventory to net realizable value will increase cost of sales and reduce income in the current year**
  - **Sale of the inventory in the subsequent year will result in a lower cost of sales and higher income compared to not using the LCNRV rule**
- D) The article “Pension Packages are Getting Fresh Attention” compares defined contribution and defined benefit pension plans. Briefly compare the two plans from the perspective of the employer.
- **Defined contribution plans provide less financial risk for the employer as the contribution to the plan is fixed regardless of plan performance**

**Question 8** (32 marks)

Question 8 consisted of 32 multiple choice questions. There was no mark penalty for incorrect answers. The answers had to be recorded on a University of Waterloo answer card.

The midterm examinations and the 2005 sample final examination provide examples of typical multiple choice questions.

## Ratios

Price-Earnings Ratio	$\frac{\text{Market Price per Share}}{\text{Earnings per Share}}$
Debt to Equity Ratio	$\frac{\text{Total Liabilities}}{\text{Total Shareholders' Equity}}$
Total Asset Turnover Ratio	$\frac{\text{Sales}}{\text{Average Total Assets}}$
Return on Assets	$\frac{\text{Profit} + \text{Interest Expense (net of tax)}}{\text{Average Total Assets}}$
Earnings per Share	$\frac{\text{Profit Available to Common Shareholders}}{\text{Average Number of Common Shares Outstanding}}$
Net Profit Margin	$\frac{\text{Profit}}{\text{Net Sales}}$
Return on Equity	$\frac{\text{Profit}}{\text{Average Shareholders' Equity}}$
Quality of Income Ratio	$\frac{\text{Cash Flow from Operating Activities}}{\text{Profit}}$
Capital Acquisition Ratio	$\frac{\text{Cash Flow from Operating Activities}}{\text{Cash Paid for Property, Plant, and Equipment}}$
Gross Profit Percentage	$\frac{\text{Gross Profit}}{\text{Net Sales}}$
Receivables Turnover Ratio	$\frac{\text{Net Sales}}{\text{Average Net Trade Receivables}}$
Average Collection Period or	$\frac{365 \text{ days}}{\text{Accounts Receivable Turnover Ratio}}$
<b>OR</b>	$\frac{\text{Average Net Trade Accounts Receivable}}{\text{Sales per Day}}$
Inventory Turnover Ratio	$\frac{\text{Cost of Sales}}{\text{Average Inventory}}$
Fixed Asset Turnover Ratio	$\frac{\text{Net Sales}}{\text{Average Net Fixed Assets}}$

Current Ratio

$$\frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Trade Payables Turnover Ratio

$$\frac{\text{Cost of Sales}}{\text{Average Accounts Payable}}$$

Average Age of Payables

$$\frac{365 \text{ days}}{\text{Trade Payables Turnover Ratio}}$$

**OR**

$$\frac{\text{Average Trade Payables}}{\text{Cost of Sales per Day}}$$

Financial Leverage Ratio

$$\frac{\text{Average Total Assets}}{\text{Average Shareholders' Equity}}$$

Times Interest Earned Ratio

$$\frac{\text{Profit before Interest and Taxes}}{\text{Interest Expense}}$$

Dividend Yield Ratio

$$\frac{\text{Dividends per Share}}{\text{Market Price per Share}}$$

Dividend Payout Ratio

$$\frac{\text{Dividends}}{\text{Net Income}}$$

Quick Ratio

$$\frac{\text{Cash} + \text{Short-Term Investments} + \text{Net Trade Receivables}}{\text{Current Liabilities}}$$

Cash Ratio

$$\frac{\text{Cash} + \text{Cash Equivalents}}{\text{Current Liabilities}}$$

Cash Coverage  
Ratio

$$\frac{\text{Cash Flows from Operating Activities before Interest and Taxes}}{\text{Interest Paid}}$$

## Present Value Tables and Formulae

$$\text{Present Value of \$1} = (1 + i)^{-n} = \frac{1}{(1 + i)^n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826	0.812	0.797
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751	0.731	0.712
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683	0.659	0.636
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621	0.593	0.567
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564	0.535	0.507
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513	0.482	0.452
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467	0.434	0.404
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424	0.391	0.361
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386	0.352	0.322
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350	0.317	0.287
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319	0.286	0.257
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290	0.258	0.229
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263	0.232	0.205
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239	0.209	0.183
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218	0.188	0.163
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198	0.170	0.146
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180	0.153	0.130
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164	0.138	0.116
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149	0.124	0.104

$$\text{Present Value of an Ordinary Annuity of \$1} = [1 - (1+i)^{-n}] / i = \frac{1 - \frac{1}{(1+i)^n}}{i}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909	0.901	0.893
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736	1.713	1.690
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487	2.444	2.402
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170	3.102	3.037
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791	3.696	3.605
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355	4.231	4.111
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868	4.712	4.564
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335	5.146	4.968
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759	5.537	5.328
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145	5.889	5.650
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495	6.207	5.938
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814	6.492	6.194
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103	6.750	6.424
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367	6.982	6.628
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606	7.191	6.811
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824	7.379	6.974
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022	7.549	7.120
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201	7.702	7.250
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365	7.839	7.366
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.818	9.129	8.514	7.963	7.469